CAMROSA WATER DISTRICT

NOTICE TO BIDDERS, CONTRACT PROPOSAL, AND SPECIFICATIONS FOR THE

Reservoir 3D Site Drainage Improvements

Specification No. PW 19-04

EUGENE F. WEST, PRESIDENT
AL E. FOX
JEFFREY C. BROWN
TIMOTHY H. HOAG
TERRY L. FOREMAN

TERRY CURSON
-DISTRICT ENGINEER-

BIDS TO BE OPENED OCTOBER 17, 2019
by 2:00 P.M.

PRICES:
ONLINE **$15.00**

CAMROSA WATER DISTRICT
7385 SANTA ROSA ROAD
CAMARILLO, CA 93012
STAFF CONTACT: (805) 482-8063

ENGINEERING DEPARTMENT

CAMROSA WATER DISTRICT

CONSTRUCTION DOCUMENTS

FOR

RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

LOCATION: 3261 Escollera Avenue (approximate)
CAMARILLO, CALIFORNIA 93012

SPECIFICATION NO.: PW 19-04

DATE: September 5, 2019

PREPARED BY:

Terry Curson
District Engineer/
Camrosa Water District

RECOMMENDED BY:

Joe Willingham
Planning & Data Systems Manager
Camrosa Water District

ENGINEERING DEPARTMENT

CAMROSA WATER DISTRICT

NOTICE TO BIDDERS, SUBCONTRACTORS, AND SUPPLIERS

Complete digital bidding documents are available at Camrosa.com. You may download the digital documents for $15.00 by inputting **Quest project # 6505227**. Please contact QuestCDN.com at (952) 233-1632 or info@questcdn.com for assistance in membership registration, downloading, and working with this digital project information.

If you discover any error or omission in the plans, specifications, or proposal, or have any question concerning the bidding documents, please contact:

Terry Curson, District Engineer
Camrosa Water District
7385 Santa Rosa Road
Camarillo, CA 93012
Telephone (805) 482-8063

Advise the person answering the phone that you have a "Bidding Question." Please do not call other staff members or consultants.

All bids must be sealed and submitted at or before 2:00 p.m., October 17, 2019, to the following:

District Engineer
Camrosa Water District
7385 Santa Rosa Road
Camarillo, CA 93012

There will be a mandatory pre-bid meeting on October 3, 2019 at 10:00 AM. Contractors shall meet at the District's Headquarters, followed by a site visit.

After the bid opening, bid results may be posted online through QuestCDN.

After a Notice to Proceed is issued to the successful bidder, all contacts should be through Terry Curson at (805) 482-8063.

NOTE: Please mark the outside of the envelope (and express shipment envelope, if applicable):

SPECIFICATION NO. PW 19-04
RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS
Bids to be opened October 17, 2019, 2:00 p.m.

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List of Appendices

CAMROSA WATER DISTRICT

ENGINEERING DEPARTMENT

NOTICE INVITING BIDS

FOR

RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

SPECIFICATION NO. PW 19-04

NOTICE INVITING BIDS

Pursuant to statute and to the authorization approved by the Board of Directors of the Camrosa Water District, NOTICE IS HEREBY GIVEN that sealed bids for the Reservoir 3D Site Drainage Improvements, Specification No. PW 19-04, will be received by the District Engineer, at Camrosa's Headquarters, 7385 Santa Rosa Road, Camarillo, California, 93012, at or before 2:00 p.m. on October 17, 2019, at which time they will be publicly opened and read at or about said hour and date by the District Engineer (or designated representative) at the above address.

SCOPE OF WORK:

The proposed Reservoir 3D Site Drainage Improvements consists of, but not limited to, the construction of a 12-inch drain pipeline and site drainage improvements. Major tasks shall include 12-inch HDPE drain pipeline, drain discharge structure, interceptor ditches and erosion fill.

The proposal shall be submitted, and the work shall be performed by a Class A State of California licensed contractor in strict conformance with Specification No. PW 19-04, on file in the District's Engineering Department.

Copies of plans and specifications may be obtained through QuestCDN online bidding service. (www.questcdn.com). Plans and specifications are free to review but cost $15.00 to download. **Quest project # 6505227**. All questions concerning the bid document should be directed to the District Engineer, Camrosa Water District, at (805) 482-8063.

All prospective bidders shall abide by the provisions of the Bid Terms and Conditions listed in the project's specifications.

The District reserves the right to retain all proposals for a period of sixty (60) days after the bid opening date for examination and comparison and to delete any portion of the work from the Contract.

The District reserves the right to determine and waive nonsubstantial irregularities in any proposal, to reject any or all proposals, to reject one part of a proposal and accept the other. The bid shall be balanced so that each bid item is priced to carry its share of the cost of the work and also its share of the contractor's overhead and profit. The District reserves the right to delete any bid item to the extent that the bid is qualified by specific limitation. An unbalanced bid shall be considered as grounds for rejecting the entire bid. The District further reserves the right to make award to the lowest responsible bidder as the interest of the District may require.

The District will not consider awarding any contract based upon any proposal submitted by any contractor and will not consent to subletting any portions of the Contract to any subcontractor located in a foreign country during any period in which such foreign country is listed by the United States Trade Representative as discriminating against U.S. firms in conducting procurements for public works projects.

In accordance with the provisions of Division 2, Part 7, Chapter 1 of the California Labor Code, the California Department of Industrial Relations has established the general prevailing rates of

per diem wages for each craft, classification, and type of work needed to execute contracts for public works and improvements. The per diem wages published at the date the Contract is advertised for bids shall be applicable. Copies of the prevailing rate of per diem wages are on file at the California Department of Industrial Relations and are available to any interested party at www.dir.ca.gov/DLSR/PWD/index.htm. Future effective wage rates, which have been predetermined, are on file with the Department of Industrial Relations, are referenced but not printed in said publication. The new wage rates shall become effective on the day following the expiration date and apply to this Contract in the same manner as if they had been included or referenced in this Contract.

No contractor or subcontractor may be listed on a bid proposal for a public works project submitted unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5 or unless the contractor or subcontractor qualifies for an exception from this requirement, for bid purposes only, as set forth in the Labor Code section 1771.1(a). If contractor or subcontractor believes that such an exception in 1771.1(a) applies, it must provide the applicable exception(s) in its bid proposal. Even those contractors or subcontractors who qualify for an exception under 1771.1(a) must be registered with DIR at the time of award, if such award is made on or after April 1, 2015.

No contractor or subcontractor may be awarded a contract for public work on a public works projected awarded on or after April 1, 2015 unless registered with DIR pursuant to Labor Code section 1725.5.

Furthermore, the current Federal General Wage Determinations apply for this project as predetermined by the Secretary of Labor. If there is a difference in the Federal minimum wage rates and the California Department of Industrial Relations for similar classifications of labor, the Contractor and its subcontractors shall pay not less than the higher wage rate.

The wage rate for any classification not listed by the Federal Department of Labor or the California Department of Industrial Relations, but which may be required to execute the Contract, shall be in accord with specified rates for similar or comparable classifications or for those performing similar or comparable duties, within the agencies determinations.

The Contractor may substitute securities for retention monies pursuant to Public Contract Code, Section 22300.

Dated this 5 day of September, 2019

CAMROSA WATER DISTRICT

CAMROSA WATER DISTRICT

ENGINEERING DEPARTMENT

BID TERMS AND CONDITIONS

FOR

RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

SPECIFICATION NO. PW 19-04

BID TERMS AND CONDITIONS

Requirement to Meet All Bid Provisions - Each bidder shall meet all of the specifications and bid terms and conditions. By virtue of the bid submission, the bidder acknowledges agreement with and acceptance of all provisions of the specifications except as expressly qualified in the proposal. Nonsubstantial deviations may be considered provided that the bidder submits a full description, explanation of, and justification for the proposed deviations. Whether any proposed deviation is nonsubstantial will be determined by the District in its sole discretion.

License - In accordance with the provisions of California Public Contract Code Section 3300, the District has determined that the bidder shall possess a valid applicable class Contractor's License as specified in the Contract documents. Failure to possess the specified license at the time of bid submittal shall render the bid as non-responsive and shall act as a bar to award the Contract to any bidder not possessing said license.

Communications Regarding Bid - If a prospective bidder is in doubt as to the true meaning or intent of any part of the Contract documents, or discovers discrepancies or omissions, the bidder may submit questions to the District Engineer at terryc@camrosa.com . Any questions regarding membership or downloading should be directed to QuestCDN at (952) 233-1632 or info@questdcn.com . Interpretations or corrections of the Contract documents shall be made via the Q&A feature or by addendum duly issued by the District Engineer. A copy of such addendum shall be posted online through QuestCDN. The contractor shall be required to be registered with QuestCDN to obtain automatic electronic notifications. Such addendum shall be considered a part of and incorporated in the Contract documents.

All timely requests for information submitted in writing will receive a written response from the District. Telephone communications with District staff are not encouraged but will be permitted. However, any such verbal communication shall not be binding on the District.

Bidder's Bond Requirement - Bidders shall provide a properly executed bidder's bond (contained herein), cashier's check, or other bidder's security payable to the Camrosa Water District to accompany the proposal in the amount of ten percent (10%) of the total bid. The proceeds thereof will become the property of the District if the bidder fails to or refuses to execute the contract within ten (10) calendar days after the District has notified the bidder of intent to award the bid or within ten (10) calendar days after notice of the award has been sent by mail to the bidder, whichever occurs first. It is the Camrosa Water District Board of Directors' policy that the bid bond or other bidder's security will not be waived due to calculation errors made by the bidder. Additionally, the proceeds of the bidder's bond will become the property of the District if the bidder fails to or refuses to furnish satisfactory bonds or evidence of insurance required in the contract construction documents within ten (10) days after the bid has been awarded. The bond shall be sufficient and duly executed by a surety admitted to do business in the State of California. All bid bonds or substitutes therefore will be returned upon timely execution of the Contract and the filing of satisfactory insurance certifications and bonds by successful bidder.

Bid Submission - Each bid must be submitted on the form(s) provided in the proposal. The proposal shall be enclosed in an envelope, which shall be sealed and addressed to the District Engineer, Camrosa Water District, 7385 Santa Rosa Road, Camarillo, California 93012. In order

to guard against premature opening, the proposal shall be clearly labeled with the bid title, name of bidder, and date and time of bid opening. If the proposal is delivered to the District via express delivery, or other priority mail service, the above information must also be included on the outside shipment envelope.

Submission of One Bid Only - No individual, or business entity of any kind shall be allowed to make or file or to be interested in more than one bid, except an alternative bid when specifically requested. However, an individual who has quoted prices on materials to a bidder submitting a proposal is not thereby disqualified from quoting prices to other bidders submitting proposals.

Bid Withdrawal - A bidder may withdraw its proposal without prejudice prior to the time specified for the bid opening by submitting a written request to the Business Manager for its withdrawal. If this occurs, the proposal will be returned to the bidder unopened. No proposal received after the time specified or at any place other than the place stated in the Notice Inviting Bids will be considered. All bids will be opened and declared publicly. Bidders or their representatives are invited to be present at the opening of the bids.

Bid Quotes and Unit Price Extensions - The extensions of unit prices for the quantities indicated and the lump sum prices quoted by the bidder must be entered in figures in the spaces provided on the Bid Submission Form(s). The Bid Submission Form(s) must be totally completed. If the unit price and the total amount stated by any bidder for any item are not in agreement, the unit price alone will be considered as representing the bidder's intention and the total will be corrected to conform to the specified unit price.

Bid Retention and Award - The District reserves the right to retain all proposals for a period of sixty (60) days after the bid opening date for examination and comparison. The District also reserves the right to determine and waive nonsubstantial irregularities in any proposal, to reject any or all proposals, to reject one part of a proposal and accept the other, except to the extent that the proposals are qualified by specific limitations, and to make award to the lowest responsive and responsible bidder as the interest of the District may require.

Labor Actions - In the event that the successful bidder is experiencing a labor action at the time of the award of the bid (or if its suppliers or subcontractors are experiencing such a labor action), the District reserves the right to declare said bidder is no longer the lowest responsible bidder and may accept the next acceptable low bid from a bidder that is not experiencing a labor action and declare it to be the lowest responsible bidder.

Contract Requirement - The bidder to whom award is made, shall execute a written contract with the District within ten (10) calendar days after notice of the award has been sent by mail to the address given in the proposal or within ten (10) calendar days after receipt by bidder of oral communication of the intent to award, whichever occurs first. The Contract shall be made in the form adopted by the District and incorporated in these specifications. The bidder warrants that bidder possesses, or has arranged through subcontracts, all capital and other equipment, labor and materials to carry out and complete the work hereunder in compliance with all Federal, State, County, City and Special District Laws, Ordinances, and Regulations which are applicable; and further, bidder shall comply with all Federal, State, County, City and Special District Laws, Ordinances, and Regulations which are applicable.

Failure to Accept Contract – If, upon notification of intent to award the bid by the District, the bidder fails to enter into the Contract within the specified time period, the pending award will be annulled. Any bid security will be forfeited in accordance with these Bid Terms and Conditions if a bidder's bond or security is required. An award may be made to the next lowest responsive and responsible bidder who shall fulfill every term and condition of the bid.

Business Tax - The City of Camarillo and Ventura County Business Tax Ordinance requires that a Business Tax Receipt be obtained before any business, trade, profession, enterprise, establishment, occupation, or calling is conducted within the City or County. The amount of the tax is based on gross receipts resulting from business conducted in the City of Camarillo or unincorporated areas of the County and is required to be paid when business is conducted even though the principal location of the business may be outside of the City or County or a Business Tax Receipt has been issued to them by another agency. Issuance of a Business Tax Receipt is only evidence of the fact that the tax has been paid. It does not sanction or approve any activity not otherwise permitted. Verification that the bidder has a valid Business Tax Receipt will be obtained by the District prior to the execution of the Contract.

Faithful Performance Bond Requirement - The bidder to whom the Contract is awarded (Contractor) shall execute the Contract and furnish a surety bond in the amount of one hundred percent (100%) of the Contract bid price guaranteeing the faithful performance of the Contract. The bond shall remain in force for a period of one year after the date of recordation of Notice of Completion by District. The bond shall be sufficient and duly executed by a surety admitted to do business in the State of California.

Material Suppliers and Laborer Bond Requirement - The Contractor shall furnish a surety bond by an admitted surety in the amount of one hundred percent (100%) of the Contract bid price to secure the payment of claims for materials and labor provided by others in performing the work. The bond shall be sufficient and duly executed by a surety admitted to do business in the State of California.

Antitrust Claims - In accordance with Section 4552 of the Government Code, 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. Sec. 15) or under the Cartwright Act [Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code], arising from purchases of goods, 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.

Prevailing Wages and Minority Group Skill Upgrade and Employment - Bidders are hereby notified that pursuant to the provisions of the California Labor Code the California Department of Industrial Relations has ascertained the general prevailing rate of per diem wages and the general prevailing rate for legal holiday and overtime work in the locality in which this work is to be performed for each craft, classification or type of worker needed to execute the contract. Such wage scale is set forth at length in a Schedule of Prevailing Rates of Wages that is on file at the California Department of Industrial Relations and is available at www.dir.ca.gov/DLSR/PWD/index.htm. The published prevailing wage rates that the Contractor shall pay are hereby incorporated in and made a part of these Bid Terms and Conditions.

The bidder to whom the Contract is awarded shall assist in locating, qualifying, hiring, and increasing the skills of minority group employees and applicants for employment, as set forth in Executive Orders 11246 and 11375.

Public Records Act - All information contained in the proposal is public information once opened unless it is bona fide trade secret information and is labeled as such. Any California Public Records Act request for information labeled as a trade secret shall be forwarded to the bidder for legal defense. Failure on the part of the bidder to promptly defend against any such request or action shall be deemed an unqualified waiver of the confidentiality of all trade secret information in the proposal.

Recycled Purchase Requirement - Bidders are hereby notified that pursuant to the provisions of Sections 22150–22154 of the California Public Contract Code the District is required to purchase recycled products as defined in Section 12200 of the same Code if the product fitness and quality are equal to the nonrecycled product and available at the same or a lesser total cost than nonrecycled items. Bidders shall offer products and prices to the District that meets these requirements.

Retention Withheld – The Camrosa Board of Directors will be withheld from all contractor progress payments, retention until completion and acceptance by the District.

CAMROSA WATER DISTRICT

ENGINEERING DEPARTMENT

PROPOSAL

FOR

RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

SPECIFICATION NO. PW 19-04

ENGINEERING DEPARTMENT

PROPOSAL

FOR

RESERVOIR 3D SITE DRAINAGE

Specification No.:	PW 19-04
Bids to be Received on:	October 17, 2019, at or before 2:00 p.m.
Completion Time:	70 Calendar Days
Liquidated Damages:	$500 Per Calendar Day
Number of Pages in Proposal:	17

CONTRACTOR

Name _____

Street Address _____

City _____ State _____ Zip Code _____

Telephone Number _____

Fax Number _____ (Optional)

The bid shall be balanced so that each bid item is priced to carry its share of the cost of the work and also its share of the contractor's overhead and profit. The District reserves the right to delete any bid item to the extent that the bid is qualified by specific limitation. An unbalanced bid shall be considered as grounds for rejecting the entire bid.

SUBMIT PAGES 13 THROUGH 29 FULLY EXECUTED WITH THIS PROPOSAL

LIST OF DOCUMENTS

TO BE SUBMITTED WITH PROPOSAL

FOR

RESERVOIR 3D SITE DRAINAGE

INSTRUCTIONS FOR SIGNING PROPOSAL, BONDS AND CONTRACT

Corporations

a) Give name of Corporation.
b) Signatures: President or Vice President and Secretary or Assistant Secretary.
c) Affix corporate seal and notary's acknowledgment.
d) Others may sign for the corporation if the District has been furnished a certified copy of a resolution of the corporate board of directors authorizing them to do so.

Partnerships

a) Signatures: All members of partnership. One may sign if District has a copy of authorization.
b) Affix notary's acknowledgment.

Joint Ventures

a) Give the names of the joint venturers.
b) Signatures: All joint venturers. One may sign if District has a copy of authorization.
c) Affix notary's acknowledgment.

Individuals

a) Signature: The individual.
b) Affix notary's acknowledgment.
c) Another may sign for the individual if the District has been furnished a notarized power-of-attorney authorizing the other person to sign.

Fictitious Names

a) Show fictitious names.
b) Satisfy all pertinent requirements shown above.

Bonds

a) In addition to all pertinent requirements above, give signature of Attorney-in-fact and apply surety's seal and provide address and telephone number of said surety.

PLEASE ADHERE TO THE APPLICABLE SIGNING INSTRUCTIONS

CONTRACTOR'S PROPOSAL STATEMENT

Camrosa Water District
Camarillo, California 93012

Pursuant to the foregoing Notice Inviting Bids, the undersigned declares that he/she has carefully examined the location of the proposed work, that he/she has examined the Plans and Specifications and read the accompanying instructions to bidders, and hereby proposes to furnish all materials and to do all the work required to complete such work in accordance with such Plans and Specifications for the prices set forth in this Proposal.

The undersigned has carefully checked all the figures in this Proposal and understands that District will not be responsible for any error or omission on the part of the undersigned in preparing this bid nor will District release the undersigned on account of such error or omission.

The undersigned swears or affirms under penalty of perjury that the information regarding the Contractor's License is true and correct.

The undersigned further agrees that in case of default in executing the required Contract within the applicable ten (10) calendar days or thereafter failing to provide the necessary bonds within ten (10) calendar days after the Contract has been fully executed, the proceeds of check or bond accompanying the bid shall become the property of the Camrosa Water District. Furthermore, the undersigned is advised and understands that it is a District policy that bids/bonds will not be waived due to calculation errors made by the bidder.

Licensed in accordance with an act providing for the registration of Contractor's License:

No.	Class	Expiration Date
_____	_____	_____
No.	Class	Expiration Date
_____	_____	_____

Names of Co-Partners or Corporate Officers and Titles: _____

_____

_____ _____
Signature of Bidder Title

_____ _____
Signature of Bidder Title

_____ _____
Name of Contractor or Firm Date of Submittal

Telephone: (___) _____

Address _____

_____ _____
Doing Business as: Individual / Partnership / Corporation State of Incorporation

Federal Tax Identification Number: _____

ALL SIGNATURES MUST BE NOTARIZED
(Attach or Affix Executed Acknowledgment Form and Corporate Seal if Applicable)

PROPOSED SCHEDULE OF WORK AND PRICES
FOR
RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

Notice to Bidders:

1. Schedule "A" is for the complete construction of the Reservoir 3D Site Drainage complete and in place in accordance with the Contract Documents.

Bidders are required to bid on all Schedules.

SCHEDULE "A" PZ 2-3 PUMP STATION						
Item No.	**Payment Reference**	**Description**	**Quantity**	**Unit**	**Unit Price**	**Total**
1		Mobilization/Demobilization	1	LS		
2		10-inch Drain Pipeline and Discharge Structure	1	LS		
3		Interceptor Ditches	1	LS		
4		Erosion Fills on East Side of Project Site	1	LS		
5		Slurry Seal	1	LS		

Total Schedule "A" $_____

Total Schedule "A": _____
(Amount Written in Words)

PROPOSED SCHEDULE OF WORK AND PRICES - Continued

SCHEDULE "B" TERMINATION OF LIABILITY						
Item No.	**Payment Reference**	**Description**	**Quantity**	**Unit**	**Unit Price**	**Total**
1.	709	Termination of Liability	1	LS	$1.00	$1.00

Total Schedule "B" $1.00

BID SUMMARY	
Schedule "A" + Schedule "B"	$

Total Bid Price: _____

(Amount Written in Words)

Contractor's Name: _____

Contractor's Signature: _____

PROPOSED SCHEDULE OF WORK AND PRICES

*ADDITIONS/DEDUCTIONS

TOTAL AMOUNT BID $_____

	Schedule/Bid Item No.	New Total	
Addition for:		$_____	+$_____
Addition for:	_____	_____	+_____
Addition for:	_____	_____	+_____
Deduction for:	_____	_____	−_____
Deduction for:	_____	_____	−_____
Deduction for:	_____	_____	−_____

Adjusted Total Bid Amount: $_____

Adjusted Total Bid Amount in Words: _____

**Sales Tax Adjustment (If Applicable): _____

* Provisions are made for the bidder to include additions or deductions in price for bid item(s) to reflect last-minute adjustments in bidder's total bid amount. The bid item for which the addition or deduction in price is made shall be listed by the bidder as indicated above. The unit price for that item (if applicable) shall be adjusted by dividing the bid quantity into the new total amount as determined after adding or subtracting the amount listed by the Contractor for such item.

** Sales tax deduction entered on this line is the amount the bid is to be reduced in order to receive credit for purchases made in the City or County pursuant to Bid Terms and Conditions, Sales Tax Reimbursements.

The following addenda are acknowledged:	Number	Date
(Bidder must fill in number and date of each addendum or may enter the word "None" if appropriate.)	_____	_____
	_____	_____
	_____	_____

I make this Proposal and certify under penalty of perjury that all the statements in this Proposal that I have signed are true and correct.

_____ _____

Contractor's Name Date Contractor's Name Dat

_____ _____

Signature and Title Signature and Title

BIDDER'S BOND TO ACCOMPANY PROPOSAL
(in lieu of cash or cashier's check)

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____, as Principal, and _____

_____, as Surety, acknowledge ourselves jointly and severally bound to the Camrosa Water District (District), the obligee, for ten percent (10%) of the total bid, to be paid to said District if the Proposal shall be accepted and the Principal shall fail to execute the Contract tendered by the District within the applicable time specified in the Bid Terms and Conditions, or fails to furnish either the required Faithful Performance or Labor and Material Bonds, or fails to furnish evidence of insurance as required in the Standard Specifications, then this obligation shall become due and payable, and Surety shall pay to obligee, in case suit is brought upon this bond in addition to the bond amount hereof, court costs and a reasonable attorney's fee to be fixed by the court. If the Principal executes the Contract and furnishes the required bonds and evidence of insurance as provided in the bid documents, this bond shall be extinguished and released. It is hereby agreed that bid errors shall not constitute a defense to forfeiture.

WITNESS our hands this _____ day of _____, 20__.

_____
Contractor

By _____

Title _____

By _____

Title _____

_____
Surety

By _____

Title _____

FORM TO ACCOMPANY BID BOND

STATE OF CALIFORNIA)
COUNTY OF) SS.
CITY OF)

On this _____ day of _____, 20__, before me, the undersigned, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared _____, known to be the _____ of _____ and the same person whose name is subscribed to the within instrument as the _____ of said _____ _____, and the said _____ duly acknowledged to me that he/she subscribed the name of _____thereto as Surety and his/her own name as _____.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

_____
Notary Public in and for said
County and State aforesaid

If cashier's check is submitted herewith, state check number _____ and amount $_____.

STATEMENT OF BIDDER'S QUALIFICATIONS AND REFERENCES

The bidder is required to state the bidder's financial ability and a general description of similar work performed.

Required qualifications: Bidders must hold a valid State of California Class A Contractor's License at the time the bid is submitted to the District, and must have satisfactorily completed at least three (3) Southern California municipal projects in the last three (3) years of comparable size to the scope of this project.

Number of years engaged in providing the work included within the scope of the specifications under the present business name: _____.

List and describe fully the last three (3) contracts performed by your firm, which demonstrate your ability to complete the work included within the scope of the specifications. Attach additional pages if required. The District reserves the right to contact each of the references listed for additional information regarding your firm's qualifications.

Reference No. 1

Customer Name: _____
Contact Individual: _____ Telephone: _____
Address: _____
Contract Amount: _____ Year: _____
Description of Work Done:
_____
_____

Reference No. 2

Customer Name: _____
Contact Individual: _____ Telephone: _____
Address: _____
Contract Amount: _____ Year: _____
Description of Work Done:
_____
_____

Reference No. 3

Customer Name: _____
Contact Individual: _____ Telephone: _____
Address: _____
Contract Amount: _____ Year: _____
Description of Work Done:
_____
_____

Continued

STATEMENT OF BIDDER'S QUALIFICATIONS AND REFERENCES – Continued

STATE OF CALIFORNIA, COUNTY OF _____

I am the _____ of _____, the bidder herein. I have read the foregoing statement and know the contents thereof, and I certify that the same is true to my knowledge, except as to those matters which are therein stated upon my information or belief, and as to those matters, I believe it to be true.

_____

_____

Executed on _____, 20___, at _____, California.

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

_____
Signature of Bidder

_____
Title

_____
Signature of Bidder

_____
Title

STATEMENT OF BIDDER'S PAST CONTRACT DISQUALIFICATIONS

Pursuant to Section 10162 of the Public Contract Code, the bidder shall state whether such bidder, or any officer or employee of such bidder who has a proprietary interest in such bidder, has ever been disqualified, removed, or otherwise prevented from bidding on, or completing a Federal, State, or local government project because of a violation of law or a safety regulation; and if so, explain the circumstances.

1. Do you have any disqualification, removal, etc., as described in the above paragraph to declare?

   Yes _____ No _____

2. If yes, explain the circumstances.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Executed on _____, 20__, at _____, California.

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

_____ _____

Signature(s) of Authorized Bidder Signature(s) of Authorized Bidder

_____ _____

Title Title

QUESTIONNAIRE REGARDING SUBCONTRACTORS

Bidder shall answer the following questions and submit with the Proposal.

1. Were bid depository or registry services used in obtaining subcontractor bid figures in order to compute your bid? Yes ( )No ( )

2. If the answer to No. 1 is "yes," please forward a copy of the rules of each bid depository you used with this questionnaire.

3. Did you have any source of subcontractors' bids other than bid depositories? Yes ( )No ( )

4. Has any person or group threatened you with subcontractor boycotts, union boycotts, or other sanctions to attempt to convince you to use the services or abide by the rules of one or more bid depositories. Yes ( )No ( )

5. If the answer to No. 4 is "yes," please explain the following details:

   (a) Date: _____

   (b) Name of person or group: _____

   (c) Job involved (if applicable): _____

   (d) Nature of threats: _____

   (e) Additional comments (use additional paper if necessary):
   _____

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

Dated this _____ day of _____, 20__.

_____
Name of Company

By _____

_____
Title

By _____

_____
Title

BIDDER'S STATEMENT OF SUBCONTRACTORS AND MATERIAL FABRICATORS

Without exception, the bidder is required to state the name and address of each subcontractor and the portion of the work which each will do as required by Section 2-3, "Subcontracts," of the Standard Specifications and in conformance with Public Contracts Code, Sections 4100 to 4113, inclusive.

Without limiting the generality of the foregoing, any contractor making a bid or offer to perform the work, shall set forth in the Proposal:

(a) The name and the location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent (0.5%) of the prime contractor's total bid; and

(b) The portion of the work, which will be done by each subcontractor. The prime contractor shall list only one subcontractor for each portion.

The undersigned submits herewith a list of subcontractors in conformance with the foregoing:

Name under Which Subcontractor is Licensed	License No. & Class	Business Address	Specific Description of Subcontract and Portion of the Work to be Done

_____ _____
Signature of Bidder Date Signature of Bidder Date

_____ _____
Title Title

ALL SIGNATURES MUST BE NOTARIZED
(Attach or Affix Executed Acknowledgement Form)

NON-COLLUSION AFFIDAVIT

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

To the Camrosa Water District
DISTRICT ENGINEERING

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

_____	_____
Name of Bidder	Name of Bidder
_____	_____
Signature of Bidder	Signature of Bidder
	_____
	Address of Bidder

ALL SIGNATURES MUST BE NOTARIZED
(Attach or Affix Executed Acknowledgment Form)

EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATE

THE BIDDER'S EXECUTION OF THE SIGNATURE PORTION OF THIS PROPOSAL SHALL ALSO CONSTITUTE AN ENDORSEMENT AND EXECUTION OF THOSE CERTIFICATES, WHICH ARE A PART OF THIS PROPOSAL.

The bidder hereby certifies that the bidder and proposed subcontractor(s), if any, have or have not participated in a previous contract or subcontract subject to the Equal Opportunity Clause, as required by Executive Orders 11246, entitled "Equal Employment Opportunity" as amended by Executive Order 11375, and supplemented by Department of Labor Regulations 41 CFR, Part 60, and that, where required, the bidder has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government Contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

_____
Name of Bidding Company

By_____
Authorized Signature

_____
Title (Typed)

_____
Date

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

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

is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;

has not been suspended, debarred, voluntarily excluded, or determined ineligible by any federal agency within the past three (3) years;

does not have a proposed debarment pending; and

has not been indicted, convicted, or had a civil judgment rendered against bidder by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three (3) years.

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

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

The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

Note: Providing false information may result in criminal prosecution or administrative sanctions.

CAMROSA WATER DISTRICT

ENGINEERING DEPARTMENT

DOCUMENTS FOR EXECUTION BY SUCCESSFUL BIDDER

FOR

RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

SPECIFICATION NO. PW 19-04

LIST OF DOCUMENTS FOR

EXECUTION BY SUCCESSFUL BIDDER

CONTRACT BETWEEN THE CAMROSA WATER DISTRICT AND _____ FOR RESERVOIR 3D SITE DRAINAGE, SPECIFICATION NO. PW 19-04

THIS CONTRACT is made and entered into in the City of Camarillo on this _____ day of _____, 20__, by and between the CAMROSA WATER DISTRICT, hereinafter referred to as DISTRICT, and _____, a _____, hereinafter referred to as CONTRACTOR. *(type of business entity)*

RECITALS:

WHEREAS, on September 5, 2019, DISTRICT invited bids for Reservoir 3D Site Drainage, per Specification No. PW 19-04; and

WHEREAS, pursuant to said invitation, CONTRACTOR submitted a Proposal which was accepted by DISTRICT for said project.

NOW, THEREFORE, in consideration of their mutual promises, obligations, and covenants hereinafter contained, the parties hereto agree as follows:

1. **Recitals**. The foregoing recitals are true and correct and are a part of this CONTRACT.

2. **Term**. The term of this CONTRACT shall be from the date this CONTRACT is made and entered, as first written above, and shall be completed no later than ninety (90) consecutive calendar days after the receipt of the Notice to Proceed.

3. **Incorporation By Reference**. Public Contract Code Section 22300, Specification No. PW 19-04, consisting of 175 pages, and all documents incorporated by reference therein, and CONTRACTOR'S Proposal are hereby incorporated by reference and made a part of this CONTRACT.

4. **Precedence of Contract Documents**. If there is a conflict between or among CONTRACT documents, the document highest in precedence shall control. The precedence shall be:

First:	This Document consisting of six (6) pages excluding paragraph 3
Second:	CONTRACTOR'S Proposal
Third:	Permits from other agencies as may be required by law
Fourth:	Special Provisions
Fifth:	Bid Terms and Conditions
Sixth:	Detailed Plans
Seventh:	Standard Plans
Eighth:	Standard Specifications Modifications
Ninth:	"Standard Specifications for Public Works Construction" (SSPWC)

Tenth: Reference Specifications

Change orders, supplemental agreements, and approved revisions to plans and specifications become a part of item First.

5. **Obligations of the District**.

A. DISTRICT shall be obligated to pay CONTRACTOR based upon the actual DISTRICT-authorized quantities in place and the unit and/or lump sum prices bid by CONTRACTOR, including but not limited to all labor, material, and equipment, rather than the CONTRACT bid price.

B. DISTRICT shall make regular progress payments to CONTRACTOR within thirty (30) days after mutual concurrence with the unit quantities and/or lump sum items of work satisfactorily performed, subject to applicable retention requirements. In no event shall the total amount paid exceed the CONTRACT bid price of _____ Dollars ($_____) unless otherwise agreed to by the parties in writing.

C. Upon receipt of an invoice for work performed to DISTRICT'S satisfaction, DISTRICT shall make progress payments within thirty (30) days of receipt of invoice. If the work is not performed satisfactorily or the invoice is defective, DISTRICT shall notify CONTRACTOR, in writing, of the reasons within seven (7) days of receipt of invoice. The intent of this Section is to comply with Public Contract Code Section 20104.50.

6. **Obligations of the Contractor**.

A. CONTRACTOR shall perform as required by this CONTRACT. CONTRACTOR also warrants on behalf of itself and all subcontractors engaged for the performance of this CONTRACT that only persons authorized to work in the United States pursuant to the Immigration Reform and Control Act of 1986 and other applicable laws shall be employed in the performance of the work hereunder.

B. The CONTRACTOR shall comply with Labor Code Section 1773.2 and Federal prevailing wage requirements and a copy of the general wage rate list shall be posted at each job site. CONTRACTOR shall obey all Federal, State, local and special district laws, ordinances and regulations. CONTRACTOR agrees to indemnify, defend, and hold DISTRICT harmless from any claim that prevailing wages should have been paid pursuant to this CONTRACT, including federal prevailing wage requirements under the Davis-Bacon Act, if applicable, and shall be liable for the payment of same and any penalties thereon.

7. **Audit**. DISTRICT shall have the option of inspecting and/or auditing all records and other written materials used by CONTRACTOR in preparing its statements to DISTRICT as a condition precedent to any payment to CONTRACTOR.

8. **Hold Harmless and Indemnification**. CONTRACTOR shall defend and provide legal defense with attorney(s) acceptable to DISTRICT, District , indemnify, and hold harmless DISTRICT , its agents, officials, officers, representatives, and employees, from and against all claims, lawsuits, liabilities, or damages of whatever nature arising out of or in connection with, or relating in any manner to any act or omission of CONTRACTOR, its agents, employees, and subcontractors, and employees thereof, pursuant to the performance or non-performance of this CONTRACT. CONTRACTOR shall thoroughly investigate any and all claims and indemnify DISTRICT and do whatever is necessary to protect DISTRICT , its agents, officials, officers, representatives, and employees as to any such claims, lawsuits, liabilities, expenses, or damages arising out of this CONTRACT.

9. **Amendments**. Any amendment, modification, or variation from the terms of this CONTRACT shall be in writing and shall be effective only upon mutual written approval by the Director of Public Works and CONTRACTOR.

10. **Anti-Discrimination**. In the performance of the terms of this CONTRACT, CONTRACTOR shall not engage in, nor permit subcontractors to engage in, discrimination in employment of persons because of the age, race, color, religious creed, sex, sexual orientation, national origin ancestry, physical disability, mental disability, medical condition, or marital status of such persons. Violation of this provision may result in the imposition of penalties referred to in Labor Code Section 1735.

11. **Termination**. If, during the term of this CONTRACT, DISTRICT determines that CONTRACTOR is not faithfully abiding by any term or condition contained herein, DISTRICT may notify CONTRACTOR in writing of such defect or failure to perform. The notice must give to the CONTRACTOR a ten (10) day period of time thereafter in which to perform said work or cure the deficiency. If CONTRACTOR has not performed the work or cured said deficiency within the ten (10) days specified in the notice, such failure shall constitute a breach of this CONTRACT, and DISTRICT may terminate this CONTRACT immediately by written notice to CONTRACTOR to said effect. Thereafter, neither party shall have any further duties, obligations, responsibilities, or rights under this CONTRACT except however, any and all obligations of CONTRACTOR'S surety shall remain in full force and effect, and shall not be extinguished, reduced, or in any manner waived by the termination hereof. In said event, CONTRACTOR shall be entitled to the reasonable value of its services performed from the beginning of the period in which the breach occurs up to the day it received DISTRICT'S Notice of Termination, minus any damages, including liquidated damages if so provided herein, occasioned by such breach. DISTRICT reserves the right to delay any such payment until completion or confirmed abandonment of the project, as may be determined in DISTRICT'S sole discretion, so as to permit a full and complete accounting of costs. In no event, however, shall CONTRACTOR be entitled to receive in excess of the compensation quoted in its bid.

12. **Insurance**. CONTRACTOR shall, prior to commencing performance hereunder, submit proof of all insurance coverage as required by the Specification or other document incorporated in and made a part of this CONTRACT.

13. **Complete Contract**. This CONTRACT shall constitute the complete CONTRACT between the parties hereto. No oral agreement, understanding, or representation not

reduced to writing and specifically incorporated herein shall be of any force or effect, nor shall any such oral agreement, understanding, or representation be binding upon the parties hereto.

14. **Independent Contractor**. It is expressly understood between the parties to this CONTRACT that no employee/employer relationship is intended; CONTRACTOR is an independent contractor.

15. **Time of Performance**. Time is of the essence in this CONTRACT.

16. **Liquidated Damages**. Should CONTRACTOR fail to complete the project, or any part thereof, in the time agreed upon in the CONTRACT or within such extra time as may have been allowed for delays or extensions granted as provided in the CONTRACT, CONTRACTOR shall reimburse DISTRICT for the additional expense and damage for each calendar day that the CONTRACT remains uncompleted after the CONTRACT completion date. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the CONTRACT is the per diem rate of Five Hundred Dollars ($500.00) per calendar day. Such amounts are hereby agreed upon as liquidated damages for the loss to DISTRICT resulting from the failure of CONTRACTOR to complete the project within the allotted time and to the value of the operation of the works dependent thereon.

It is expressly understood and agreed that this amount is a reasonable amount and is established in lieu of damages, which are incapable of calculation at the inception hereof, and this amount is not to be considered in the nature of a penalty. DISTRICT shall have the right to deduct such damages from any amount due, or that may become due to CONTRACTOR, or the amount of such damages shall be due and collectible from CONTRACTOR or CONTRACTOR'S surety.

Progress payments made after the scheduled completion date shall not constitute a waiver of liquidated damages.

17. **Conflict of Interest**. Neither CONTRACTOR nor any employees, agents, or subcontractors of CONTRACTOR who will be assigned to this project, to the best of CONTRACTOR'S knowledge, own any property or interest in properties, business relationships, or sources of income which may be affected by the performance of this CONTRACT. Should one party hereto learn of any such interest, income source, or business relationship, such fact shall immediately be brought to the attention of the other party hereto. If the parties thereupon cannot mutually agree upon a means to eliminate the conflict, DISTRICT may terminate the CONTRACT immediately for non-performance pursuant to Section 11 herein.

18. **Successors and Assigns**. The terms hereof shall be binding upon and inure to the benefit of the successors and assigns of the parties hereto; provided, however, that no party hereto shall assign any of the benefits and burdens hereunder, whether voluntarily or by operation of law, without the prior written consent of the other party, and any such assignment without said consent shall be void.

19. **Authority to Execute Contract**. Both DISTRICT and CONTRACTOR do covenant that each individual executing this CONTRACT on behalf of each party is a person duly authorized and empowered to execute contracts for such party.

20. **Jurisdiction and Venue**. Jurisdiction is in the State of California and venue lies in Ventura County.

21. **Non-Appropriation of Funds.** Payments due and payable to CONTRACTOR for current services are within the current budget and within an available, unexhausted, and unencumbered appropriation of DISTRICT. In the event DISTRICT has not appropriated sufficient funds for payment of CONTRACT services beyond the current fiscal year, this CONTRACT shall cover only those costs incurred up to the conclusion of the current fiscal year.

22. **Notices**. All written notices required by or related to this CONTRACT shall be sent by Certified Mail, Return Receipt Requested, postage prepaid, and addressed as listed below. Neither party to this CONTRACT shall refuse to accept such mail; the parties to this CONTRACT shall promptly inform the other party of any change of address. All notices required by this CONTRACT are effective on the day of receipt, unless otherwise indicated herein. The mailing address of each party to this CONTRACT is as follows:

DISTRICT

Terry Curson, District Engineer
Engineering Department
7385 Santa Rosa Road
Camarillo, CA 93012

CONTRACTOR

_____
_____
_____
_____
_____

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed the day and year first above written.

Camrosa Water District

By: _____
Tony Stafford
General Manager

_____
(Name of contracting company)

By: _____

Title: _____

By: _____

Title: _____

BOND FOR FAITHFUL PERFORMANCE
BOND NO.

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____, hereinafter referred to as "Contractor," as principal, and _____

_____,

hereinafter referred to as "Surety," are held and firmly bound unto the Camrosa Water District, Camarillo, California, hereinafter referred to as "District" or "Obligee," in the sum of _____ Dollars ($_____), lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, jointly and severally, firmly by these presents.

The condition of the foregoing obligation is such that:

WHEREAS, Contractor has been awarded and is about to enter into the annexed Contract with the Camrosa Water District for the Reservoir 3D Site Drainage, Specification No. PW 19-04, and is required by District to give this bond in connection with the execution of said Contract.

NOW, THEREFORE, if Contractor shall well and truly do and perform all the covenants and obligations of said Contract to be done and performed at the time and in the manner specified herein, then this obligation shall be null and void one (1) year after the date of recordation of a Notice of Completion by District of the completed work; otherwise it shall be and remain in full force and effect, and Surety shall cause the Contract to be fully performed or to pay to Obligee the cost of performing said Contract in an amount not exceeding the said sum above specified, and shall also, in case suit is brought upon this bond, pay to Obligee court costs and a reasonable attorney's fee, to be fixed by the court.

Continued

BOND FOR FAITHFUL PERFORMANCE - Continued

IT IS FURTHER PROVIDED, that any alterations in the work to be done or the material to be furnished shall not in any way release either Contractor or Surety, nor shall any extension of time granted under the provisions of the Contract release either Contractor or Surety, and notice of such alterations or extensions of the Contract is hereby waived by Surety.

WITNESS our hands this _____ day of _____, 20__.

_____
Contractor

By_____

Title_____

By_____

Title_____

_____
Surety

By_____

Title_____

FORM TO ACCOMPANY BOND FOR FAITHFUL PERFORMANCE

STATE OF CALIFORNIA)
COUNTY OF) SS.
CITY OF)

On this _____ day of _____, 20__, before me, the undersigned, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared _____, known to be the _____ of _____ and the same person whose name is subscribed to the within instrument as the _____ of said _____ _____, and the said _____ duly acknowledged to me that he/she subscribed the name of _____ thereto as Surety and his/her own name as _____.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

_____
Notary Public in and for said
County and State aforesaid

BOND FOR MATERIAL SUPPLIERS AND LABORERS

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____, hereinafter referred to as "Contractor," as principal, and _____

_____,

hereinafter referred to as "Surety," are held and firmly bound unto the Camrosa Water District, Camarillo, California, hereinafter referred to as "District" or "Obligee," in the sum of _____ Dollars ($_____), lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, jointly and severally, firmly by these presents.

The condition of the foregoing obligation is such that:

WHEREAS, Contractor has been awarded and is about to enter into the annexed Contract with the Camrosa Water District for construction of the Reservoir 3D Site Drainage, Specification No. PW 19-04, and is required by District to give this bond in connection with the execution of said Contract.

NOW, THEREFORE, if Contractor in said Contract, or any subcontractor, fails to pay for any materials, provisions, or its other supplies or items used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor of any kind, or for amounts due under the Unemployment Insurance Code with respect to such work or labor, Surety will pay for the same in an amount not exceeding the sum specified above, and also, in case suit is brought upon this bond, a reasonable attorney's fee to be fixed by the court.

This bond shall inure to the benefit of any and all persons named in Section 3181 of the Civil Code of the State of California.

Continued

BOND FOR MATERIAL SUPPLIERS AND LABORERS - Continued

IT IS FURTHER PROVIDED, that any alterations in the work to be done or the material to be furnished which may be made pursuant to the terms of said Contract shall not in any way release either Contractor or Surety, nor shall any extensions of time granted under the provisions of said Contract release either Contractor or Surety, and notice of such alterations or extensions of said Contract is hereby waived by Surety.

WITNESS our hands this _____ day of _____, 20__.

_____
Contractor

By_____

Title_____

By_____

Title_____

_____
Surety

By_____

Title_____

FORM TO ACCOMPANY BOND FOR MATERIAL SUPPLIERS AND LABORERS

STATE OF CALIFORNIA)
COUNTY OF) SS.
CITY OF)

On this _____ day of _____, 20__, before me, the undersigned, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared _____, known to be the _____ of _____ and the same person whose name is subscribed to the within instrument as the _____ of said _____ _____, and the said _____ duly acknowledged to me that he/she subscribed the name of _____thereto as Surety and his/her own name as _____.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

_____
Notary Public in and for said
County and State aforesaid

WORKERS' COMPENSATION INSURANCE CERTIFICATE

Sections 1860 and 1861 of the California Labor Code require every contractor to whom a public works contract is awarded to sign and file with the awarding body the following statement:

> "I am aware of the provisions of Section 3700 of the Labor Code which requires 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."

By_____

Date: _____ Title_____

By_____

Date: _____ Title_____

CAMROSA WATER DISTRICT

ENGINEERING DEPARTMENT

STANDARD SPECIFICATIONS

FOR

RESERVOIR 3D SITE DRAINAGE IMPROVEMENTS

SPECIFICATION NO. PW 19-04

CAMROSA WATER DISTRICT

STANDARD SPECIFICATIONS

0-1 STANDARD SPECIFICATIONS

Except as hereinafter provided, the provisions of the latest edition of the Standard Specifications for Public Works Construction (SSPWC), and all supplements thereto, prepared and promulgated by the Greenbook Committee of Public Works Standards Inc., formerly the Southern California Chapter of the American Public Works Association and the Associated General Contractors of America, and the following modifications thereto are established as the Standard Specifications for the District. They will be referred to in the Special Provisions as the "Standard Specifications."

0-2 DELETIONS

The following sections of the SSPWC are hereby deleted: 2-2, 2-5.2, 6-6.1, 6-9, 7-3, 7-4, 7-10, 9-3.3, 214, 307, 310-5.6.

0-3 NUMBERING OF SECTIONS

The numbering of sections and subsections in these modifications are compatible with the numbering in the SSPWC. The Special Provisions will be numbered as Sections 700 through 799.

The replacement sections of those sections deleted from the SSPWC shall have the same numbers as the sections they replaced.

0-4 ADDITIONS

The sections which follow either replace sections of like number in the SSPWC, which were deleted in Section 0-2 above, or add material not in the SSPWC.

SECTION 1 – TERMS, DEFINITIONS, ABBREVIATIONS AND SYMBOLS

1-2 DEFINITIONS

1-2.1 Additional Definitions

Acceptance – The formal written acceptance by the District of the completed project.

Addendum – A notice issued to all prospective bidders during the bidding period when the modification of the plans and/or specifications necessary to change, correct, clarify or further define any aspect of the work.

Agency/District – Camrosa Water District.

Approved Equal – or words of the like import refer to a material which has been approved by the District Engineer as similar and equal in all respects and acceptable for use in lieu

of the particular materials as specified herein. No "approved equal" material shall be used in any of the work unless approval to use same is first obtained in writing from the District Engineer. The District reserves the right to reject any and all materials, either before or after installation that are not as specified or approved by the District Engineer in writing. In all cases where propriety articles are specified, it is the intent of these specifications to permit the use of approved equals, unless specifically prohibited. Requests for "approved equal" status for proposed substitutions shall be submitted within fifteen (15) days after the award of the Contract. Such requests shall include substantiating data and the proposed credit to the Contract price for the use of such substitution, should it be approved.

Approved, Required, Directed – or words of similar import, refer to and indicate that the work or materials shall be "approved," "required," or "directed" by the Camrosa Water District or its duly authorized representative.

Bid – That document included in the Proposal setting forth the performance prices for the work.

Board of Directors – The body constituting the awarding authority of the District.

Department – Engineering Department of Camrosa Water District.

Due Notice – A written notification, given in due time, of a proposed action where such notification is required by the Contract to be given a specified interval of time (usually 48-hours or two working days) prior to the commencement of the contemplated action. Notifications may be from District to Contractor or from Contractor to District.

Engineer – The District Engineer of the Camrosa Water District.

Laboratory - Any laboratory of a public agency or any recognized commercial testing laboratory approved by the District.

Prompt – The briefest interval of time required for a considered reply, including the time required for approval by a governing body.

Proposal – Includes all those documents, which must be submitted by bidder in order to be awarded the Contract.

1-3 ABBREVIATIONS

1-3.3.1 Institutions

AAN	American Association of Nurserymen
ACI	American Concrete Institute
AGC	Associated General Contractors of America
AISC	American Institute of Steel Construction
APCD	Air Pollution Control District
APWA	American Public Works Association

ASA	American Standards Association
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWWA	American Water Works Association
CAL-OSHA	California Occupational Safety & Health Administration
CITY	City of Camarillo
CRSI	Concrete Reinforcing Steel Institute
DISTRICT	Camrosa Water District
IEEE	Institute of Electric and Electronic Engineer
NEC	National Electrical Code
NFPA	National Fire Protection Association
RSRPD	Rancho Simi Recreation and Parks District
SSPWC	Standard Specifications for Public Works Construction, latest edition, prepared by the Greenbook Committee of Public Works Standards, Inc., formerly the Southern California Chapters of AGC and APWA
SSS	State of California, Department of Transportation, Standard Specifications, latest edition
VCFCD	Ventura County Flood Control District
VCTC	Ventura County Transportation Commission

SECTION 2 – SCOPE AND CONTROL OF THE WORK

2-2 CONTRACT ASSIGNMENT

The bidder shall not in whole or in part, assign, transfer, convey, or otherwise dispose of the Contract, or its right, title or interest, or its power to execute such a contract to any individual or business entity of any kind without the previous written consent of the District.

2-5 PLANS AND SPECIFICATIONS

2-5.1.1 Accuracy of Specifications

The specifications and the plans for this project are believed by the District to be accurate and to contain no misrepresentation or any concealment of any material fact. Bidders are cautioned to undertake an independent analysis of any materials, test data and results, if any, in the specifications. District does not guarantee the accuracy of any interpretations of test data and results contained in the specifications. Bidder and all subcontractors named in the Proposal shall bear sole responsibility for bid errors resulting from misstatements or omissions in the plans and specifications which would have been ascertained by examining either the project site or the test data and results, if any, in the District's possession.

Although the effect of ambiguities or defects in the plans and specifications will be as determined by law, any patent ambiguity or defect shall give rise to a duty of the bidder to inquire prior to bid submission. Failure to so inquire shall cause any such ambiguity to be construed against the bidder and/or a waiver of any defect by the bidder.

An ambiguity or defect shall be considered patent if it is of such a nature that the bidder assuming reasonable skill, ability, and diligence, knew or should have known of the existence of the ambiguity or defect. Furthermore, failure of the bidder or subcontractors to notify District in writing of bid specifications or plans defects or ambiguities prior to bid submission shall waive any right to assert said defects or ambiguities subsequent to submission of the bid.

To the extent that these specifications constitute performance specifications, the District shall not be liable for costs incurred by the successful bidder to achieve the project's objective or standard beyond the amounts provided therefor in the bid.

In the event that any dispute arises after awarding the bid as a result of any actual or alleged ambiguity or defect in the plans and/or specifications, or over any other matter whatsoever, Contractor shall immediately notify District in writing. Contractor and all subcontractors shall continue to perform whether or not the ambiguity or defect is major, material, minor, or trivial, and whether or not a change order, time extension, or additional compensation has been granted by the District. Failure to provide such written notice within one working day of Contractor becoming aware of the facts giving rise to the dispute shall constitute a waiver of the right to assert the causative role of the defect or ambiguity in the plans or specifications concerning the dispute.

2-5.4 Bidders Required to Make Investigations

Bidders are required to make their own investigations and their own estimates of the site. It is not intended nor to be inferred that the specifications are or constitute any representation of warranty, express or implied, by the Camrosa Water District or any officer or employee, thereof, that any conditions which may seem to be indicated by the specifications actually exist or are to be relied upon either with reference to site or subsoil conditions, the presence or absence of groundwater, or otherwise. The bidder to whom this Contract is awarded covenants and agrees by execution of the Contract that the specifications do not constitute any warranty or representation, express or implied, respecting actual conditions which will be encountered by the Contractor in performance of the Contract and that the Contractor cannot and does not rely thereon and shall not be relieved of liability under the Contract. Neither the District nor any officer or employee thereof shall be liable to the Contractor as a result of any difference or variance between conditions suggested or seemingly indicated by the specifications of the work or otherwise. It is the overriding purpose and intent of the parties that the Contractor assumes all risks in connection with performance of the work in accordance with the Contract documents regardless of any such difference or variance. The Contractor forever and irrevocably waives, relinquishes, and releases any claims, rights, demands, damages, actions, and causes of action in connection therewith against the Camrosa Water District and its officers and employees.

2-5.5 Additional Investigations Required

Prior to bid submittal, the bidder must perform an independent site investigation and by the bid represents that the bidder has accomplished and is satisfied as to the result of the

investigation required under these Bid Terms and Conditions. In addition thereto, the bidder has investigated all other general and local conditions pertaining to the work to be performed, the site of the work and adjacent and nearby areas, including, but not limited to, those relating to transportation, the disposal, handling and storage of materials, availability of labor, water, electrical power, road and uncertainties of weather, all other physical conditions at and near the site of the work to be performed by the contractor, including the conformation and conditions of the ground, and the character of equipment and facilities needed prior to and during prosecution of the work. The bidder to whom this Contract is awarded covenants and agrees by execution of the Contract that the Contractor neither has nor shall have any claim, demand, action, or cause of action against the Camrosa Water District, or any officer or employee thereof, on account of or in respect to any such conditions, whether or not the same are ascertained or known by the Contractor. It is the sole responsibility of the Contractor to estimate properly the difficulties to be encountered in providing necessary labor, quantities of material, and the cost of successfully performing the Contractor's work in conformity with the Contract documents. Neither the Camrosa Water District nor any officer or employee thereof shall be responsible to the Contractor, nor shall any claim, demand, action or cause of action exist or arise in favor of the Contractor, on account of any oral statement or alleged representation made by the Camrosa Water District, or any officer or employee thereof, in respect to any of the foregoing matters.

SECTION 5 – UTILITIES

5-7 SCOPE OF WORK

Work shall conform to the provisions in Section 5 of the SSPWC. Manhole covers, water valve covers and grates of existing facilities will be adjusted to grade by the respective utility companies if such facilities are not included in the Contract. The Contractor shall cover grates with material suitable for preventing any paving material from passing through the grate. The Contractor shall mark the location of all existing covers by inscribing a cross in the new pavement or overlay. The cross mark shall be clear and legible after final rolling.

The Contractor shall remove extraneous material from the interior and exterior of manholes, valve boxes, storm drains, gutters, or other facilities. Covers, which are partially exposed, shall be cleaned to the satisfaction of the Engineer.

Immediately prior to placing asphalt emulsion, the Contractor shall wrap all utility covers in a three (3) mm plastic bag. The Contractor shall take care not to allow asphalt emulsion to run onto the covers. Diesel fuel application to the covers will not be allowed.

The Contractor shall contact the respective utility companies and other agencies listed below forty-eight (48) hours prior to starting any work on each road by which those companies are affected. To ensure that all utility companies are aware of the proposed work, the Contractor shall notify the Underground Service Alert Office (South USA) by calling 1-800-422-4133 at least two (2) working days prior to the start of any resurfacing work.

If the Contractor, while performing work pursuant to the Contract, discovers utility facilities not identified correctly or omitted in the Plans or Specifications by the District, the Contractor shall immediately notify the District and utility owner in writing.

Payment for costs incurred in protecting utility vaults, manholes, valve boxes, including the requirements pursuant to this section, shall be included in the prices bid for other items of work and no additional compensation will be allowed therefor.

UTILITY/AGENCIES TELEPHONE CONTACT LIST

CITY ENGINEER
(805) 583-6786

TRAFFIC ENGINEER
(805) 583-6786

CITY POLICE DEPARTMENT
(805) 583-6950

CALIFORNIA HIGHWAY PATROL
(805) 654-4710 (4571)

VENTURA COUNTY SHERIFF
(805) 494-8200

SIMI VALLEY TRANSIT DIVISION
(805) 583-6456

CAMROSA WATER DISTRICT
(805) 482-8063

CALLEGUAS MUNICIPAL WATER DISTRICT
(805) 526-9323

EDISON INTERNATIONAL COMPANY
(805) 494-7066

SOUTHERN CALIFORNIA GAS CO.
(818) 701-3468

MED TRANS AMBULANCE
(805) 495-4666

TIME WARNER
(805) 477-4439

AT&T TELEPHONE
(805) 583-6640

EQUILON CORPORATION
(310) 816-2063

CONOCO-PHILLIPS
(805) 525-6312

UNDERGROUND SERVICE ALERT
1-800-422-4133 OR 811

SOUTHERN PACIFIC TRANSPORTATION CO
(800) 336-9193

VENTURA COUNTY FIRE DEPARTMENT
(805) 389-9738, ext. 1

U.S. POST OFFICE
(805) 526-9189 OR (800) 275-8777

AMERICAN RUBBISH/GI RUBBISH
(805) 522-9400 EXT. 4360

ANDERSON RUBBISH
(805) 520-6656

VERIZON
800-624-9675

QWEST
800-283-4237

SECTION 6 - PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK

6-3.3 Temporary Suspension of Work

If suspension of work is ordered, Contractor shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through the construction for use by public traffic during the period of such suspension. In the event that the Contractor fails to perform the work above specified, the District will perform such work and the cost thereof will be deducted from monies due or to become due the Contractor.

If the Engineer orders a suspension of all of the work or a portion of the work, due to unsuitable weather or to such other conditions as are considered unfavorable to the suitable prosecution of the work, the days on which the suspension is in effect shall not be considered working days.

If a portion of work at the time of such suspension is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the determination of working days will be made on the basis of the then current controlling operation or operations.

If a suspension of work is ordered by the Engineer due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the Contract, the days on which the suspension order is in effect shall be considered working days if such days are working days.

6-6.1 Work Delay

If the Contractor is obstructed or delayed in the work required to be done hereunder by changes in the work or by any default, act, or omission of the District, or by strikes, or by fire, earthquake, or any other act of God, or by the inability to obtain materials, equipment, or labor due to Federal Government restrictions arising out of defense or war programs, then the time of completion may, at the District's sole option, be extended for such periods as may be agreed upon by the District and the Contractor.

6-8.1 No Waiver of Legal Rights

The District shall not be precluded or be stopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payment therefor from showing the true amount and character of the work performed and materials furnished by the Contractor, nor from showing that any such measurement, estimate, or certificate is untrue or is incorrectly made, nor that the work or materials do not in fact conform to the Contract.

The District shall not be precluded or stopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the Contractor or Surety, or both, for such damage as it may sustain by reason of the Contractor's failure to comply with the terms of the Contract.

Neither the acceptance by the Engineer or by the Engineer's representative nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, nor any possession taken by the Engineer shall operate as a waiver of any portion of the Contract or of any power herein reserved or of any right to damages.

A waiver of any breach of the Contract shall not be held to be a continuing waiver or a waiver of any other or subsequent breach.

6-8.2 Non-Complying Work

Neither the final payment nor any provision in the Contract documents, nor partial or entire occupancy of the premises by the District, nor recordation of Notice of Completion by District shall constitute an acceptance of work not done in accordance with the Contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship.

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7-2.2.1 Labor Laws

Labor Code Concerning Forfeiture for Worker Required to Work Excess Hours

As provided in Section 1810 of the Labor Code, eight (8) hours shall constitute a legal day's work, and as required by Section 1813 of the Labor Code, the Contractor shall, as a penalty, forfeit to the District Twenty-Five Dollars ($25.00) for each worker employed in the execution of the Contract by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one calendar day or forty (40) hours in any one (1) calendar week.

Exception: Pursuant to Labor Code Section 1815, work performed by employees of the Contractor and subcontractors in excess of eight (8) hours per day or forty (40) hours during any one week shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1-1/2) times the basic rate of pay.

Labor Code Concerning Forfeiture for Paying Less than Prevailing Wage Rate

The Contractor shall comply with Division 2, Part 7, Chapter 1 of the California Labor Code and shall pay prevailing wage rates. In accordance with Section 1775 and subsequent amendments of the Labor Code, the Contractor shall forfeit as a penalty to the Camrosa Water District, not more than Fifty Dollars ($50.00) 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 the Contractor or by any subcontractor in violation of the provisions of said California Labor Code. In addition to said penalty and pursuant to the said Section 1775 and subsequent amendments, the difference between the 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. Any sums forfeited under the provisions of this section will be deducted from the payments under this Contract by the Camrosa Water District.

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

> "A contractor shall not discriminate in the employment of persons upon public works on any basis listed in Subdivision (a) of Section 12940 of the Government Code, as those bases are defined in Sections 12926 and 12926.1 of the Government Code, except as provided in Section 19240 of the Government Code. Every contractor for public works who violates this section is subject to all the penalties imposed for a violation of this chapter."

Attention is also directed to the requirements of the California Fair Employment and Housing Act (Government Code Sections 12900 through 12996 - Stat. 1980, Chapter 992), to the regulations promulgated by the Fair Employment and Housing Commission to implement said Act, and to the nondiscrimination, affirmative action and equal employment opportunity requirements of these Specifications.

The Contractor or subcontractor shall comply with the Copeland "Anti-Kick Back" Act (18 U.S.C. 874) as supplemented in the Department of Labor regulations (29 CFR, Part 3). This act provides that each Contractor or subcontractor shall not induce, by any means, any person employed in the construction, completion, or repair of public works, to give up any part of the compensation due that person. Any suspected or reported violation will be reported to the appropriate Federal Agency for proper action.

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

The Contractor shall comply with the General Prevailing Wage determination made by the Director of Industrial Relations, pursuant to California Labor Code, Division 2, Part 7, Chapter 1, Article 2.

Section 1777.5 requires the Contractor and subcontractors employing tradesmen in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of the public works project and which committee administers the apprenticeship program in that trade for a certificate of approval. The certificate will also fix the hourly non-overtime ratio of apprentices to journeymen that will be used in the performance of the Contract; except for Land Surveyors in which case the ratio shall be not less than one (1) apprentice for each five (5) journeyman. The hourly non-overtime ratio of apprentices to journeymen in such cases shall not be less than one (1) to five (5), if practicable, except:

a) When unemployment in the area of coverage by the joint apprenticeship committee has exceeded an average of fifteen percent (15%) in the ninety (90) days prior to the request for certificate; or

b) When the number of apprentices in training in the area exceeds a ratio of one (1) to five (5); or

c) When the trade can show that it is replacing at least one-thirtieth (1/30th) of its membership through apprenticeship training on an annual basis state-wide or locally; or

d) If assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his/her life or the life, safety or property of fellow employees or the public at large, or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman; or

e) When contracts of general contractors or specialty contractors not bidding for work through a general or prime contractor when the contracts involve less than Thirty Thousand Dollars ($30,000).

The Contractor is required to make contributions to funds established for the administration of apprenticeship programs if the Contractor employs registered apprentices or journeymen in any apprenticeable trade on the Contract and if subcontractors on the public works site are making such contributions.

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

7-3 LIABILITY INSURANCE

Insurance - The Contractor shall meet the following provisions (Sections 1 through 7) relating to insurance coverage:

1. General Conditions - Without limiting the Contractor's indemnification of District, Contractor shall provide and maintain at its own expense the insurance listed under Section 7 (Evidence of Coverage) covering its operations, subject to the following conditions:

   a) The District and its boards, officers, agents, and employees shall be included as additional insureds in all liability insurance policies and endorsements thereto except for workers' compensation and professional errors and omissions. The District shall be named loss payee as its interest may appear in all property insurance.

b) In carrying out his/her work, the Contractor shall at all times exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed, and be in compliance with all applicable federal, state and local statutory and regulatory requirements including California Department of Industrial Relations (Cal/OSHA) regulations; and the U.S. Department of Transportation Omnibus Transportation Employee Testing Act. Safety precautions, as applicable, shall include but shall not be limited to: adequate life protection and life saving equipment; adequate illumination; instructions in accident prevention for all employees, such as the use of machinery guards, safe walkways, scaffolds, ladders, bridges, gang planks, confined space procedures, trenching and shoring, fall protection, and other safety devices; equipment and wearing apparel as are necessary or lawfully required to prevent accidents, injuries, or illnesses; and adequate facilities for the proper inspection and maintenance of all safety measures.

c) The Contractor shall be responsible for the safeguarding of all utilities. At least two working days before beginning work, the Contractor shall call the Underground Service Alert (USA) in order to determine the location of sub-structures. The Contractor shall immediately notify Camrosa and the utility owner if he/she disturbs, disconnects, or damages any utility.

d) In accordance with Section 6705 of the California Labor Code, the Contractor shall submit to the Camrosa specific plans to show details of provisions for worker protection from caving ground during excavations of trenches of five feet or more in depth. The excavation/trench safety plan shall be submitted to and accepted by the Camrosa prior to starting excavation. The trench safety plan shall have details showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. If such a plan varies from the shoring system standards established by the Construction Safety Orders of the California Department of Industrial Relations (Cal/OSHA), the plan shall be prepared by a California registered civil or structural engineer. As part of the plan, a note shall be included stating that the registered civil or structural engineer certifies that the plan complies with the Cal/OSHA Construction Safety Orders, or that the registered civil or structural engineer certifies that the plan is not less effective than the shoring, bracing, sloping or other provisions of the Safety Orders. In no event shall the Contractor use a shoring, sloping, or protective system less effective than that required by said Construction Safety Orders. Submission of this plan in no way relieves the Contractor of the requirement to maintain safety in all areas. If excavations or trench work requiring a Cal/OSHA permit are to be undertaken, the Contractor shall submit his/her permit with the excavation/trench work safety plan to the Camrosa before work begins.

e) Any deductible or self-insured retention must be declared to and approved by the Camrosa. At the option of Camrosa, the insurer shall either reduce or eliminate such deductibles or self-insured retentions.

f) Insurance is to be placed with insurers having a current A.M. Best rating of no less than A:VII or equivalent or as otherwise approved by Camrosa.

g) In the event that the Contractor employs other contractors (sub-contractors) as part of the work covered by this agreement, it shall be the Contractor's responsibility to require and confirm that each sub-contractor meets the minimum insurance requirements specified above.

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

i) Such insurance shall be primary with respect to any insurance maintained by District and shall not call on District's insurance for contributions.

j) With respect to the interests of the District, the Contractor's insurance shall not be canceled nor reduced in coverage or limits until after thirty (30) days written notice shall have been sent by certified mail, return receipt requested, to the District, 7385 Santa Rosa Road, Camarillo, California 93012, and shall contain an unequivocal clause so stating.

k) A District approved endorsement or certified copy of insurance policies providing coverage shall be submitted to and approved by the District's Business Manager prior to commencement of any work or tenancy. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03 or ISO CG 25 04 endorsement provided to Camrosa or the general aggregate limit shall be twice the required occurrence limit.

2. Workers' Compensation - The Contractor shall procure and maintain during the life of the contract workers' compensation insurance or a valid certificate of consent to self-insure for all its employees engaged on or at the site of the project. In case any of the work is sublet, the Contractor shall require all subcontractors to similarly provide workers' compensation insurance for all the latter's employees unless such employees are covered by protection afforded by workers' compensation insurance carried by the Contractor.

The Contractor and all sub-contractors shall insure (or be a qualified self-insured) under the applicable laws relating to workers' compensation insurance, all of their employees working on or about the construction site, in accordance with the

"Workers' Compensation and Insurance Act", Division IV of the Labor Code of the State of California and any Acts amendatory thereof. The Contractor shall provide employer's liability insurance with limits of no less than $1,000,000 each accident, $1,000,000 disease policy limit, and $1,000,000 disease each employee.

By submitting a bid pursuant to these specifications, Contractor hereby certifies that it is aware of the provisions of Section 3700 et seq., of the Labor Code which require every employer to be insured against liability for Workers' Compensation.

3. Aggregate Limits/Blanket Coverage - If any of the required insurance coverage contain aggregate limits or apply to other operations or tenancy of the Contractor outside these specifications, Contractor shall give District prompt, written notice of any incident, occurrence, claim, settlement or judgment against that insurance which may diminish the protection that such insurance affords the District. Contractor shall further take immediate steps restoring such aggregate limits or shall provide other insurance protection for such aggregate limits.

4. Modification of Coverage - The District reserves the right at any time during the term of any contract executed with the Contractor pursuant to these specifications (Contract) to change the amounts and types of insurance required hereunder by giving Contractor ninety (90) days written notice. If such change results in a premium increase in excess of ten percent (10%) to Contractor, District agrees to negotiate additional compensation proportional to the increased benefit to the District.

5. Failure to Procure or Maintain Insurance - Contractor's failure to procure or maintain required insurance program shall constitute a material breach of contract under which the District may immediately terminate the Contract or, at its discretion, procure or renew such insurance to protect the District's interests and pay any and all premiums in connection therewith, and recover all monies so paid from Contractor, or deduct all monies so paid from payments due Contractor.

6. Underlying Insurance - Contractor shall be responsible for requiring indemnification from its employees receiving mileage allowance, consultants, agents, and subcontractors, if any, to protect the District's interests and shall be responsible for ensuring that such persons comply with any applicable insurance statutes. Contractor is encouraged to seek professional advice in this regard.

7. Evidence of Coverage - Evidence of coverage (as checked below) having as a minimum the limits shown must be submitted and approved prior to commencement of work or any tenancy. Amounts shown are Combined Single Limit (CSL). Split limits may be substituted if the total per occurrence equals or exceeds the CSL amount.

	Description	Limits
X	Workers' Compensation	Statutory
	(X) Employer's Liability	$1,000,000

(X) Waiver of Subrogation

X	General Liability (must be written on an Occurrence Form)	$5,000,000 CSL
	(X) Premises and Operations (X) Contractual Liability (X) Independent Contractors (X) Products/Completed Operations (X) Broad Form Property Damage (X) Personal Injury (X) Broad Form Liability Endorsement (X) Explosion Hazard (X) Collapse/Underground Hazard	
X	Automobile Liability (must be written on an Occurrence Form) (X) Owned Automobiles (X) Nonowned/Hired Automobiles ( ) Garagekeeper's Legal Liability	$2,000,000 CSL
X	Property Insurance (X) All Risk Coverage	Value of Structure

7-4 HOLD HARMLESS

1. To the fullest extent permitted by law, Contractor shall indemnify and hold harmless and defend Camrosa, its directors, officers, employees, or authorized volunteers, and each of them from and against:
   a. Any and all claims, demands, causes of action, damages, costs, expenses, losses or liabilities, in law or in equity, of every kind or nature whatsoever for, but not limited to, injury to or death of any person including Camrosa and/or Contractor, or any directors, officers, employees, or authorized volunteers of Camrosa or Contractor, and damages to or destruction of property of any person, including but not limited to, Camrosa and/or Contractor or their directors, officers, employees, or authorized volunteers, arising out of or in any manner directly or indirectly connected with the work to be performed under this agreement, however caused, regardless of any negligence of Camrosa or its directors, officers, employees, or authorized volunteers, except the sole negligence or willful misconduct or active negligence of Camrosa or its directors, officers, employees, or authorized volunteers;

   b. Any and all actions, proceedings, damages, costs, expenses, penalties or liabilities, in law or equity, of every kind or nature whatsoever, arising out of, resulting from, or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of Contractor,

c. Any and all losses, expenses, damages (including damages to the work itself), attorneys' fees, and other costs, including all costs of defense, which any of them may incur with respect to the failure, neglect, or refusal of Contractor to faithfully perform the work and all of the Contractor's obligations under the agreement. Such costs, expenses, and damages shall include all costs, including attorneys' fees, incurred by the indemnified parties in any lawsuit to which they are a party

2. Contractor shall defend, at Contractor's own cost, expense and risk, any and all such aforesaid suits, actions, or other legal proceedings of every kind that may be brought or instituted against Camrosa or its directors, officers, employees, or authorized volunteers.

3. Contractor shall pay and satisfy any judgment, award or decree that may be rendered against Camrosa or its directors, officers, employees, or authorized volunteers, in any and all such suits, actions, or other legal proceedings.

4. Contractor shall reimburse Camrosa or its directors, officers, employees, or authorized volunteers, for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided.

5. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the Camrosa, or its directors, officers, employees, or authorized volunteers

7-5 PERMITS

7-5.1 County of Ventura Encroachment Permit

A County of Ventura Encroachment Permit is required to work within public right-of-way and will be issued at no cost to the Contractor. The expected form of the County of Ventura Encroachment Permit may be found in Appendix C. The Contractor shall adhere to all of the requirements of the issued encroachment permit. Where there are differences between the encroachment permit requirements and requirements otherwise specified in the Specifications, the stricter of the two shall apply unless otherwise allowed by the Owner in writing.

7-5.2 Caltrans Encroachment Permit

When work is proposed within State of California Department of Transportation right-of-way, the District will obtain an Encroachment Permit. However, after contract award, the Contractor shall obtain and pay for an Encroachment Permit Rider at the State of California Department of Transportation, Permit Section, 120 S. Spring Street, Los Angeles, CA 90012. The Contractor will need to show evidence of possessing bonding that meets the requirements of the State of California Department of Transportation. Such bonding costs will be at Contractor's expense.

7-5.3 Other Encroachment Permits

When work occurs in the right-of-way of other entities, the Contractor shall obtain and pay, as required, for an encroachment permit from that entity.

7-6 PROJECT SITE MAINTENANCE

7-6.2.1 Additional Air Pollution Control Requirement

The Contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act of 1970 (42 U.S.C. 7401 et. seq.) as amended. Violations will be reported to the appropriate authorities.

7-6.8 Sound Control Requirements

The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the Contract.

Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without such muffler.

The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 7:00 a.m., shall not exceed a maximum of fifty (50) dba at a distance of fifty (50) feet from the source. This requirement in no way relieves the Contractor from responsibility for complying with local ordinances regulating the noise level.

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

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

7-7 PAYROLL RECORDS

7-7.1 Payroll Documentation

The Contractor's attention is directed to the following provisions of Labor Code Section 1776. The Contractor shall be responsible for compliance with these provisions, including compliance by subcontractors.

(a) The Contractor and each subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, and straight time and overtime hours worked each day and week, and the actual per diem wages paid to

each journeyman, apprentice, worker, or other employee employed in connection with the public work.

(b) The payroll records required under subsection (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

(1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or authorized representative on request.

(2) A certified copy of all payroll records required in subsection (a) shall be made available for inspection or furnished upon request to a representative of the City, the Division of Labor Standards Enforcement and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(3) A certified copy of all payroll records required in subsection (a) or copies thereof shall be made available upon request to the public for inspection. However, a request by the public shall be made through the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to subsection (2), the requesting party shall, prior to being provided the records, reimburse the Contractor, subcontractor, or the entity through which the request was made, the costs of preparation of the requested documents. The public shall not be given access to such records at the principal office of the Contractor.

(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the sample information as the forms provided by the Division.

(d) The Contractor shall file a certified copy of the records required in subsection (a) with the entity that requested such records within ten (10) days after receipt of a written request.

(e) Any copy of records made available for inspection and furnished upon request to the public or any public agency by the District, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor awarded the Contract or performing the Contract shall not be marked or obliterated.

(f) The Contractor shall inform the District of the location of the records required under subsection (a), including the street address, city, and county, and shall, within five (5) working days, provide the District a notice of a change of location and address.

(g) In the event of noncompliance with the requirements of this section, the Contractor shall have ten (10) calendar days in which to comply with this section. Should noncompliance still exist after such ten (10) day period, the Contractor shall, as a

penalty to the state or political subdivision on whose behalf the Contract is made or awarded, forfeit Twenty-Five Dollars ($25.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

LIST OF APPENDICES

APPENDIX A

APPENDIX A

Release on Contract

RELEASE ON CONTRACT

PROJECT NAME: RESERVOIR 3D SITE DRAINAGE

SPECIFICATION NO.: PW 19-04

WHEREAS, by the terms of the Contract dated _____, entered into by the Camrosa Water District and the undersigned, the Contractor agreed to perform certain work for the compensation specified in said Contract; and

WHEREAS, the Contractor represents that said work is fully completed and that final payment is due to the Contractor under terms of said Contract,

NOW, THEREFORE, in consideration of the promises and the payment by the Camrosa Water District to the Contractor of the amount due under the Contract, to wit, the sum of _____ Dollars ($_____), and the additional consideration of One Dollar ($1.00), receipt of which is hereby acknowledged by the Contractor, the Contractor hereby releases and forever discharges the Camrosa Water District of and from all manner of debts, dues, demands, sum or sums of money, accounts, claims, and causes of action, in law and in equity, under or by virtue of said Contract, except as follows (if none, leave blank): _____

_____.

IN WITNESS WHEREOF, the hand and seal of the Contractor have been hereunto set this _____ day of _____, 2019.

This form must be notarized using proper acknowledgment form (see Civil Code Sections 1189, 1190, and 1190a).

_____
Contractor

By _____

Title _____

By _____

Title _____

CONTRACTOR'S AFFIDAVIT OF PAYMENT

PROJECT NAME: RESERVOIR 3D SITE DRAINAGE

SPECIFICATION NO.: PW 19-04

DATE: _____

The undersigned hereby certifies that all workers, and persons employed, all firms supplying materials, and all subcontractors working on the above named project have been paid in full, and there are no bills, invoices, or obligations outstanding against the project for either labor, materials, or equipment furnished except for the following disputed claims for which Notices to Withhold have been filed under the provisions of the Code of Civil Procedure: (If none, leave blank) ____

_____

_____

IN WITNESS WHEREOF, the hand and seal of the Contractor have been hereunto set this _____ day of _____, 2019.

This form must be notarized using proper acknowledgment form (see Civil Code Sections 1189 and 1190).

_____
Contractor Name:

By: _____
Signature of Authorized Representative

Title: _____

By: _____
Signature of Authorized Representative

Title: _____

TECHNICAL PROVISIONS

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. The Contractor shall furnish Submittals for materials and equipment proposed to be incorporated into the Work where required by these Specifications or where requested by the Engineer. The Submittals shall be in accordance with the requirements of the Contract Documents.

B. This Section specifies the general methods and requirements of submissions applicable to the following work-related submittals: Shop Drawings, Product Data, Manuals, Samples, Survey Data, Calculations and Construction or Submittal Schedules. Detailed submittal requirements are specified in other sections of these Specifications.

C. All submittals shall be clearly identified by reference to Specifications Section, Paragraph and Drawing No. or Detail as applicable. Submittals shall be clear and legible and of sufficient size for sufficient presentation of data. The "Submittal Transmittal/Certification Form" and the "P.E. Certification Form" to be used with each submittal are included at the end of this Section.

1.02 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Shop Drawings

1. Shop Drawings include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation (working) drawings, design calculations, lists, graphs, operating instructions, schedule information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports, including performance curves and certifications, as applicable to the Work.

2. All details on Shop Drawings submitted for review shall show clearly the relation of the various parts of the Work and control lines, and where correct fabrication of the Work depend upon field measurements, such measurements shall be made and noted on the drawings before being submitted for review.

3. At the request of the Engineer, submittals for equipment specified under Divisions 1, 2, 11, and 13 shall include a listing of all installations where identical or similar

equipment has been installed and been in operation for a period of at least five years unless otherwise indicated as longer in these Specifications.

B. Product Data

1. Product data specified in individual sections include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliance and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Work.

2. Each copy of product data must be clear and legible with the product intended to be supplied clearly marked where multiple products are available.

C. Samples

1. Samples specified in individual sections include, but are not necessarily limited to, physical examples of the work, such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Owner for independent inspection and testing, as applicable to the Work.

D. Statement of Qualifications

1. Where required by the Specifications, provide sufficient information on work for which qualifying experience is sought, including job name, contact name, contact phone number, and job description.

2. Work for which an individual or company wishes to submit as qualifying experience shall not be subcontracted work and must have been performed by the individual or the company's own forces.

3. All qualifying experience must be current (e.g., if 5 years of experience is required, then all work for which qualifying experience is to be considered must have been performed in the last 5 contiguous years).

4. Accurate, adequate and verifiable information, which demonstrates the Contractor's or the Subcontractor's experience, as required in the Specifications. This includes submittals for the Contractor's Superintendent, Project Manager, third party traffic control company and others as specified in the Specifications.

5. Contact information used for qualifying experience shall be verified by the Contractor as being accurate and current. Failure to submit verifiable and accurate information may result in rejection of the entire submittal.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor shall review Shop Drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:

1. Field measurements

2. Field construction criteria

3. Catalog numbers and similar data

4. Conformance with the Contract Documents

B. Each Shop Drawing, sample and product data submitted by the Contractor shall have as the first sheet affixed to it a properly filled out Submittal Transmittal/Certification Form which includes a certification statement signed by the Contractor which says:

"Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable shop drawings and all Contract requirements."

A digital copy of the Submittal Transmittal/Certification form is available to the Contractor upon request in both Microsoft Word and Adobe Portable Document Format (PDF) formats.

C. Shop Drawings and product data sheets 11-in. x 17-in. or 8 1/2 in. x 11 in. shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Engineer a copy of each submittal transmittal sheet for Shop Drawings, product data and samples at the time of submittal of said drawings, product data and samples to the Engineer.

D. The Contractor shall utilize a 9-character submittal identification numbering system in the following manner:

1. The first three digits shall be the numbers 001-999 to sequentially number each initial separate item or drawing submitted.

2. The next five digits shall be the applicable Specifications Section Number.

3. The next character shall be a letter, A-Z, indicating the submission, or resubmission of the same drawing, i.e., A=1st submission, B=2nd submission, C=3rd submission, etc.

   A typical submittal number would be as follows: 018-13122-B

   018 = The eighteenth initial submittal
   13122 = Specifications Section number
   B = The second submission (first resubmission) of that particular Shop Drawing

E. Engineer reviewed and accepted submittal that contains deviations from the requirements of the Contract Documents that are not brought to the attention of the Engineer in writing may result in the removal and/or replacement of work at the sole expense of the Contractor. In no way shall an Engineer reviewed and accepted submittal be construed as acceptance of deviations from the requirements of the Contract Documents not brought to the attention of the Engineer. Submittals that contain deviations from the requirements of the Contract Documents shall be accompanied by a separate letter explaining the deviations. The Contractor's letter shall:

1. Cite the specific Contract requirement, including the Specification Section and paragraph number, for which approval of a deviation is sought.

2. Describe the proposed alternate material, item, or construction and explain its advantages and/or disadvantages to the Owner.

3. State the reduction in Contract Amount, if any, which is offered to the Owner.

F. The Contractor has primary responsibility of submitting and providing work that complies with the requirements of the Contract Documents. That responsibility cannot be delegated in whole or in part to subcontractors or suppliers. Neither the Engineer's favorable review nor the Engineer's failure to notice or comment on deficiencies in the Contractor's submittals shall relieve the Contractor from the duty to provide work, which complies with the requirements of the Contract Documents.

G. The Contractor shall not deviate in any way from the design, details, or dimensions shown on accepted Shop Drawings or data without the written consent of the Engineer. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

H. Project work, materials, fabrication, and installation shall conform to Engineer reviewed and accepted Shop Drawings, applicable samples, and product data.

I. If an accepted submittal has a material, process or procedure which has been used in the Work and the Contractor wishes to use another material or process, then the new

submittal shall be submitted under the same number with and appended letter starting at *a*. For example, if Submittal 001-02642-B has been approved and the Contractor has installed some of its material, a subsequent Submittal for a replacement material will be submitted as 001a-02642-A. The subsequent submittal shall also indicate the limits or locations the previous submittal was used and the reason for the replacement.

J. If an accepted submittal has a material, process or procedure which has not been used and the Contractor wishes to substitute with a different material, process or procedure, then the new submittal shall be submitted under the same submittal number as a resubmittal of the submittal it is replacing. The subsequent submittal shall also indicate why the originally approved material, process or procedure is being replaced.

K. Shop Drawings shall be clear and legible. Facsimile copies or copies that are not easily legible in the opinion of the Owner or Engineer may be rejected prior to review for resubmittal of more legible documents.

1.04 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other contractor.

B. Each submittal, appropriately coded, will be returned to the Contractor within fifteen (15) Working Days following receipt of submittal by the Engineer.

C. Number of submittals required:

1. Shop Drawings: Three copies for the Owner, one copy for the Engineer and any additional copies, to be returned to the Contractor, to a maximum of six total submitted copies.

2. Product Data: Four copies for the Owner, one copy for the Engineer and any additional copies to be returned to the Contractor, to a maximum of seven total submitted copies.

3. Samples: Submit the number stated in the respective Specifications sections.

4. Statement of Qualifications: Submit the number stated in the Specifications or three copies if not otherwise specified.

D. Submittals shall contain:

1. A properly filled out Submittal Transmittal/Certification Form containing:

   a. The date of submission and the dates of any previous submissions

   b. The project title and specifications number

c. Contractor identification

d. The names and telephone numbers of the supplier and manufacturer

e. Submittal identification number

2. Field dimensions, clearly identified as such

3. Applicable standards, such as ASTM or Federal Specification numbers

4. Identification of deviations from Contract Documents

5. Identification of revisions on resubmittals

6. Certifications, as required

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

A. The review of Shop Drawings, data, and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:

1. as permitting any departure from the Contract requirements.

2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.

3. as approving departures from details furnished by the Owner, except as otherwise provided herein.

B. Should the Contractor provide information to the Engineer outside of a submittal (informal review), the Contractor will be notified prior to the review that the Engineer will count the review as a submittal for purposes defined in Paragraph 1.05.J.1 of this Section. The Contractor can then decide to withdraw the information and submit it as a formal submittal or agree that the informal review will be counted as a submittal review. Informal reviews do not require response by the Engineer within the time limit defined in Paragraph 1.04.B of this Section.

C. The Contractor remains responsible for details and accuracy, for coordinating the Work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

D. If the Shop Drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which the Engineer finds to be in the interest

of the Owner and to be so minor as not to involve Extra Work, the Engineer may return the reviewed drawings without noting an exception.

E. Submittals will be returned to the Contractor under one or more of the following categories. Examples of the "Submittal/Shop Drawing Review" statements are included at the end of this Section.

"NO EXCEPTION TAKEN" is assigned when there are no notations or comments on the submittal. The Contractor is thereby allowed to begin fabrication and/or procurement of the material/equipment.

"MAKE CORRECTIONS NOTED - NO RESUBMITTAL REQUIRED" is assigned when notations or comments are marked on the submittal. The Contractor shall make the noted corrections, but no review resubmission of the submittal is required. The Contractor is thereby allowed to begin fabrication and/or procurement of the material/equipment; however, all notations and comments must be incorporated into the final product.

The Contractor may be requested to provide a final submittal.

"MAKE CORRECTIONS NOTED AND RESUBMIT" is assigned when the submittal notations or comments are marked on the submittal. The Contractor shall make the noted corrections and resubmit the entire submittal. The Contractor is not allowed to begin fabrication and/or procurement of the material/equipment.

"REJECTED-RESUBMIT" is assigned when the submittal is incomplete or does not meet the requirements of the Contract Documents as determined by the Engineer. The submittal may be only partially reviewed or not reviewed at all. The Contractor shall make necessary changes to bring the submittal into compliance with the Contract Documents and then resubmit the entire submittal package for Engineer's review. The Contractor shall not begin fabrication and/or procurement of the material/equipment.

"NOTED-COPY RETAINED" is assigned when the submittal does not require any review acceptance by the Engineer or Owner. Copies of such submittal will be retained for Owner's and Engineer's files.

F. Resubmittals will be handled in the same manner as first submittals. On resubmittals, the Contractor shall direct specific attention, in writing, on the letter of transmittal and on resubmitted Shop Drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer on previous submissions. Any such revisions that are not clearly identified within the submittal package shall be made at the risk of the Contractor. The Contractor shall make corrections to any work

done because of this type of revision that is not in accordance with the Contract Documents as may be required by the Owner.

G. Partial submittals may not be reviewed. The Engineer will be the sole judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor, and will be considered "Rejected" until resubmitted. The Engineer may at his/her option, provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

H. Resubmittals shall be complete in all respects. Each comment made by the Engineer shall be addressed and reflected either by a change in submittal documents or by explanation by the Contractor in the transmittal letter. The Contractor's failure to address all comments may result in the submittal being returned only partially reviewed. Such partial review shall be counted as a complete review for purposes of Paragraph 1.05.J of this Section.

I. Resubmittals shall not contain markings of the Engineer from previous submittals.

J. Repetitive Review

1. Shop Drawings and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Engineer and at the Contractor's expense. The Contractor shall reimburse the Owner for all such fees invoiced to the Owner. Submittals are required until they are reviewed and returned with no resubmittal required.

2. Any need for more than one resubmission or any other delay in obtaining Engineer's review of submittals will not entitle the Contractor to Extra Work.

3. If the Contractor considers any correction indicated on the Shop Drawings to constitute a change to the Contract Documents, the Contractor shall give prompt written notice thereof to the Owner and Engineer. Failure to give such written notice will indicate the Contractor's acceptance of said correction and will not entitle the Contractor to Extra Work.

K. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Owner or Engineer.

L. In the event that the Shop Drawings are reviewed and accepted by the Engineer but do contain deviations from the Contract Documents which are not specifically noted by the Contractor as specified in Paragraph 1.03F above, the Owner or Engineer, at their discretion, may reject such work, product or procedure at any time. The Contractor will not be granted Extra Work due to his failure to specifically notify the Engineer of a deviation from the Contract Documents.

M. Within thirty (30) Calendar Days after acceptance by the Engineer of any data or shop assembly or layout drawing, a final submittal shall be made incorporating all corrections noted by the Engineer. This final submittal shall be clearly noted in the Contractor's transmittal as being a final submittal of accepted drawings or data and shall consist of four clear legible copies of all information on sheets up to double standard size, 11-inch x 17-inch. Final submittals shall be forwarded directly to the Engineer.

N. One product or process for a particular application or portion of work may be submitted and will be reviewed by the Engineer in accordance with these Specifications. Products or processes submitted and intended to be an equivalent replacement or alternative to an already submitted product or process whether that already submitted product or process has been reviewed and accepted or not may, at the discretion of the Owner, be reviewed at the Contractor's expense. The Contractor, at the Owner's discretion, may be required to reimburse the Owner for all such fees invoiced to the Owner.

1.06 DISTRIBUTION

A. Distribute reproductions of accepted Shop Drawings and copies of accepted product data and samples, where required, to the Site file and elsewhere as directed by the Owner.

1.07 SCHEDULES

A. Provide all schedules required in Section 01310.

1.08 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

A. If specifically required in other sections of these Specifications, the Contractor shall submit a P.E. Certification Form for each item required, on the form at the end of this Section, completely filled in and stamped.

1.09 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities or within the time specified in the individual work sections of the Specifications, whichever is earlier, so that the installation will not be delayed by processing times, including rejection and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No Extra Work will be authorized because of the Contractor's failure to transmit and obtain acceptance of submittals sufficiently in advance of the work.

B. No fabrication, installation or other work requiring a Shop Drawing or sample shall be performed in advance of the receipt by the Contractor of the Shop Drawings and data favorably reviewed by the Engineer. The Contractor shall not deviate in any way from

the design, details, or dimensions shown on said accepted drawings or data without written consent of the Engineer.

1.10 QUALITY CONTROL SUBMITTALS

A. Certificates:

1. Manufacturer's Certificate of Compliance:

a. When specified in individual Specifications sections or where products are specified to a recognized standard or code, submit prior to shipment of product or material to the Site.

b. Engineer may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.

c. Signed by product manufacturer certifying that materials, manufacture, and product specified conform to or exceed specified requirements and intent for which product will be used. Submit supporting reference data, affidavits, and certifications as appropriate.

d. May reflect recent or previous test results on material or product, but must be acceptable to Engineer.

2. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by laws and regulations or governing agency or specified in the individual Specification sections.

B. Statements of Qualification: Evidence of qualification, certification, or registration, as required in these Contract Documents to verify qualifications of engineers, materials testing laboratories, specialty subcontractors, trades, specialists, consultants, installers, and other professionals.

C. Written Test Reports of Each Test and Inspection: As a minimum, include the following:

1. Date of test and date issued, project title and specifications number, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.

2. Date and time of sampling or inspection and record of temperature and weather conditions.

3. Identification of product and Specifications section, location of sample, test or inspection in the project, type of inspection or test with referenced standard or code, certified results of test.

4. Compliance with Contract Documents and identifying any corrective action necessary to bring materials and equipment into compliance.

5. Provide an interpretation of test results, when requested by Engineer.

1.11 SUBMITTAL LOG

A. The Contractor shall prepare and maintain an accurate submittal log for the duration of the project. The Contractor shall submit six copies of the initial submittal log listing all required submittals within 30 Calendar Days after Notice to Proceed. The Contractor shall submit six copies of the updated submittal log monthly and upon request of the Engineer or the Owner. The submittal log shall contain a listing of all submittals required by the Contract Documents and shall include the following.

1. Submittal identification number
2. Description of submittal item
3. Projected submission date
4. Actual submission date
5. Date returned by the Engineer
6. Notation of the Engineer's response
7. Notation if resubmittal or record copy is required

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

P. E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of California and that he/she has been employed by _____ (Name of Contractor) to design: _____ located in _____, in accordance with Specification Section _____ for the Construction of Reservoir 3D Site Drainage. The undersigned further certifies that he/she has performed the design of the

_____

_____

_____

_____

_____

_____

that said design is in conformance with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to Camrosa Water District (Owner), whose address is 7385 Santa Rosa Road, Camarillo, California, 93012 or the Owner's representative within seven (7) Calendar Days following written request therefor by the Owner.

_____	_____
P.E. Name (Printed) & Title	Contractor's Name (Printed) & Title
_____	_____
P.E.'s Signature	Contractor's Signature
_____	_____
Address	Address

Submittal Transmittal/Certification Form

Owner: Camrosa Water District

Project Name: Reservoir 3D Site Drainage

Specification No.: PW 19-04

To: Perliter & Ingalsbe
430 West Colorado Street
Glendale, California 91204
Attn: Rean David Kunitake

From:
Phone No.:
(Contractor's Name, Address, & Phone No.)

Submittal #:_____ Copies: _____

Submittal # - Specification Section - Submission

Description: _____

_____

Supplier:_____ Phone No:_____

Manufacturer:_____ Phone No:_____

Additional Attachments:

- ☐ PE Certificate Required
- ☐ Identification of Revisions
- ☐ Field Dimensions Clearly Identified
- ☐ Identification of Deviations from Contract Docs.
- ☐ Certification Attached
- ☐ Other _____

Remarks: _____

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable accepted Shop Drawings and all Contract requirements.

By:_____ _____ _____

Signature Print Name Date

Sample Shop Drawing Review Statements

NO EXCEPTION TAKEN

Date

PERLITER & INGALSBE
By:

MAKE CORRECTIONS NOTED – NO RESUBMITTAL REQUIRED

Date

PERLITER & INGALSBE
By:

MAKE CORRECTIONS NOTED AND RESUBMIT

X *Date* X

PERLITER & INGALSBE
By:

REJECTED – RESUBMIT

X *Date* X

PERLITER & INGALSBE
By:

NOTED – COPY RETAINED

Date

PERLITER & INGALSBE
By:

END OF SECTION

TECHNICAL PROVISIONS

SECTION 01310

PROGRESS SCHEDULES

PART 1 - GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This Section specifies the general requirements for the preparation and submittal of the schedule of work.

1.02 SUBMITTALS

A. Submitted progress schedules shall be in Microsoft Project or approved equivalent, indicating the order in which the Contractor proposes to complete the Work, in strict compliance with the Contract Documents. Each schedule shall be subject to the approval of the Owner. Submit schedules on 11"x17" single sided paper along with project data file in electronic format. Font shall be no smaller than 10 point and all schedule components and graphics shall be clear and easy to read.

B. Preliminary Progress Schedule: Submit no later than the Pre-Construction Meeting.

C. Progress Schedule: Submit adjusted schedule or confirm validity of current schedule with each monthly Partial Estimate and at such other times as necessary to reflect (i) progress of the Work to within 5 Working Days prior to submission; (ii) changes in work scope and activities modified since submission; (iii) delays in submittals or resubmittals, deliveries, or work; (iv) adjusted or modified sequences of work; (v) other identifiable changes; and (vi) revised projections of progress and completion. The Owner's receipt and acceptance of the updated schedule shall be a condition precedent to the issuance of any portion of a progress payment for the preceding month.

D. Four-Week Schedule: Submit updated four-week schedules every Friday by 4 p.m. showing planned activities for the next four weeks.

1.03 PROGRESS OF THE WORK

A. If Contractor fails to complete activity by its latest scheduled completion date and this failure may cause the Contractor to fail to complete the Work or portions of the Work, as applicable, within the Time(s) for Completion or by the Fixed Calendar Dates set forth in the Contract Documents, the Contractor shall, within 7 Calendar Days of such failure, submit a written statement as to how Contractor intends to correct nonperformance and return to the acceptable current progress schedule. Actions by Contractor to complete Work within the Time(s) for Completion or by the Fixed Calendar Dates will not be considered Extra Work.

1.04 PRELIMINARY PROGRESS SCHEDULE

A. As a minimum, submit two bar charts as follows:

1. 60-Day Plan: Show major initial activities including, but not limited to, mobilization, permits, submittals and submittal review periods for early product procurement and long lead-time items, initial site work, and other activities anticipated in the first 60 Calendar Days after the Notice to Proceed.

2. Project Overview Plan: Show major components of the Work and the sequence relations between major components and subdivisions of major components. The chart shall indicate the relationship and time frames in which the various facilities will be made complete and placed into service. Sufficient detail shall be included for the identification of subdivisions of major components into such activities as:

   a. Material submittals and procurement
   b. Pumps installation
   c. Pressure regulating vault installation
   d. Meter vault installation
   e. Pipe installation
   f. Connections to existing pipeline
   g. Electrical and control panel installation
   h. Electrical pull box installation
   i. Electrical service conduit installation
   j. Southern California Edison pad and transformer installation
   k. Paving
   l. Abandonment of existing vault
   m. Existing SCE service disconnect
   n. Testing & disinfection
   o. Completion of all work

B. Planned durations and start dates shall be indicated for each work item subdivision. Each major component and subdivision component shall be accurately plotted on time scale sheets.

C. The preliminary progress schedule, when accepted by the Owner, will be the initially acceptable schedule.

1.05 PROGRESS SCHEDULE

A. General:

1. Schedule(s) shall reflect work logic sequences, restraints, delivery windows, review times, specified Fixed Calendar Dates for completion of portions of the Work, and the Time(s) for Completion set forth in the Contract Documents and shall begin with the date of Notice to Proceed and conclude with the date of the Contractor's submittal of his Certificate of Completion.

2. The schedule requirement herein is the minimum required. Contractor may prepare a more sophisticated schedule if such will aid Contractor in execution and timely completion of the Work.

3. Prepare schedule based on the work hours allowed by the Contract Documents.

4. Use Microsoft Project latest version or an approved equivalent software.

5. Adjust or confirm schedules on a monthly basis.

6. Float time is a project resource available to both parties to allow for completion of the Work or portions thereof within the Time(s) for Completion or by Fixed Calendar Dates, as applicable.

7. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited and use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of Owner and Contractor.

8. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs which (i) impacts project's critical path, (ii) consumes available float or contingency time, and (iii) extends the Work beyond the Time(s) for Completion.

B. Submittal of Schedules

1. Formatted schedule as described in 1.05.C shall be submitted to the Owner no later than the Pre-Construction Meeting. Subsequent schedules shall be submitted within the first five days of each month.

2. Provide 4 hardcopies of each submitted schedule and one digital copy in Adobe Acrobat .pdf format on a Microsoft Windows platform compatible computer compact disc or via e-mail to the District's Project Manager.

3. Camrosa reserves the right to withhold payment of a monthly progress payment if a schedule update is not submitted with the Partial Estimate. If Camrosa does not withhold payment in one month, it still reserves the right to do so in any subsequent month if a schedule is not submitted.

C. Format:

Schedules to be submitted shall follow the format described as follows unless a different format is approved by the Owner:

1. Bar Chart Schedule, to include at least:

a. Identification and listing in chronological order of those activities reasonably required to complete the Work, including, but not limited to, subcontract work, major equipment design, fabrication, factory testing, and delivery dates, including required lead times for Owner-furnished products, move-in and other preliminary activities, equipment and equipment system test and startup activities, project closeout and cleanup, and specified work sequences, constraints, and Time(s) for Completion and Fixed Calendar Dates. Listings to be identified by Specifications Section number.

b. Identify (i) horizontal time frame by year, month, and week, (ii) duration, early-start, and completion for each activity and sub-activity, and (iii) critical activities and project float.

c. Sub-schedules to further define critical portions of the Work.

d. Show overall percent complete, projected and actual, and completion progress by listed activity and sub-activity.

1.06 CLAIMS FOR ADJUSTMENT OF CONTRACT TIME

A. Where Owner has not yet rendered formal decision on Contractor's claim for adjustment of the Time(s) for Completion and parties are unable to agree as to amount of adjustment to be reflected in progress schedule, Contractor shall reflect that amount of time adjustment in progress schedule as Owner may accept as appropriate for the interim. It is understood and agreed that such interim acceptance by Owner will not be binding and will be made only for purpose of continuing to schedule work until such time as formal decision as to an adjustment, if any, of the Time(s) for Completion acceptable to the Owner has been rendered. Contractor shall revise progress schedule prepared thereafter in accordance with Owner's formal decision.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

TECHNICAL PROVISIONS

SECTION 01510

TEMPORARY CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. It shall be the Contractor's responsibility to provide plant and equipment that is adequate for the performance of the Work under this Contract within the time specified. All plant and equipment shall be kept in satisfactory operating condition and shall be capable of safely and efficiently performing the required work, and shall be subject to inspection and approval by the Owner at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of Cal-OSHA Construction Safety Orders. The Contractor shall arrange with the appropriate utility agencies for temporary connections to the utilities. The Contractor is responsible for extending any utility services to the required point of use. In addition, Contractor shall coordinate and provide any temporary equipment as required by the County of Ventura encroachment permit.

B. Type of Facilities: The types of temporary facilities required for general use at the Site may include but are not limited to the following:

Water service
Sanitary facilities
Electric power service
Telephone service

C. Scheduled Uses: The Contractor shall schedule the implementation and termination of service for each temporary utility or facility.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The Contractor shall provide either new or used materials and equipment, which are in substantially undamaged condition and without significant deterioration and which are recognized in the construction industry, by compliance with appropriate standards, as being suitable for intended use in each case.

PART 3 - EXECUTION

3.01 GENERAL

A. Wherever feasible, the Contractor shall engage the utility company to install temporary utility service to the project, or as a minimum, to make connection to existing utility service and shall locate services where they will not interfere with the Work, including installation of permanent utility services.

B. The Contractor shall maintain temporary services as installed for required period of use and shall relocate, modify or extend as necessary from time to time during that period as required to accommodate the Work.

C. The Contractor shall be responsible for all costs of installation, maintenance, removal and usage of any utility throughout the project.

D. All temporary utility installations shall meet, at minimum, all applicable state, local and trade codes.

3.02 ELECTRICAL POWER SERVICE

A. Power: The Contractor shall provide all necessary power required for its operations under the Contract, and shall provide and maintain all temporary power lines required to perform the Work in a safe and satisfactory manner, at no additional cost to the Owner.

B. Construction Lighting: All work conducted at night or under conditions of deficient daylight shall be suitably lighted to ensure proper work and to afford adequate facilities for inspection and safe working conditions. Lighting shall be shielded so that it does not glare into nearby residences.

3.03 WATER SUPPLY

A. The Owner shall make available, at the Owner's own expense, a supply of potable water for the purpose of constructing all of the works under these Contract Documents. Contractor is required, at their expense, to make all connections for obtaining supply.

B. The Owner does not guarantee that the water provided by the Owner will meet the requirements of the Contractor, including that of pressure, flow rate, or location of connection points.

C. The Contractor, at no additional cost to the Owner, shall provide and operate all pumping facilities, pipelines, backflow preventers, valves, storage tanks, and all other equipment necessary for the adequate development, conveyance, and operation of the water supply system. Water used for domestic purposes shall be free of contamination and shall conform to the requirements of the State and local authorities for potable water. The

Contractor shall be solely responsible for the adequate functioning of its water supply system and shall be solely liable for any claims arising from the use of same, including discharge or waste of water therefrom.

D. Non-District Owned Water Connections: The Contractor shall not make connection to, or draw water from, any fire hydrant or facility not owned by the Owner without first obtaining written permission of the authority having jurisdiction over the use of said fire hydrant or facility and from the agency owning the affected water system. For each such connection made, the Contractor shall first attach to the fire hydrant or pipeline a tested and certified backflow prevention assembly and a meter, if required by the said authority, of a size and type acceptable to said authority or agency.

E. District Owned Water Connections: There are ? local points of connection that the contractor will be allowed to use. They are:

1. ?

Prior to making any connection, the Contractor shall request for connection at least 1 week in advance of work requiring the connection and obtain written permission from the District. For each such connection made, the Contractor shall first determine how to connect to the existing piping and obtain written approval of method from the Owner. Following connection by the Contractor, a tested and certified backflow prevention assembly and a meter of a size and type acceptable to the Owner shall be attached. Owner provided water shall be used only for the project under these Contract Documents.

F. Potable Water: All drinking water on the site during construction shall be furnished by the Contractor and shall be bottled water or water furnished in approved dispensers. Notices shall be posted conspicuously throughout the Site warning the Contractor's personnel that piped water may be contaminated.

3.04 INSTALLATION OF SANITARY FACILITIES

A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of Contractor's employees and shall be available for the Owner's use. Toilets at construction sites shall conform to the requirements of Section 1526 of the Cal/OSHA Construction Safety Orders.

B. Sanitary and Other Organic Wastes: The Contractor shall establish a regular weekly collection of all sanitary and organic wastes, and more frequently if required. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the Site in a manner satisfactory to the Owner and in accordance with all laws and regulations pertaining thereto.

3.05 INSTALLATION OF COMMUNICATIONS

A. Traffic Control Telephone Services: The Contractor shall provide and maintain at times required during the progress of the Work, cellular telephone service for any flagperson(s) present and actively performing work on the Site where flagging required traffic controls are installed. The Contractor shall physically verify that the cellular service selected by the Contractor will provide clear signal to the flagperson(s). Maintenance of sufficient battery charge for the cellular telephone and spare charged batteries to be operational at all times during flagging operations, including 24 hour service over long periods of time, shall be the responsibility of the Contractor. All flagpersons who are responsible for communicating on the cellular telephone must speak clearly and have a good understanding of the English language.

3.06 TEMPORARY VENTILATION

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases.

3.07 OPERATIONS AND TERMINATIONS

A. Termination and Removal: When need for a temporary facility or a substantial portion thereof has ended or when its service has been replaced by use of permanent services, the Contractor shall promptly remove installation unless requested by Owner to retain it for a longer period. When not in use, storage of temporary facilities within the public right-of-way shall not be allowed. The Contractor shall complete and restore work that may have been delayed or affected by installation and use of temporary utilities, including repairs to construction and grades and restoration and cleaning of exposed surfaces.

B. Removal of Water Connections: Before final acceptance of the Work on the project, all temporary facilities, connections and piping installed by the Contractor shall be entirely removed, and all affected improvements shall be restored to their original condition or better to the satisfaction of the Owner and to the agency owning the affected utility.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 02140

DEWATERING AND DRAINAGE

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Design, furnish, install, operate, monitor, maintain and remove a temporary dewatering system as required to lower and control water levels below subgrades of excavations to permit construction in the dry.

B. Furnish, install, maintain and remove temporary surface water control measures adequate to drain and remove groundwater and surface water entering excavations.

C. Dewatering water must be put to beneficial use. See Paragraph 3.03.Q.

1.02 CONTRACTOR DESIGN AND RESPONSIBILITY

A. Contractor is responsible for:

1. Design and execution of methods for controlling surface water and groundwater.

2. Collection and transportation of water removed from excavations and beneficial use of such water for dust control or irrigation or legal disposal.

3. Damage to properties, buildings or structures, sewers and other utility installations, or pavements.

4. Work that may result from dewatering or surface water control operations.

B. Design review and field monitoring activities by the Owner or by the Engineer shall not relieve the Contractor of his/her responsibilities for the Work.

1.03 SUBMITTALS

A. Submit to the Engineer, in accordance with Section 01300, detailed plans of the proposed dewatering method, as specified in Paragraph 3.03 below. The plan shall include the proposed method of abandoning dewatering wells and location for use of water generated from excavation dewatering activity.

1.04 DEFINITIONS

A. Where the phrase "in-the-dry" is used in this Section, it shall be defined to mean a soil condition such that the groundwater has been dewatered to a level 6 inches below the bottom of excavation and the water allowed to drain from the soil. If the bottom of excavation appears questionable as determined by the Owner, the Contractor shall excavate a pothole in the bottom of the excavation to determine the actual groundwater elevation at no additional cost to the Owner.

1.05 FINES

A. The Contractor shall bear the costs of any fines levied against the Contractor or the Owner for failure to comply with applicable laws, regulations, provisions and requirements during or as a result of construction under this Contract due to the Contractor's negligent acts.

1. The Owner will retain from the Contractor's Progress Payment, monies necessary to pay such fines levied against the Owner plus 25 percent of such fines for potential costs of coordination and administration efforts, and acquiring technical and legal advice.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe for observation wells, if required, shall consist of minimum 1-inch ID, Schedule 80 PVC pipe and machine slotted PVC well points, maximum slot size 0.020-inches.

B. Desilting tank(s) of appropriate size shall be provided, if required, to handle and hold surface and groundwater prior to beneficial use.

C. Geotextile filter fabric shall be non-woven polypropylene such as Propex Geotex 601, TenCate Mirafi N-Series 160N, and Thrace-Linq 150EX or approved equivalent.

PART 3 - EXECUTION

3.01 GENERAL

A. Control surface water and groundwater such that excavation to final grade is made in-the-dry, the bearing soils are maintained undisturbed, and softening and/or instability or disturbance due to the presence or seepage of water does not occur. All construction and backfilling shall proceed in-the-dry, and flotation of completed portions of work shall be prohibited.

3.02 SURFACE WATER CONTROL

A. Construct surface water control measures, including dikes, ditches, sumps and other methods to prevent flow of surface water into excavations.

3.03 EXCAVATION DEWATERING

A. At all times during construction, furnish and maintain proper equipment and facilities to promptly remove and dispose of properly all water within or entering excavations. Excavations shall be kept dry, so as to obtain a satisfactory undisturbed subgrade foundation condition until the fill, structure or pipes to be built thereon have been completed to such an extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.

B. Excavation and dewatering shall be accomplished by methods that preserve the undisturbed state of subgrade soils. Excavations may be made by machinery to, or just below, the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils that become soft, loose, "quick," or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by crushed rock wrapped in non-woven polypropylene geotextile filter fabric material as required by the Owner at the Contractor's expense.

C. Clay and organic silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use care during the excavation of the last 1 foot of depth.

D. All trenches and excavations shall be dewatered prior to excavation to maintain a water level at least six (6) inches below the bottom of anticipated excavation.

E. All excavations shall be maintained in-the-dry at all times during the course of the Work. Water level will not be allowed to rise in the excavation area at any time until backfill is completed and as additionally required in this Section.

F. Dewatering pipes, desilting tank(s), monitoring wells and other associated dewatering equipment shall be within easements for this project shown on the Drawings or the road right-of-way, as approved by the agency having jurisdiction. No equipment shall be constructed in private right-of-way without written permission from the owner of the property. Permission to place dewatering equipment within property that is not specifically public road right-of-way or easements will require the Contractor to obtain written permission or temporary easement from the owner of the property. No Extra Work will be due the Contractor for obtaining additional construction area(s).

G. Pipe and concrete shall not be laid in water or submerged. Water shall not flow over new concrete structures within 3 Calendar Days after placement.

H. Dewater and excavate, at all times, in a manner that does not cause loss of ground or disturbance to the pipe bearing soil or soil which supports overlying or adjacent structures. Dewatering operations shall continue through work times and non-work times if open excavation will become flooded without dewatering operations.

I. Prevent flotation of pipe by promptly placing backfill.

J. At all times, dewatering shall be conducted in such a manner as to preserve the natural undisturbed capacity of the subgrade soils at proposed bottom of excavation. If the subgrade of the trench bottom or excavation becomes disturbed due to inadequate drainage, excavate below normal grade as directed by the Owner and refill with crushed rock at the Contractor's expense.

K. Evaluate the impact of the anticipated subsurface soil/water conditions on the proposed method of excavation and removal of water.

L. Where groundwater level is above the proposed bottom of excavation level, it is expected that some type of pumped dewatering system will be required for pre-drainage of the soils prior to final excavation and for maintaining the lowered groundwater level until construction has been completed to such an extent that the structure, pipeline or fill will not be floated or otherwise damaged. It is further expected that the type of system, spacing of dewatering units and other details of the Work will have to be varied depending on soil/water conditions at a particular location.

M. Submit to the Engineer for review, a proposed initial plan for removal of water, method of excavation and support of the excavation. Do not proceed with construction in any of these areas until the initial plan has been reviewed and accepted by the Engineer. It is expected that the initial plan may have to be modified to suit the variable soil/water conditions to be encountered. Dewater and excavate, at all times, in a manner that does not cause loss of ground or disturbance to the pipe or appurtenance bearing soil or soil which supports overlying or adjacent structures.

N. If the method of dewatering does not properly dewater the trench as specified, installation of groundwater observation wells may be required as directed by the Owner. Do not place any pipe or structure until the readings obtained from the observation wells indicate that the groundwater has been lowered a minimum of 6 inches below the bottom of the final excavation within the trench limits.

O. Dewatering Wells and Piping

1. Dewatering units used in the Work shall be surrounded by suitable filter sand and no fines shall be removed by pumping. Pumping from the dewatering system shall be continuous until water is allowed over the work in accordance with this Section. Stand-by pumps shall be provided.

2. Adequate dewatering wells, piping, and appurtenances shall be installed, and operational as required in this Section for anticipated construction prior to setup of pipe installation traffic controls shown on the Drawings.

3. Where dewatering wells, piping, or appurtenances are installed within the traveled way, all piping, wiring, and appurtenances shall be completely buried and repaved flush to adjacent finished ground. Following installation of dewatering wells, piping, or appurtenances, traffic shall be returned to normal.

P. Water entering the excavation from precipitation or surface runoff shall be collected and discharged in a lawful and approved manner.

Q. Handling and Discharge of Water Derived from Dewatering:

1. No Regional Board dewatering permit has been obtained for the Work; therefore, no water removed from excavations shall be discharged from the Site. Water from trench or excavation dewatering may be used for dust control or irrigation at the Site or at another location for which the Contractor has written approval from the property owner for such activity.

2. Handling and beneficial use of water or lawful disposal of water derived from dewatering shall be the responsibility of the Contractor.

3. The Contractor shall acquire necessary permits from all governing agencies and any required temporary easements for the reuse of water if necessary. The Contractor shall perform any excavation, paving and traffic control necessary to install and remove facilities for the transportation and reuse of water.

R. Dewatering Well Abandonment

1. Upon completion of work that requires the use of a dewatering well, the Contractor shall abandon the well in accordance with the requirements of local agency having jurisdiction. Such requirements shall be determined and agreed with the agency having jurisdiction prior to the installation of any dewatering wells.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 02150

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials and equipment required and perform all site and right-of-way clearing and grubbing, complete as specified in the Contract Documents.

B. Obtain all permits required for site preparation work prior to proceeding with the Work, including clearing and tree removal.

C. The areas to be cleared, grubbed and stripped shall be minimized to the extent possible for the scope of work and in consideration of the actual means and methods of construction used. No unnecessary site preparation within these areas shall be performed.

1.02 RELATED WORK

A. Earthwork is included in Section 02200.

B. Environmental Protection is included in Section 02960.

C. Miscellaneous Work and Cleanup are included in Section 02990.

1.03 SUBMITTALS

A. In accordance with Section 01300, submit to the Engineer copies of all permits required prior to clearing, grubbing, and stripping work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CLEARING

A. Where the removal of trees, shrubs or any vegetation is indicated or specified to be removed, in whole or in part, the Contractor shall accomplish such removal and subsequent disposal at his sole expense under the Contract and no extra payment will be

made therefor. Where roots of trees are severed sufficiently, in the opinion of the Owner, to create a hazardous condition, such trees shall be removed and disposed of by the Contractor at no additional cost to the Owner. Cut and remove all trees, stumps, brush, shrubs, roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground.

B. Within trench limits and footprints of facilities to be constructed, all vegetation, including trees and shrubs, shall be removed; however, the extension of limits beyond that specified or indicated, owing to the Contractor's error, or for reasons of his convenience, or for any other reason, shall not be just cause for removal or damage to any trees, shrubs, etc.

C. The Contractor shall protect all trees, shrubs, and other vegetation except as indicated or specified otherwise. Preserve and protect trees and other vegetation directed by the Owner to remain as specified below.

D. The Contractor shall be liable for all damages and costs on account of any unauthorized removal of trees and other vegetation in connection with his operations and for damage to any such vegetation left standing, except for such cutting of roots as is absolutely necessary in order to complete the work in accordance with these specifications.

E. Agricultural windrow trees shall not be damaged or removed unless shown on the Drawings. All windrows shall be protected in place and pruned in accordance with Paragraph 3.05.C only when necessary for construction.

F. Preserve and protect irrigation systems encountered in construction of the Work. Promptly reconstruct and restore to service irrigation systems removed or damaged in the performance of the work. Irrigation systems temporarily disconnected or removed shall have their service areas watered by hand or other means to maintain the vegetation in a state the same as existing prior to construction until service is restored.

3.02 GRUBBING

A. Grub and remove all stumps, roots in excess of 1-1/2 inches in diameter, matted roots, brush, timber, logs, concrete rubble and other debris encountered to a depth of 18 inches below original grade or 18 inches beneath the bottom of foundations, whichever is deeper.

B. Refill all grubbing holes and depressions excavated below the original ground surface with suitable materials and compact to a density conforming to the surrounding ground surface in accordance with Section 02200.

3.03 STRIPPING

A. Strip topsoil from all areas to be occupied by structures and roadways and all areas to be excavated or filled.

B. Topsoil shall be free from brush, trash, large stones and other extraneous material. Avoid mixing topsoil with subsoil.

C. Stockpile and protect topsoil until it is used in right-of-way restoration operations. Dispose of surplus topsoil after all work is completed in accordance with applicable regulations.

3.04 DISPOSAL

A. Dispose of material and debris from site preparation operations by hauling such materials and debris to an approved offsite disposal area. No rubbish or debris of any kind shall be buried on the Site.

B. Burning of cleared and grubbed materials or other fires for any reason will not be permitted.

C. All waste and surplus excavated materials become the property of the Contractor and must be disposed of off-site in a lawful manner. The Owner reserves the right, at his discretion, to take ownership and possession of samples of excavated materials.

3.05 PROTECTION

A. Trees and other vegetation designated on the Drawings or directed by the Owner to remain shall be protected from damage by all construction operations by erecting suitable barriers, guards and enclosures, or by other approved means. Conduct clearing operations in a manner to prevent damage to trees and vegetation designated to remain and to the Work being constructed and to provide for the safety of employees and others.

B. All vegetation outside the work area limits, including trees and shrubs, shall be protected in place unless removal or modification of such is allowed in writing by both the Owner and the agency having jurisdiction or the property owner.

C. Pruning: Trees not removed shall be protected in place. Tree branches interfering with construction operations shall be neatly cut off to the boles in a workmanlike manner, as necessary. The Contractor shall remove additional tree branches under the direction of the Owner or agency having jurisdiction in such a manner that the tree will present a balanced appearance. Cuts over 1 inch in diameter shall be immediately treated with an acceptable tree wound paint. Tree roots within the dripline of a tree which must be cut shall be evaluated by a licensed arborist prior to cutting to determine method of cutting, amount of allowed, and any other protective measures to ensure survivability of tree. The arborist shall be provided by the Contractor at no additional cost to the Owner.

D. Maintain protection of trees and other vegetation until all work in the vicinity of the trees and other vegetation being protected has been completed.

E. Do not operate heavy equipment or stockpile materials within the branch spread of existing trees.

F. Immediately repair any damage to existing tree crowns, trunks, or root systems. Roots exposed and/or damaged during the Work shall immediately be cut off cleanly inside the exposed or damaged area. Treat cut surfaces with an acceptable tree wound paint and topsoil spread over the exposed root area.

G. When work is completed, remove all dead and downed trees. Live trees shall be trimmed of all dead and diseased limbs and branches. All cuts shall be cleanly made at their juncture with the trunk or preceding branch without injury to the trunk or remaining branches. Cuts over 1 inch in diameter shall be treated with an acceptable tree wound paint.

H. Restrict construction activities to those areas within public rights of way, temporary and permanent easements, and as specifically shown on the Drawings. Adjacent properties and improvements thereon, public or private, that become damaged by construction operations, shall be promptly restored to their original condition, to the full satisfaction of the property owner at no additional cost to the Owner.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. It shall be the responsibility of the Contractor to allow for, excavate, segregate, and place in acceptable locations any unsuitable material encountered. The Contractor shall replace any unsuitable material with suitable compacted select fill per the Contract Documents. All unsuitable material removal, relocation, and/or disposal for construction purposes shall be the responsibility of the Contractor and shall be paid in accordance with the appropriate bid items.

B. The Contractor shall furnish all labor, materials, equipment and incidentals required, and perform all excavation work and grading; place and compact backfill and fill; and dispose of waste and surplus materials as specified in the Contract Documents.

C. The Contractor shall provide the services of a licensed land surveyor registered in the State of California to provide all required survey adequate to properly construct all facilities.

D. The Contractor shall furnish and install all imported granular material and select granular materials required to finish earthwork at no additional cost to the Owner.

E. Wherever the requirement for a specified percent compaction of soil material is referred to herein or on Drawings, it shall mean "at least the specified percent of maximum density as determined by ASTM D1557."

1.02 RELATED WORK

A. Dewatering and Drainage are included in Section 02140.

B. Clearing and Grubbing are included in Section 02150.

C. Trenching, Backfilling and Compaction are included in Section 02220.

D. Granular and Rock Materials are included in Section 02230.

E. Sheeting, Shoring, and Bracing are included in Section 02400.

F. Asphalt Concrete Pavement and Base are included in Section 02512.

G. Environmental Protection is included in Section 02960.

H. Miscellaneous Work and Cleanup are included in Section 02990.

I. Concrete Work is included in Section 03300.

1.03 SUBMITTALS

A. Submit to the Engineer in conformance with Section 01300:

1. Test reports of imported material. Samples shall be submitted in accordance with SSPWC, Subsection 306-1.3.7.

2. Such other samples of materials as the Engineer may require.

3. The proposed methods of construction, including excavation, excavation support systems designs, backfilling, filling and compaction, for the various portions of the Work.

4. Utility Potholing Report.

B. Submit to the Engineer prior to the start of any excavation work:

1. Copy of the excavation permit issued by the California Department of Industrial Relations.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

1.05 QUALITY ASSURANCE

A. Prior to and during the placement of backfill and fill of materials other than cement-sand slurry or concrete, coordinate with the Owner or Owner's Materials Inspector to perform in-place soil density tests or to verify that the backfill/fill material has been compacted in accordance with the compaction requirements specified elsewhere. The Owner, Engineer, or Owner's Materials Inspector may designate areas to be tested.

B. From time to time and at such time as deemed necessary during backfill operations, the Owner may make or cause to be made, tests of the backfill material to determine whether such compaction and/or compressive strength meets the minimum requirements specified for the various portions of the Work.

C. The Owner will bear all costs for initial compaction and material testing at the selected locations; however, in areas where results of initial testing indicate the need for additional compaction, removal and recompaction or removal and replacement, of backfill material, the Contractor shall bear the costs of retesting.

D. In every case, the quantity and location of specific points at which tests are to be made shall be selected by the Owner. The Contractor shall cooperate with and assist the Owner, as necessary, to perform the soils tests or taking of samples. When selected points for testing occur below the backfill surface, the Contractor shall excavate all materials in the area to such point and shall replace same following completion of testing. All cost of such excavations and replacements shall be borne by the Contractor as a part of his obligation under the Contract.

E. The Contractor shall remove material as required in any areas where compaction and/or compressive strength of the material when tested do not fully comply with these Specifications. The unsatisfactory material shall be promptly removed after notification and replaced with material that conforms to the specified requirements. Any additional costs for such required removal and recompaction or replacement of material shall be borne by the Contractor.

1.06 DEFINITIONS

A. Where the phrase "in-the-dry" is used in this Section, it shall be defined to mean a soil condition such that the groundwater has been dewatered to a level 6 inches below the bottom of excavation and the water allowed to drain from the soil. If the bottom of excavation appears questionable as determined by the Owner, the Contractor shall excavate a pothole in the bottom of the excavation to determine the actual groundwater elevation at no additional cost to the Owner.

B. Where used in this Section, "structures" refers to all buildings, wet wells, manholes, reservoirs and below-grade vaults. Stormwater structures smaller than 27 cubic feet in volume and duct banks are not considered structures in this context.

C. Where used in this Section, "structural backfill" or "structural base material fill" refers to materials placed for, under or against buried structures as defined in Section 02230.

D. Where used in this Section, "compressive strength" in relation to backfill material, it refers to the tested compressive strength of cementitious backfill materials such as cement-sand slurry.

PART 2 - PRODUCTS

2.01 GENERAL

A. Materials designated for use in this Section are specified in Section 02230, excepting that materials to be used for trench construction are specified in Section 02220.

B. Timber used for excavation support systems shall be pressure treated with wood preservative for ground contact.

PART 3 - EXECUTION

3.01 PREPARATION

A. The Contractor shall perform investigations, including exploratory excavations, to determine and confirm the location and type of existing utilities, service laterals and appurtenances. The Contractor shall perform such investigations sufficiently in advance of the submittal of Shop Drawings. If the Contractor discovers utility facilities not identified on the Drawings or in a position different from that shown in the Contract Documents, the Contractor shall immediately notify the Owner in writing.

B. Exploratory Excavations

1. Perform exploratory excavation work (pothole) for the purpose of verifying the location of underground utilities and structures prior to commencing excavation work.

2. Record location and elevation of existing utilities investigations on project record drawing as well as including such information in the Pothole Report.

3. Pothole excavations shall be backfilled as soon as the desired information has been obtained. Backfilled surfaces shall be stabilized in accordance with encroachment permit requirements and these Specifications, as applicable.

4. Unless required otherwise by the agency having jurisdiction, pothole excavations shall be backfilled with 1-1/2 sack cement-sand slurry. Surface treatment shall be A.C. pavement in accordance with Section 02512 for A.C. paved areas and concrete in accordance with the agency having jurisdiction for concrete areas. Within unpaved areas, pothole excavations shall be backfilled with excavated material compacted to 90% or as required by the agency having jurisdiction.

C. Any necessary temporary dewatering and drainage systems shall be in place and operational prior to beginning excavation work in accordance with Section 02140.

3.02 STRUCTURAL EXCAVATION PROCEDURES

A. Excavations for structures shall be suitably wide for construction of the structures, including excavation supports, dewatering and drainage systems and working clearances.

B. Excavation for structures shall be carried to lines and grades required to properly accommodate construction of such structures to the dimensions shown on the Drawings or as directed.

C. All excavation along the slope required for the pipeline construction including supports and discharge structure, shall be performed by hand. The use of heavy machinery shall not be allowed unless the Contractor can demonstrate to the District that such use of heavy machinery will not damage vegetation more than that if performed by hand excavation. Such approval for use of heavy machinery shall be at the sole discretion of the District.

D. Excavation shall be performed in-the-dry and shall be accomplished by methods that preserve the undisturbed state of subgrade soils. Any necessary drainage and dewatering systems shall be in place and operational prior to beginning excavation work. In no case shall the earth be plowed, scraped or excavated by any means so near to the finished subgrade that would disturb the finished subgrade. Hand excavation of the final 3 to 6 inches may be required to obtain a satisfactory, undisturbed subgrade. Subgrade soils that become soft, loose, "quick," or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering, or other construction methods shall be removed and replaced in accordance with Paragraph 3.02.E of this Section at no additional cost to the Owner.

E. Spoils from excavation on slope for pipeline construction shall not be spread or stored on the slope and shall be removed once excavated.

F. When excavations have reached the required subgrade, including any allowances for working mats or base materials, prior to the placement of working mats or base materials, notify the Owner for soils testing. If the material at the level of excavation bottom consists of unsuitable soft earth as determined by the Owner, the subgrade material shall be removed to the extent directed and the excavation refilled as required in Paragraph 3.02.E of this Section.

G. Filling of overexcavated material shall be as follows:

1. Overexcavation required due to inadequate excavation, dewatering, or other construction methods, subject to prior approval by the Owner.

    a. 1 1/2 sack cement-sand slurry.

b. Areas where groundwater is present or known to be present, use crushed rock wrapped in geotextile filter fabric.

c. Areas where groundwater is unlikely or not known to be present, use crushed rock with geotextile filter fabric unless the Owner determines that groundwater is not of concern and the geotextile filter fabric is not required.

2. Overexcavation required due to found unsuitable conditions following proper excavation, subject to approval by the Owner.

a. Areas where groundwater is present or known to be present, use crushed rock wrapped in geotextile filter fabric.

b. Areas where groundwater is unlikely or not known to be present, use crushed rock with geotextile filter fabric unless the Owner determines that groundwater is not of concern and the geotextile filter fabric is not required.

H. Subgrade Preparation:

1. All structures unless otherwise specified in the Contract Documents:

a. Compact the top 12 inches of subgrade to a minimum of 95 percent modified proctor (ASTM D1557).

b. Install 8-inch thick crushed rock wrapped in geotextile filter fabric under and 12 inches beyond all sides.

3.03 GENERAL FILLING AND BACKFILLING PROCEDURES

A. Fill and backfill materials shall be placed in lifts not exceeding 8 inches (measured before compaction) when using non-hand operated equipment for compaction to suit the specified compaction requirements to the lines and grades required, making allowances for settlement and placement of cover materials (e.g., topsoil, sod). Soft spots or uncompacted areas shall be corrected.

B. Compaction in open areas excluding steep sloped areas may be accomplished by any of the following methods: compaction equipment, tracked dozers weighing at least 30,000 lbs. and operated at speeds sufficient to achieve specified compaction, or heavy vibratory rollers. Compaction in confined areas (including within a 45 degree angle extending upward and outward from the base of a wall, but not including steep sloped areas) and in areas where the use of large equipment is impractical, shall be accomplished by use of hand operated vibratory equipment or mechanical tampers. Lift thickness shall not exceed 6 inches (measured before compaction) when hand operated equipment is used.

C. Compaction in steep sloped areas (2 horizontal to 1 vertical or steeper) or along slopes where vegetation will be damaged/destroyed by the use of heavy equipment, compaction shall be achieved by use of a large excavator or similar equipment stationed on the top of the asphalt pad. Boom of the machine shall be of sufficient reach to effectively fill and compact area. Compaction shall be achieved by use of a sheepsfoot attachment, vibratory plate attachment or other such attachment as approved by the District.

D. Fill and backfill shall not be placed and compacted when the materials are too wet to properly compact (i.e., when the in-place moisture content of the soil is more than two percentage points above the optimum moisture content as determined by a laboratory test for the specified level of compaction). Wet soils shall be dried and brought to in-the-dry condition prior to placing fill or backfill. The Contractor may furnish and place imported granular material, at his/her discretion, after approval by the Owner and at no additional cost to the Owner.

3.04 FILL AND BACKFILL PROCEDURES

A. Fill and backfill material placed immediately adjacent to and within 10 feet of all structures shall be select granular material unless otherwise shown on the Drawings. All structure water-tightness tests and waterproofing shall be completed prior to placing fill or backfill around structures. Place and compact select granular material in even lifts of 8 inches (loose thickness) uniformly around the structure.

B. Sub-base fill required beneath building slabs, manholes, and other structures as specified or shown on the Drawings or fill under slabs on grade (except sidewalks) shall be structural base material fill. Place and compact structural base material fill in even lifts of 8 inches (loose thickness).

C. Within agricultural areas, soils from access roads shall not be used for fill and shall be completely removed from areas used for agricultural crops or landscaping.

3.05 COMPACTION REQUIREMENTS

A. The minimum requirements for compaction shall be as shown on the Drawings and as shown below, whichever is more stringent.

B. Ten feet around structures: Compact the top 12 inches of existing subgrade and each layer of fill or backfill to a minimum of 95 percent modified proctor (ASTM D1557) at or near its optimum moisture content (0 to 2 percent).

C. Beneath building slabs and slabs on grade (except sidewalks): Compact the top 12 inches or as shown on Drawings of subgrade (and each layer of fill if applicable) to a minimum of 95 percent modified proctor (ASTM D1557) at or near its optimum moisture content (0 to plus 2 percent).

D. Roads, paved areas and roadway shoulders: Backfill with cement-sand slurry as specified in Section 02250 to limits specified in Section 02512 and as additionally required in the Contract Documents.

E. Unpaved areas: Backfill with select granular material as specified in Section 02230, imported granular material, or topsoil, unless otherwise specified, to limits specified in Section 02220.

F. Along the steep sloped areas at the east side of the project site, adequacy of compaction shall be determined by the District. Contractor will not be required to compact greater than 90 percent modified proctor (ASTM D1557) at or near its optimum moisture content (0 to plus 2 percent).

3.06 DISPOSAL OF UNSUITABLE, WASTE AND/OR SURPLUS EXCAVATED MATERIAL

A. All waste and excess excavated materials become the property of the Contractor and must be disposed of off site in a lawful manner. The Owner, at his discretion, reserves the right to take ownership and possession of samples of excavated materials.

B. Materials may be temporarily stockpiled in an area within the limits of construction within public right-of-way by permission of the agency having jurisdiction, provided it does not disrupt construction activities, create any nuisances or safety hazards, cause damage to existing facilities, or otherwise restrict access to the Site of the Work. Materials may not be stockpiled within 10 feet of centerline of existing buried pipelines.

3.07 GRADING

A. Grading shall be performed to the lines and grades shown on the Drawings. All objectionable material encountered within the limits indicated shall be removed and disposed of. Subgrades shall be completely and continuously drained and dewatered throughout the grading process. Install temporary drains, drainage ditches, etc, to intercept or divert surface water that may affect the execution or condition of grading work.

B. If at the time of grading it is not possible to place any material in its proper section of the Work, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

C. In cut areas, all loose or protruding rocks in slopes shall be removed to line or finished grade of the slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings unless otherwise directed by the Owner.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 02220

TRENCHING, BACKFILLING AND COMPACTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material and restoration of trench surfaces and easements.

B. Excavation shall extend to the width and depth specified in the Contract Documents and shall provide suitable room for installing pipe, structures and appurtenances.

C. Excavation shall be as specified in Section 02200 except as modified in this Section.

D. The bottom of the excavation shall be firm, dry and in all respects, acceptable to the Owner prior to placement of bedding material. All excavation except as specifically shown on the Drawings shall be made in open trenches.

E. Wherever the requirement for a specified percent compaction of soil material is referred to herein, it shall mean "at least the specified percent of maximum density as determined by ASTM D1557."

1.02 RELATED WORK

A. Dewatering and Drainage are included in Section 02140.

B. Clearing and Grubbing are included in Section 02150.

C. Earthwork is included in Section 02200.

D. Granular and Rock Materials are included in Section 02230.

E. Cement-Sand Slurry is included in Section 02250.

F. Sheeting, Shoring and Bracing are included in Section 02400.

G. Asphalt Concrete Pavement and Base are included in Section 02512.

H. Miscellaneous Work and Cleanup are included in Section 02990.

I. Concrete Work is included in Section 03300.

1.03 SUBMITTALS

A. Submit the following to the Engineer in accordance with Section 01300:

1. Data for bedding and backfill materials, including sources of materials, gradation, testing data and backfilling and compaction method.

2. Test report(s) for Type II/V Portland Cement showing chemical analysis and physical properties.

3. Prior to the start of work, submit the proposed method of backfilling and compaction to the Engineer for review.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C150 – Standard Specification for Portland Cement

2. ASTM D1557 – Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

1.05 DEFINITIONS

A. Non-Agricultural Unpaved Area – Area that is not paved, does not have agricultural crops of any type, or is not shown on the Drawings as being agricultural. An example of such an area would be the dirt shoulder of a paved roadway or any areas maintained generally clear of vegetation.

B. Agricultural Unpaved Areas – Area within an agricultural area that is cultivated and used for planting of agricultural crops, whether crops are observed or not. Fallow areas shall be treated as an agricultural unpaved area.

C. Grassed or Landscape Area – Area that is unpaved and has intentionally planted landscaping or an area that does not have intentionally planted landscaping, but is designated as a landscape or planting area. Examples would include a grass field or any area in which vegetation is required to be restored.

D. Agricultural Access Road Area – A road within or around an agricultural field that is treated with an herbicide and used for regular or occasional vehicular and pedestrian access.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Crushed rock shall be as specified in Section 02230.

B. Sand shall be as specified in Section 02230.

C. Select granular material shall be as specified in Section 02230.

D. Imported granular material shall be as specified in Section 02230.

E. Geotextile filter fabric shall be a non-woven polypropylene geotextile filter fabric material such as Propex Geotex 601, TenCate Mirafi N-Series 160N, and Thrace-Linq 150EX or an approved equivalent

F. Cement-sand slurry shall be as specified in Section 02250.

G. Topsoil shall be free from rocks or stone fragments larger than 2 inches in their greatest dimension, asphalt, trash, and other objectionable materials. Topsoil shall be stockpiled material excavated from the same area and depth to be replaced or may also be imported from a licensed nursery.

2.02 TRENCH SECTION MATERIALS

A. General: Contractor shall use the trench section as shown on the Drawings.

B. Bedding Zone I Materials: Bedding Zone I material shall be placed only as directed by the Owner. Bedding Zone I material shall be uniformly graded crushed rock wrapped in geotextile material. Thickness of crushed rock layer shall be 8 inches unless otherwise shown on the Drawings or as indicated in Paragraph 3.03 of this Section.

C. Bedding Zone II Materials: Bedding Zone II materials shall be sand. Minimum thickness of sand layer below pipe bottom shall be 6 inches, unless otherwise shown on Drawings.

D. Pipe zone materials shall be sand. Minimum thickness of sand layer above pipe shall be 12 inches, unless otherwise shown on the Drawings.

E. Trench Backfill Zone Materials – Paved Areas: Trench backfill zone material shall be cement-sand slurry and asphalt concrete or concrete pavement to match existing pavement material.

F. Trench Backfill Zone Materials – Non-Agricultural Unpaved Areas: Trench backfill zone material shall be select granular material or topsoil as appropriate to finished grade.

G. Trench Backfill Zone Materials – Grassed or Landscaped Areas: Trench backfill zone material shall be select granular material. Select or imported granular material shall be extended up to 2.5 feet below the existing ground surface. Remaining backfill to finished grade shall be topsoil.

H. Trench Backfill Zone Materials – Agricultural Unpaved Areas: Trench backfill zone material shall be select granular material. Select or imported granular material shall be extended up to 2.5 feet below the existing ground surface. Remaining backfill to finished grade shall be topsoil.

I. Trench Backfill Zone Materials – Agricultural Access Road Areas: Trench backfill zone material shall be select or imported granular material. Select or imported granular material shall be extended up to finished grade.

PART 3 - EXECUTION

3.01 TRENCH EXCAVATION

A. Trench excavation shall include excavating material of every description and of whatever substance encountered. Asphalt and concrete pavement, if existing, shall be cut with a saw, wheel or pneumatic chisel along straight lines before excavating.

B. Strip and stockpile the top 2.5 feet of topsoil from grassed, landscaped, agricultural or unfinished ground areas, excepting unpaved access roads, crossed by trenches. Topsoil may only be otherwise disposed of and replaced, when required, with approved topsoil of equal quality with advanced written approval by the Owner.

C. While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected.

D. Trenches shall be excavated to the depth indicated in the Contract Documents and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Owner. Trench width shall be within the limits indicated.

E. Dewatering shall be performed such that the water table shall be maintained to at least 6 inches below the bottom of the trench at all times during construction and in accordance with Section 02140. Water shall not be allowed to rise into the trench at any time.

F. Clay and organic silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use care during the excavation of the last 1 foot of depth.

G. Where the trench bottom is to be crushed rock or sand bedding, the trench may be excavated by machinery to the required depth provided the material remaining in the bottom of the trench is no more than slightly disturbed.

H. Setting up of temporary traffic controls for trench excavation shall not begin until all installation materials required to complete the trenching and material installation work associated with that traffic control set up has been delivered to the field or is at the Contractor's yard. This includes, but is not limited to, pipe, pipe fittings, pipe couplings, pipe coatings, pipe linings, precast concrete structures, etc. Bulk materials such as granular material, concrete, sand, etc. shall have accepted submittals and be confirmed available for the time when the Contractor will need such materials. Work for installation of dewatering wells required prior to trench excavation shall be performed prior to installation of temporary traffic controls for trench excavation and in accordance with Section 02140, Paragraph 3.03.O.

3.02 STORAGE AND DISPOSAL OF MATERIALS

A. Excavated material shall be stockpiled without excessive surcharge on the trench bank, shoring and existing underground and above ground facilities. It shall also not be stockpiled on any existing improved landscaping.

B. Excavated material shall be stockpiled without obstructing free access to hydrants and associated valves.

C. Should conditions make it impracticable or unsafe to stockpile material adjacent to the trench, the material shall be hauled and stored at a location to be approved by the Owner. When required, it shall be re-handled and used in backfilling the trench. Double handling of such material shall be performed at no additional cost to the Owner.

D. Excavated material, if to be reused as backfill material or a component of the backfill, shall be segregated as required by these Contract Documents. Topsoil, where required to be replaced, shall be stockpiled separately from other excavated materials and shall not be allowed to be mixed with other excavated materials.

E. All waste and excess excavated materials become the property of the Contractor and must be disposed of off-site in a lawful manner. The Owner, at his discretion, reserves the right to take ownership and possession of samples of excavated materials.

3.03 EXCAVATION BELOW GRADE AND REFILL

A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.

B. If the Contractor excavates below the design subgrade through error or for the Contractor's own convenience, he may be directed by the Owner to provide additional dewatering below the new subgrade and refill the overexcavated area in accordance

with Section 02200, Paragraph 3.02.E.1 to the elevation of the design subgrade, in which case the work of dewatering and excavating below grade and furnishing and placing the refill shall be performed at the Contractor's expense.

C. If the Contractor fails to properly dewater the trench or disturbs the subgrade before dewatering is sufficiently complete, Contractor may be directed by the Owner to properly dewater the area, excavate below the design subgrade and refill the overexcavated area in accordance with Section 02200, Paragraph 3.02.E.1 to the elevation of the design subgrade at the Contractor's expense.

D. If the material at the level of trench bottom consists of unsuitable soft earth as determined by the Owner, the subgrade material shall be removed to the extent directed and Bedding Zone I extended in accordance with Section 02200, Paragraph 3.02.E.2.

3.04 BACKFILLING

A. Pipe Trench

1. If required by Owner, crushed rock placed within Bedding Zone I shall be placed and compacted in a manner that it provides a hard, firm, unyielding and stable surface. Crushed rock shall be placed in lifts not exceeding 8 inches in thickness. Each lift of crushed rock shall be compacted by at least two (2) passes of a flat plate vibratory compactor, vibrating plate attached to a backhoe, or similar approved equipment. All crushed rock at any depth shall be wrapped together in geotextile material to prevent migration of fines into the trench area.

2. Crushed rock shall be fully encased together in geotextile filter fabric. Geotextile filter fabric shall have a minimum of 12-inch overlaps at all edges.

3. Sand up to bottom of pipe shall be placed and compacted to 95 percent relative compaction, relative to the ASTM D1557 laboratory maximum density. The bedding layer shall be true to line and grade and shall be compacted by at least two (2) passes of a flat plate vibratory compactor, vibrating plate attached to a backhoe, or similar approved equipment.

4. As soon as practicable after the pipe has been laid, jointed and inspected by the Owner, backfilling of remaining bedding zone and pipe zone materials shall begin.

5. The placement of remaining sand within bedding zone and pipe zone up to 12 inches above the pipe shall be in even layers not to exceed 8 inches on each side of the pipe, with the difference in level on either side of the pipe not exceeding 4 inches. Compaction of materials to 95 percent relative compaction shall be by tamping or vibrating with at least two (2) passes of mechanical compaction equipment and shall be approved by the Owner.

6. Compaction above the springline shall be done in lifts equal to or slightly above the zone of influence for the compaction machine used, but shall not exceed the thickness specified in paragraph 3.04.A.5 of this Section. Compaction equipment with a zone of influence greater than the maximum allowed lift shall not be used. Care shall be taken to avoid performing any compaction that will directly affect the pipe surface.

7. Select granular backfill in unpaved areas shall be placed in layers not to exceed 8 inches compacted to 95 percent relative compaction, relative to the ASTM D1557 laboratory maximum density.

8. Topsoil material in unpaved agricultural, grassed or landscaped areas shall be placed in layers not to exceed 8 inches compacted to 80 percent relative compaction, relative to the ASTM D1557 laboratory maximum density or less as required by the property owner or agency having jurisdiction.

B. The Contractor shall exercise care in the placement and compaction of backfill. It shall be the Contractor's responsibility to repair or replace pipe broken or damaged by the Contractor's action at no extra cost of the Owner.

C. The Contractor shall take necessary measures to avoid floating or movement of the pipe and structures during backfilling and compaction operations.

D. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted.

E. Water jetting or puddling is not permitted.

F. Backfill shall be brought up evenly within the trench and evenly on each side of the pipe as specified for each zone. Each layer of backfill material shall be thoroughly compacted by rolling, tamping, or vibrating, as applicable, with mechanical compacting equipment carefully selected to prevent damage to the pipeline, structures and appurtenances. If rolling is employed, it shall be by use of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench.

G. The in-place density of the backfill materials, such as sand or local soil, may be tested by the Owner's Materials Inspector using either a nuclear gauge (D2922), modified sand cone test (ASTM D1556), water balloon test (ASTM D2167), or other such methods as appropriate for the type of backfill material being tested. Additional testing may be required by the agency having jurisdiction, and it shall be the responsibility of the Contractor to provide or cause to be provided all required testing to the satisfaction of the agency having jurisdiction.

H. Backfill around structures, including manholes, within paved areas shall be cement-sand slurry as specified in Section 02250. Within unpaved agricultural (non-access road), grassed, or landscaped areas, backfill shall be structural backfill as specified in

Section 02230, Paragraph 2.01.F with the top 2.5 feet being topsoil. Topsoil may also be imported from a licensed nursery. Topsoil shall be free from rocks or stone fragments larger than 2 inches in their greatest dimension, asphalt, trash, and other objectionable materials. Soil excavated from along uncultivated access roads shall not be used as topsoil within active or inactive cultivated areas. All other unpaved areas shall be backfilled with structural backfill to the existing surface.

I. At the discretion of the Owner, the in-place density testing of crushed rock lower bedding or backfill may be performed in the trench or on a test pad constructed by the Contractor using equipment and methods similar to those used to compact the crushed rock in the trench. The Contractor shall furnish all labor, tools, equipment, materials and incidentals required to prepare the trench location(s) or test pad(s) for compaction testing by the Owner and shall be appropriate to the progress of the Work and satisfactory compaction results achieved.

3.05 RESTORING TRENCH SURFACE

A. Where the trench occurs outside of paved streets, in shoulders or sidewalks, or in cross-country areas, thoroughly consolidate the backfill and maintain the surface as the Work progresses.

B. The surface of any driveway, sidewalk, or any other area which is disturbed by the trench excavation or shoring installation or removal and which is not a part of the paved road shall be restored to a condition at least equal to that existing before work began.

C. In sections where the pipeline passes through grassed areas which are not landscaped, otherwise do not show evidence of landscape improvement, or as indicated on the Drawings, remove and replace with a native hydroseed or sod approved by the Owner. The cost of hydroseeding shall be included in the various items of Work and no further compensation will be allowed.

D. In sections where the pipeline passes through areas which are landscaped, show evidence of having been landscaped, or as indicated on the Drawings, remove and replace in kind or as indicated on the Drawings and as approved by the Owner. The cost of replanting vegetation shall be included in the various items of Work and no further compensation will be allowed.

E. Top of restored agricultural access roads shall be treated with an herbicide approved by the property owner.

F. Other surfaces which the pipeline may pass through such as concrete pavement, concrete swales or gutters, pavers, etc. the surface shall be restored to a condition equal to or better than existing and to the satisfaction of the agency having jurisdiction.

G. Restoration of asphalt pavement shall be performed in accordance with Section 02512 and requirements of the agency having jurisdiction, including requirements of applicable encroachment permit(s).

H. Placement of asphalt paving over cement-sand slurry may be performed as soon as the surface will withstand the paving process without displacement or disruption.

I. Where allowed and within any area where public vehicles may access, trench plates shall be non-skid treated. Temporary asphalt shall be used to transition from top of plates to finished surface. The transition shall be even and smooth and shall not cause discomfort to motorists in the opinion of the Owner and agency having jurisdiction.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 02230

GRANULAR AND ROCK MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Granular fill materials are specified in this Section, but their uses for bedding pipe, replacement of unsuitable material, pavement base, foundation support and similar uses are specified in detail elsewhere. The Owner may order the use of fill materials for purposes other than those specified in other Sections if, in the Owner's opinion, such use is advisable.

1.02 RELATED WORK

A. Dewatering and Drainage are included in Section 02140.

B. Earthwork is included in Section 02200.

C. Trenching, Backfilling and Compaction are included in Section 02220.

D. Cement-Sand Slurry is included in Section 02250.

E. Asphalt Concrete Pavement and Base are included in Section 02512.

1.03 SUBMITTALS

A. Submit to the Engineer in conformance with Section 01300:

1. Test reports for granular materials, gradation and quality. Submit for each material to be incorporated into the work.

2. Samples of granular materials in accordance with Standard Specifications for Public Works Construction (SSPWC), Subsection 306-1.3.7.

1.04 REFERENCE STANDARDS

A. California Test 217 (Caltrans) – Method of Test for Sand Equivalent

B. State of California Standard Specifications for Construction of Local Streets and Roads

C. Standards Specifications for Public Works Construction (SSPWC)

PART 2 - PRODUCTS

2.01 MATERIALS

A. Crushed rock shall be uniformly graded, 3/4 inch maximum, and the product of crushing rock or gravel and shall fulfill the requirements and gradation of SSPWC Section 200-1.2.

The material shall compact to a hard, firm, unyielding surface and shall remain stable when saturated with water.

B. Sand used for the Bedding Zone II and in the Pipe Zone shall consist of natural or manufactured granular materials free from frost, frozen lumps, organic material, mica, loam, clay and other deleterious substances, having an expansion when saturated with water of not more than 0.5 of one percent and a gradation conforming to the following requirements:

Sieve	Percent Passing
No. 4	90-100
No. 200	0-12

Sand shall have a sand equivalency greater than 40 as determined by the California 217 test method.

C. Blown sand for filling annular space between carrier pipe and casing shall be as described in Paragraph 2.01.B of this Section and additionally shall be free of lumps when loaded into the hopper and be adequate to flow unobstructed to fill all voids.

D. Structural base material fill shall be crushed aggregate base, free of organic material, loam, wood, trash, snow, ice, frozen soil and other objectionable material and shall be Caltrans Class 2 materials, per Section 02512.

E. Select granular material shall be substantially free of clay, organic material, loam, wood, trash and other objectionable material which may be compressible or which cannot be compacted properly. This material shall not contain stones larger than 4 inches in largest dimension, broken concrete, masonry, rubble, asphalt pavement or other similar materials and have a sand equivalent of not less than 30 as determined by the California 217 test method. Prior to use, select granular material shall be approved by the Owner's Materials Inspector. Material may be imported or from on-site.

F. Structural backfill shall be select granular material (imported or on-site) or cement-sand slurry.

G. Select fill shall be select granular material (imported or on-site).

H. Imported granular material shall be select granular material excepting that it shall be imported to the Site.

I. Aggregate base material shall be in accordance with State of California Standard Specifications for Construction of Local Streets and Roads and Section 02512.

J. Common fill shall be on-site granular material, substantially free of clay, organic material, loam, wood, trash and other objectionable material which may be compressible or which cannot be compacted properly. This material shall not contain stones larger than 4 inches in largest dimension, broken concrete, masonry, rubble, asphalt pavement or other similar materials. Prior to use, common fill material shall be approved by the Owner's Materials Inspector.

K. Topsoil shall be on-site or imported material. On-site topsoil shall be the uppermost 2.5 feet of soil found on-site in existing unpaved grassed, landscaped, or cultivated (active or inactive) areas and shall be free from rocks or stone fragments larger than 2 inches in their greatest dimension, concrete, asphalt concrete, trash, large roots, stumps, branches, or other such debris. Soil excavated from along uncultivated access roads within an agricultural area shall not be used as topsoil. Topsoil removed from a grassed or landscaped area shall not be used as backfill within agricultural areas. Imported topsoil material shall be topsoil obtained from a licensed nursery and as approved in writing by the Owner.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 02250

CEMENT-SAND SLURRY

PART 1 - GENERAL

1.01 DESCRIPTION

A. Cement-sand slurry materials and their mixing, placing, compacting and curing requirements are specified in this Section. Their use for excavation backfill, foundation support, and similar uses are specified in detail elsewhere in the Contract Documents.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install cement-sand slurry as shown on the Drawings, required by the encroachment permit(s) and as specified herein.

1.03 RELATED WORK

A. Dewatering and Drainage are included in Section 02140.

B. Earthwork is included in Section 02200.

C. Asphalt Concrete Pavement and Base are included in Section 02512.

1.04 SUBMITTALS

A. Submit to the Engineer in conformance with Section 01300:

1. Test reports of all types of cement to be used showing chemical analysis and physical properties.

2. Test reports for sand including sieve analysis, physical properties, sand equivalency and deleterious substance.

3. Mix design from the cement-sand slurry producer.

B. Submit to the Owner at time of cement-sand delivery, the mix design ticket from the cement-sand slurry manufacturer. Mix design ticket must match the same mix design approved for use by the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement:

1. Unless otherwise specified, Type II/V Portland Cement conforming to ASTM C150 shall be used.

2. Unless otherwise specified, the minimum content of cement per cubic yard of cement-sand mix shall be as follows:

   a. Trench backfill – 141 lbs (one and a half sack cement-sand slurry)
   b. Void around concrete structures – 188 lbs (two sack cement-sand slurry)
   c. Other applications – 188 lbs (two sack cement-sand slurry)

B. Water: Water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.

C. Sand shall consist of natural or manufactured granular materials free from frost, frozen lumps, organic material, mica, loam, clay and other deleterious substances. Sand shall conform to requirements of SSPWC Section 200-1.5.3, except as noted below. Sand shall have a minimum sand equivalent of 30, the percent passing No. 200 sieve shall not exceed 12 percent and the fines shall be non-plastic.

D. No admixtures or fly ash shall be used unless otherwise approved by the Engineer.

PART 3 - EXECUTION

3.01 MIXING

A. Mixing shall conform to the requirements of SSPWC Section 201-1.4, except as noted below.

B. The total elapsed time between addition of water at the batch plant and discharging the complete mix shall not exceed 120 minutes.

C. Cement, sand and water shall be mixed thoroughly by a machine. Hand mixing will not be allowed.

D. Unless otherwise specified, minimum content of cement shall be as per Paragraph 2.01.A.2.

E. Compressive strength of one and a half sack cement-sand slurry shall be no less than 175 psi and compressive strength of two sack cement-sand slurry shall be no less than 200 psi.

3.02 PLACEMENT

A. Cement-sand slurry may be placed by chutes, conveyors, buckets, pumps or tremies depending upon the application and accessibility.

B. Contractor shall take necessary measures as approved by the Owner to prevent flotation or displacement of pipe and embedded items. Placing temporary sandbags, straps anchored to soil, lower slump cement-sand slurry or permanent concrete cap as approved by the Owner and recommended by the manufacturer of the item to be protected shall be used.

3.03 PLACEMENT OF PAVEMENT

A. Placement of asphalt paving over cement-sand slurry backfill may be performed as soon as the surface will withstand the paving process without displacement or disruption.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 02400

SHEETING, SHORING AND BRACING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Provide protective installation consisting of sheeting, shoring, bracing, piling, wales, anchorages and fastenings, or equivalent system for protection of workers and the Work.

B. This Section is intended to be general in scope and is applicable to all work of this Contract, including principally the following items as may be required in the performance of the Work:

1. Sheeting, shoring and bracing for trenches.

2. Sheeting, shoring and bracing for structural excavations.

C. Federal, state and local requirements for safety of public, workers, and property shall apply to work under this Section.

1.02 STATUTORY REQUIREMENTS

A. The work of this Section shall comply with current versions, with revisions, of the Construction Safety Orders, Division of Industrial Safety, State of California.

B. The Contractor shall comply with the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The Contractor, prior to beginning any trench or structure excavation 5 feet deep or greater, shall submit to the Engineer and shall be in possession of the Engineer's written acceptance for record of the Contractor's detailed plan showing design of all shoring, bracing, sloping of the sides of all excavations, or other provisions for worker protection against the hazard of caving ground during the excavation of such trenches or structure excavation. If such plan varies from the shoring system established in the Construction Safety Orders of the State of California, such alternative system plans shall be prepared, signed, and stamped by a Civil Engineer licensed in the State of California.

C. The Contractor shall obtain a permit from the Department of Industrial Relations, Division of Occupational Safety and Health (CAL-OSHA) when excavations exceed 5'-0". Contact CAL-OSHA at (818) 901-5403 for further information (Health and Safety Code 17922.5).

1.03 RELATED WORK

A. Dewatering and Drainage are included in Section 02140.

B. Earthwork is included in Section 02200.

C. Trenching, Backfilling and Compaction are included in Section 02220.

D. Cement-Sand Slurry is included in Section 02250.

1.04 QUALITY ASSURANCE

A. Conform to the requirements of California Code of Regulations, Title 8, Division 1, Chapter 4.

B. Conform to the requirements of Section 6705, California Labor Code, Shoring and Bracing Drawings.

1.05 SUBMITTALS

A. Prior to commencing work involving sheeting, shoring and bracing, the Contractor shall submit to the Engineer and have the Engineer's written acceptance for record, in accordance with Section 01300 and herein specified design drawings and supporting data as accepted by the CAL/OSHA. Submittals for sheeting, shoring, bracing shall be submitted for record purposes only. Contractor shall remain responsible for adequacy and safety of construction means, methods, and techniques.

1. The Contractor shall employ a California registered Civil Engineer to prepare, stamp seal, and sign design drawings and supporting data including calculations and specifications for the trench and excavation sheeting, shoring and bracing or equivalent systems including all components to be used for the performance of the Work.

2. Contractor and the engineer employed by him shall submit design drawings and supporting data to CAL/OSHA pursuant to the California Code of Regulations, Title 8, Chapter 3.2, Article 2, Section 341 for review and shall make such additions and modifications as are required for Division acceptance.

B. Prior to commencing work, submit certificates of all certified "Competent Persons" who will have the responsibilities described in Paragraph 3.01.J.

C. Prior to delivery of any mainline pipe to the Site or the Contractor's storage yard, submit general procedure of sheeting, shoring and bracing installation and removal which demonstrates the use of non-vibratory, non-impact equipment as described in Paragraph 3.01.D of this Section.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use new or used materials complying with provisions of the approved sheeting, shoring and bracing design drawings. Materials shall be free from defects and damage that might impair in any way their protective function. Wood materials shall be pressure treated and be suitable for the application.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Furnish, install, monitor and maintain excavation support (e.g., shoring, sheeting, bracing, trench boxes) as required by federal, state or local laws, ordinances, regulations and safety requirements and as required to perform the Work within excavation limits indicated. Support the sides of excavation, to prevent any movement that could in any way reduce the width of the excavation below that necessary for proper construction and protect adjacent structures and pavement from undermining, settlement or other damage.

B. Take care to prevent the formation of voids outside of excavation supports. If voids do occur, immediately backfill and compact the voids with cement-sand slurry as approved by the Owner. Voids in locations that cannot be properly compacted upon backfilling shall be filled with lean concrete or cement sand-slurry as approved by the Owner. If any voids form and cause settlement or damage of any kind to the roadway, sidewalks, curbs, gutters, utilities, or any other improvements or structures, the Contractor shall repair such damage to the satisfaction of the Owner and jurisdictional agency or owner of facility, including removal and replacement of damaged improvements if necessary.

C. Prior to the start of excavation or shoring installation, dewatering of the construction area must be completed per Section 02140.

D. Utilize shoring installation and removal methods that will not cause damage to adjacent structures, homes, or businesses. The use of low or high frequency vibration to install or remove shoring or shoring components will not be allowed. High impact driven piles will also not be allowed. Installing shoring using hydraulic, pneumatic, or other impact methods, including impacting with equipment (such as with an excavator) is not permitted.

E. Abut members to exclude groundwater and fines, preventing the erosion of voids outside sheeting. In soft, wet ground, push sheeting to a lower level as excavation progresses so that sheeting is embedded in undisturbed earth. Install supports at close intervals to prevent displacement of the surrounding earth and to maintain safe conditions in the work area. Any damage shall be the responsibility of the Contractor.

F. Install excavation supports outside the neat lines of foundations. Supports shall be plumb and securely braced and tied in position. Excavation support shall be adequate to withstand all pressures to which the supports will be subjected. Any movement or bulging of supports shall be corrected to provide the necessary clearances, dimensions and structural integrity.

G. Withdraw individual members alternately as the backfill is raised, maintaining sufficient sheeting, shoring and bracing to protect the Work, workmen, adjacent structures, vehicular traffic, utilities and/or property. Remove bracing completely. Alternatively, thin-sectioned shoring, such as sheet piles, may be removed following completion of backfill. If shoring is to be removed following backfill, then the Contractor must verify there are no voids behind the shoring that will remain after the shoring is removed.

H. All voids left or caused by withdrawal of supports shall be immediately filled with cement-sand slurry.

I. Excavation Supports Left in Place

1. Only where unstable conditions occur in the underlying strata from any cause and withdrawal of sheeting will endanger the Work, a portion of the sheeting, including bracing, may be left in place as indicated on the Drawings or with written approval of the Owner. Remove all wood within a zone extending four (4) feet below finished grade. The Contractor shall not regularly install a trench shoring system that will leave excavation supports in place.

2. The Owner or Engineer may direct that certain excavation supports remain in place, or be cut off at any specific elevation. Supports directed by the Owner or Engineer to be left in place and not so designated in the Contract Documents to remain in place, will be paid for in accordance with the Contract Documents. If the Contractor believes that such a directive would entitle Contractor to Extra Work, the Contractor shall notify the Owner in accordance with the applicable article(s) in the General Conditions pertaining to changes in the Work.

3. The right of the Owner or Engineer to direct that certain excavation supports remain in place shall not be construed as creating any obligation on the Owner or Engineer to give such direction, nor shall failure to give such direction relieve the Contractor from liability for damages to persons or property occurring from or upon the Work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient excavation supports to prevent any movement of the ground or damage to adjacent structures.

J. The Contractor shall at all times during excavation, sheeting, shoring and bracing operations have a certified "Competent Person" on site to observe and direct the safe and proper installation of all work covered in this Section.

K. The Contractor shall install the sheeting, shoring and bracing as shown on his/her submitted calculations. No substitute sheeting, shoring or bracing will be allowed unless it is at a minimum in conformance with the requirements of CAL/OSHA and has been submitted and accepted for the record by the Engineer (not reviewed).

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 02512

ASPHALT CONCRETE PAVEMENT AND BASE

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Provide materials and installation of asphalt concrete pavement, base and asphalt concrete overlay within public rights of way.

B. This section is intended to be general in scope and is applicable to all work of this Contract, including principally the following items as may be required in the performance of the Work:

1. Restoration of ground surface over trenches.

2. Restoration or addition of pavement disturbed by the Contractor during his course of work or as directed.

3. Installation of new asphalt overlay as specified in the Contract Documents.

4. Installation of new asphalt concrete as specified in the Contract Documents.

5. Installation of fog seal as specified in the Contract Documents.

C. All streets, highway and other asphalt concrete paved surface improvements excavated or damaged by the Contractor shall be restored by him in accordance with the requirements of these Specifications and shall be subject to inspection and approval by the District. All driveways and other facilities damaged by the Contractor and not under the jurisdiction of a public authority shall be repaired or replaced in kind by the Contractor at no additional cost to District.

1.02 RELATED WORK

A. Earthwork is included in Section 02200.

B. Trenching, Backfilling and Compaction are included in Section 02220.

C. Granular and Rock Materials are included in Section 02230.

D. Pavement Striping and Markings are included in Section 02525.

1.03 REFERENCE DOCUMENTS

A. Asphalt Concrete. Materials and workmanship shall conform to the requirements of Section 39 of the California Department of Transportation Standard Specifications.

B. Asphalt shall conform to the requirements of Section 92 of the California Department of Transportation Standard Specifications.

C. Asphaltic emulsion for seal coat (fog seal coat) shall conform to the requirements of Section 37 of the California Department of Transportation Standard Specifications.

D. Asphaltic emulsion for paint binder (tack coat) shall conform to the requirements of Section 94 of the California Department of Transportation Standard Specifications.

E. Aggregate Base. Materials, spreading and compaction shall conform to Section 26 of California Department of Transportation Standard Specifications.

F. Reference documents specified by governing agency having jurisdiction, if additionally restrictive, shall be used, where applicable.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C117 - Standard Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing

2. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

3. ASTM D6307 - Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method

B. State of California Department of Transportation Standard Plans

C. State of California Department of Transportation Standard Specifications

1.05 SUBMITTALS

A. Submit to the Engineer in conformance with Section 01300:

1. Aggregate base material gradation.

2. Test reports for asphalt concrete and base materials, gradation and quality. Submit for each material to be incorporated into the Work.

3. At the time of delivery of each shipment of asphalt, the vendor supplying the material will deliver to the purchaser certified copies of the test report. The test report shall indicate the name of the vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase number, and results of the specified tests. Submit delivery tickets to the Construction Inspector.

1.06 NOTIFICATION

A. The Contractor shall notify the District in writing at least 5 Working Days in advance of the commencement of paving work.

B. For placement of overlay, the Contractor shall notify the District for inspection at the following times:

1. Completion of cold milling operation
2. Completion of surface preparation prior to application of tack coat
3. Completion of tack coat application
4. Completion of paving operations

1.07 PRODUCT HANDLING

A. Protection

1. Use all means necessary to protect bituminous concrete pavement materials before, during and after installation and to protect the installed work and materials of all other trades.

2. Paving materials delivered to the Site prior to placement shall be stockpiled in such a manner as to minimize surface water impact on the stockpile and minimize intrusion of soils adjacent to and beneath the stockpile.

B. Replacements

1. In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the District and agency having jurisdiction and at no additional cost to the District.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aggregate Base material shall be State of California Department of Transportation Standard Specification Section 26-1.02A Class 2 aggregate base, 3/4-inch gradation. Processed miscellaneous base material conforming to Standard Specifications for Public

Works Construction Section 200-2.5, fine gradation shall be an acceptable alternative aggregate base material.

B. Conventional Asphalt Concrete. Class of asphalt concrete (conventional asphalt concrete) shall be as indicated below. The Contractor shall use a PG-64-10 asphalt binder with Class B aggregate. Class of aggregate may be different to match existing asphalt concrete aggregate. Gradation of aggregate and asphalt content of the mix shall be such that smooth dense finished surface is produced. Unless otherwise shown on the Drawings, the minimum thickness of asphalt concrete excluding overlay shall be 6 inches and the thickness of asphalt concrete overlay shall be 1.5 inches.

C. Asphaltic emulsions shall be composed of a bituminous material uniformly emulsified with water and an emulsifying or stabilizing agent. Polymer modified asphaltic emulsion shall also contain a polymer.

D. Rock Dust Blotter. Rock dust blotter shall be in accordance with Section 200.1.2 of the SSPWC.

PART 3 - EXECUTION

3.01 GENERAL

A. Asphalt Concrete Removal and Replacement. Asphalt concrete permanent pavement shall have a Class B aggregate. The thickness of asphalt concrete excluding overlay shall be the same as existing with a minimum of 6 inches.

B. Asphalt Concrete Overlay. Asphalt concrete overlay shall be conventional asphalt concrete 1.5 inches thick over a 1.5 inches cold mill.

C. Aggregate Base – Caltrans Required. Within the Caltrans jurisdiction, aggregate base is not required when asphalt concrete is placed directly above cement-sand slurry backfill.

3.02 INSTALLATION

A. Cutting or Breaking Paved Surfaces

1. In cutting or breaking up street and roadway surfacing including asphalt and concrete pavement, the Contractor shall not use equipment which will injure or endanger nearby improvements of any type.

2. All Portland cement and asphaltic concrete pavements, gutters, driveways, curbs and sidewalks excavated or damaged shall be removed between neat vertical cuts made with a saw designed for such work. In the case of curbs, gutters and sidewalks, cuts shall be made at the nearest score marks beyond the damaged portion, as may be required in each case by the governing agency. In the event a joint or scoring line does not exist or that

such joint is three feet or more from the removed or damaged portion, the existing concrete shall be removed and reconstructed to neat, plane faces.

3. All pavement sawcuts shall be neat and straight to provide an unfractured and level pavement joint for bonding existing surfacing with pavement replacement. All cut edges shall provide clean, solid, vertical faces free from all loose material. Where large irregular surfaces are removed, such trimming or cutting as hereinafter provided, shall be parallel or at right angles to the road centerline.

4. In excavation areas, pavement shall be removed a minimum of 12 inches beyond excavation.

5. All existing aggregate base and asphaltic concrete removed shall be hauled away from the Site and legally disposed of by the Contractor.

B. Surface Facilities

1. All surface facilities such as monument wells, valve boxes, manhole covers, meter covers, cleanouts, etc. shall be protected from damage during pavement removal or restoration. Any such item damaged or destroyed shall be replaced in kind or repaired to the satisfaction of the agency having jurisdiction.

2. Prior to the start of cold milling for application of asphalt overlay, surface facilities shall be either removed and underlying facility protected or frames and covers be lowered 6 inches below finished grade.

C. Subgrade Preparation

1. Subgrade for pavement or other roadway structures shall not vary more than 0.02 foot from the specified grade and cross-section.

D. Pavement Restoration

1. In all existing pavement areas where the surface is removed, broken or damaged by equipment or in which the ground has caved in or settled due to the installation of the improvements, the surface shall be restored to the original grade by the Contractor. Prior to resurfacing, the existing surfacing shall be removed as specified herein. All broken and jagged edges of the pavement edge shall be sawed straight. Areas to be cut shall be indicated by the District and no permanent pavement shall be placed until these edges have been sawed. If during the initial removal of the existing pavement a method of removal was used which disturbed the adjoining pavement, or if during general construction operations the adjacent pavement or base material was disturbed, then this adjoining pavement must also be removed and replaced. Where irregular surfaces are to be surfaced, existing pavement shall be cut parallel to the alignment of the pipe or to the centerline of the roadway, at the discretion of the District. Asphalt concrete pavement shall be saw cut to a minimum depth of 2 inches

at a point not less than 12 inches outside the limits of excavation or the previous pavement cut (made by pneumatic tools), whichever limits are the greater. Where a trench edge is less than 5 feet from the existing edge of pavement, gutter, or curb, the remaining existing pavement shall be removed and replaced with new base course and pavement.

2. Wherever asphalt cement pavement does not terminate against a curb, gutter, or another pavement, the Contractor shall provide and install a redwood header and stakes. Such headers and stakes shall remain in place upon completion of the improvements.

3. Headers shall be 2-inch (nominal size) boards, the vertical dimension of which shall at least be equal to the thickness of the pavement at the header line. Side stakes 2 inches by 3 inches (nominal size), 18 inches long or longer, and spaced not over 4 feet apart shall be driven on the outside of the headers to a depth of 1 inch below the top and then nailed to the header. The joints between the individual boards being used as headers shall be spliced with a 1-inch thick (nominal size) board of the same height as the header and not less than 24 inches long. Headers and stakes shall be redwood.

4. Permanent pavement shall be placed prior to removing traffic control and allowing traffic to travel through the area. This requirement applies to both potholes and installation of the Work.

5. The pavement to be restored by the Contractor shall include all classes and types of pavements whether in main roadways, shoulders, curbs, gutters, driveways or sidewalks.

6. In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall cut back and trim the edges so as to provide a clean sound, vertical joint, before permanent replacement of an excavated or damaged portion of pavement, gutter, driveway, curb or sidewalk with the same kinds of materials as used in the original construction, and to the same thickness and other applicable dimensions, as nearly as may be, in such manner as to restore the affected portions of all said pavement facilities to a sound and serviceable condition satisfactory to the District and the agency having jurisdiction.

7. Where cement-sand slurry is used as a base to backfill excavations up to bottom of asphalt paving, as specified in the Contract Documents, aggregate base shall not be placed except as shown on the Plans or otherwise specified.

8. An herbicide effective against native grasses and weeds of the area shall be applied on top of the subgrade in the quantity and according to the methods recommended by the manufacturer.

9. Prime coat shall be applied to in-place base at a rate as recommended by the manufacturer and as required by Caltrans.

10. Place and compact asphalt concrete to match original finished surface. Placement of asphalt concrete overlays 8 feet or wider shall be done by use of an automated asphalt paving machine specifically designed for the placement of asphalt paving. Placement of asphalt concrete within excavated trench or other smaller areas shall be done by use of an automated asphalt paving machine specifically designed for the placement of asphalt paving or a riding, vibrating, asphalt roller. Placement of any permanent asphalt concrete with hand tools or walk behind devices will not be allowed. Physical appearance and quality of surface shall be as follows:

    a. All roller marks shall be eliminated and a density of 95% minimum to 98% maximum shall be achieved per California Test 304.

    b. The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

    c. When a straightedge 12 feet long is laid on the finished surface and parallel with the center line, the surface shall not vary more than 0.01-foot from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-foot are present when tested with a straightedge 12 feet long laid in a direction transverse to the center line and extending from edge to edge of a 12-foot traffic lane or road section.

11. Prior to placement of fog seal, Contractor shall clean pavement surface of foreign contaminants such as striping, markings, epoxy and glue residue , and other such material which may provide poor adhesion to the paved surface or reflect through the fog seal (color or texture).

12. Apply fog seal of the Grade SS1h at the rate of 0.1 gallon per square yard. Application of fog seal is not required where area is to receive subsequent asphalt overlay.

13. Apply rock dust blotter to prevent tracking. Rock dust shall not be spread until intermediate rolling is complete and pavement temperatures have dropped below 200 degrees Fahrenheit.

E. Asphalt Overlay

1. Perform asphalt overlay where indicated on the Drawings.

2. Following cold milling of pavement surface, cleaning and preparation for asphalt overlay shall be performed at least 24 hours and not more than 72 hours prior to overlay operations.

3. Width of asphalt overlay at street or driveway intersections shall be calculated as a straight line along the edge of pavement across the intersection the other side of the intersection.

4. Asphalt overlay shall be performed after all heavy equipment has been demobilized off the project area and pavement restoration is complete. The Contractor shall arrange his work such that none of the Contractor's equipment heavier than H-20 loading is allowed to travel over the new asphalt overlay.

5. Cold milled surfaces shall not be less than 1/8-inch the mill depth required.

6. Prior to placement of tack coat, pavement to receive overlay shall be thoroughly cleaned by sweeping and vacuuming of area. All loose and deleterious matter shall be completely removed. The use of hand cleaning tools is not allowed in areas accessible by motorized equipment.

7. Placement of asphalt concrete overlay shall be done by use of an automated asphalt paving machine specifically designed for the placement of asphalt paving. Placement of permanent asphalt concrete with hand tools or walk behind devices will not be allowed. Physical appearance and quality of surface shall be as follows:

    a. Placement of asphalt concrete overlay shall be in conformance with the requirements of Caltrans and as modified in the Contract Documents.

    b. All roller marks shall be eliminated and a density of 95% minimum to 98% maximum shall be achieved per California Test 308.

    c. The completed surfacing shall be thoroughly compacted, smooth and free from ruts, humps, depressions or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations or other objectionable marks in the asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

    d. When a straightedge 12 feet long is laid on the finished surface and parallel with the center line, the surface shall not vary more than 0.01-foot from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-foot are present when tested with a straightedge 12 feet long laid in a direction transverse to the center line and extending from edge to edge of a 12-foot traffic lane or road section.

8. Apply tack coat of Grade SS1h on existing horizontal and vertical surfaces to come in contact with new asphalt pavement at the rate of 0.1 gallon per square yard.

9. Apply fog seal of the Grade SS1h at the rate of 0.1 gallon per square yard.

F. Installation of New Pavement

1. Place the minimum asphalt concrete specified herein unless otherwise shown on Drawings or as required thicker by agency having jurisdiction. Placement of asphalt concrete shall be done by use of an automated asphalt paving machine specifically designed for the placement of asphalt paving. Placement of permanent asphalt concrete with hand tools or walk behind devices will not be allowed.

2. Pavement adjacent to structures and in other areas inaccessible to heavy rollers shall be compacted by means of heated hand tools.

3. All manholes, valve boxes and other surface structures (surface facilities) shall be brought to new paved grades, as required and in accordance with the requirements of the agency having jurisdiction.

4. Following restoration of surface facilities, lids and covers shall be cleaned and painted with one coat of black paint.

G. Clean-Up

1. During the Work, all roads, public and private, shall be kept clean and neat. Any debris, rubbish, unused materials or equipment shall be expeditiously removed.

2. Contractor shall be responsible for the complete removal of asphaltic material tracking and staining over concrete surfaces to the satisfaction of the District and agency having jurisdiction. Any removal shall not alter the physical appearance of the concrete such that it would be visually different than surrounding concrete once cleaned. Street striping and marking, if stained, shall be cleaned of all staining or damaged areas shall be removed and replaced in kind.

H. Acceptance

1. All pavement restoration and repair shall be completed to the satisfaction of the public agency having jurisdiction. District will not issue the Statement of Acceptance for the Work until the District has received approval from the public agency having jurisdiction that the Work has been satisfactorily completed.

3.03 MAINTENANCE OF SURFACE

A. Following the certification of completion by the District, the Contractor shall maintain the surface of the re-paved, overlayed and new pavement areas for a least the period of the guarantee of the Work.

B. All materials and labor required for the maintenance of paving shall be supplied by the Contractor, and the Work shall be done in a manner satisfactory to the District.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 02623

HDPE PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install high-density polyethylene (HDPE) pipe and fittings in areas shown on the Drawings.

1.02 RELATED WORK

A. Earthwork is included in Section 02200.

B. Trenching, Backfilling and Compaction are included in Section 02220.

C. Surface Preparation and Shop Painting and Coating are included in Section 09910.

D. Field Painting and Protective Coating are included in Section 09920.

1.03 SUBMITTALS

A. Test reports and certificates for qualification of pipe manufacturer for specified pipe size and material code designation.

B. Pipe and fitting materials submittal shall include:

1. Manufacturing method and material standards
2. Grade of material
3. Wall thickness and tolerances
4. Pressure rating
5. Fitting fabrication details

C. A detailed plan and description of recommended method for butt fusion of pipe, its procedure and parameters, and recommended equipment.

D. Certificates of qualifications of technicians/operators that will perform butt fusion for joining HDPE pipe and fittings. The pipe and fitting manufacturers shall also approve, in writing, qualifications of heat fusion equipment and operators/technicians. Operator/technician shall have the minimum experience as specified in 1.05 of this Section.

E. If HDPE pipe and fittings are manufactured/fabricated by different organizations, then each organization shall submit a written guarantee stating compatibility between pipe and fittings such that they will perform together in accordance with the requirements of the

Specifications.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM D638 - Standard Test Method for Tensile Properties of Plastics
2. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
3. ASTM D1238 - Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
4. ASTM D1248 - Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
5. ASTM D1505 - Standard Test Method for Density of Plastics by the Density- Gradient Technique
6. ASTM D1599 - Standard Test Method for Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings
7. ANSI/ASTM D1603 - Standard Test Method for Carbon Black in Olefin Plastics
8. ASTM D1693 - Standard Test Method for Environmental Stress – Cracking of Ethylene Plastics
9. ASTM D2122 - Standard Method of Determining Dimensions of Thermoplastic Pipe and Fittings
10. ASTM D2290 - Standard Test Method for Apparent Tensile Strength of Ring or Tubular Plastics and Reinforced Plastics by Split Disk Method
11. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
12. ANSI/ASTM D2839 - Standard Practice for Use of a Melt-Index Strand for Determining Density of Polyethylene
13. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter
14. ASTM D3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
15. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Material

16. ASTM D4218 - Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique

17. ASTM F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR- PR) Based on Outside Diameter

B. American Water Works Association (AWWA)

1. AWWA C906 – Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 in. Through 63 in. for Water Distribution

C. Plastic Pipe Institute (PPI)

1. PPI TR-3 - Policies and Procedures for Developing Hydrostatic Design Basis (HDB), Hydrostatic Design Stresses (HDS), Pressure Design Basis (PDB), Strength Design Basis (SDB), and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe

2. PPI TR-4 - PPI Listing of Hydrostatic Design Bases (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe

1.05 QUALITY ASSURANCE

A. The Owner will make inspection of the pipe and fittings after delivery. The pipe shall be subject to rejection at any time because of failure to meet any of the requirements specified herein, even though sample pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the Site immediately and shall not be allowed to be reworked or reused on any portion of the project.

B. All materials used in the manufacture of the pipe shall be tested at the factory in accordance with the requirements of AWWA C906, as applicable, and the requirements herein.

C. All straight lengths of HDPE pipe shall be from a single manufacturer.

D. Workmanship and Testing

1. The Owner may select the time and pipe or fitting piece to be tested except for at the beginning of production run that will be conducted as specified herein.

2. The manufacturer shall take adequate measures in the checking of incoming materials and in the production of pipe to ensure compliance with the requirements of these Specifications and AWWA 906.

E. Heat Fusion Machine and Fusion Technician

1. The heat fusion machine(s) shall be capable of providing a detailed computer-recorded report of fusion parameters at each joint. Pipe fusion will not be allowed if the computer-recorder is not provided or functioning properly. Manually kept records of fusion parameters for main line HDPE pipe will not be an acceptable substitute for computer-generated reports submitted to the Owner.

2. All pipe fusion machine operator(s)/technician(s) shall have a minimum of 5 years experience in the fusion of solid wall HDPE pipe, with a combined total length of pipe fused of at least 4,000 feet. Pipe fusion operator(s)/technician(s) shall have fused at least 2,000 feet of solid wall HDPE pipe 8 inches or larger within the last 3 years.

   Fusing of pipe will not be allowed unless the operator(s)/technician(s) performing the work meets these experience requirements.

3. Each fusion machine to be used by the Contractor shall be certified by the manufacturer or manufacturer's authorized agent (which shall not be the Contractor) as being in proper working order capable of performing the work intended, excepting that the manufacturer's authorized agent cannot be an agent which, in addition to representing the manufacturer, provides HDPE pipe fusing services directly or indirectly to the Contractor. Prior to certification, each fusion machine shall be checked and calibrated by the same company.

1.06 DELIVERY, HANDLING, AND STORAGE

A. Marking

1. Pipe and fittings shall bear identification markings that will remain legible during normal handling and storage. The marking shall be printed indelibly in ink, or molded thereon in a manner that will not reduce the strength or otherwise damage the pipe.

2. Marking on the pipe shall be applied so that intervals between markings are no longer than 5 feet. Marking on the pipe and fittings shall include the following:

   a. Manufacturer's name or trademark
   b. Nominal size and OD base
   c. Standard material code designation
   d. Dimension ratio
   e. Pressure class
   f. AWWA designation number, AWWA C906-90
   g. Manufacturer's lot number, production code including day, month, and year (Manufacturer's code must allow traceability to supplier of raw material.)
   h. Material test category

B. Delivery, Handling, and Storing

1. All pipe and fittings shall, unless otherwise specified, be prepared for standard commercial shipment.

2. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Pipe shall be delivered to the Site properly secured on delivery trucks to prevent damage or excessive ovaling of the pipe. Stacking and support methods shall be per manufacturer's recommendations.

3. Pipe shall be stored on site neatly and on flat level ground, properly supported to prevent rolling or damage to the pipe. Storage of pipe shall be per manufacturer's recommendations.

PART 2 - PRODUCTS

2.01 MATERIAL

A. Materials used for the manufacture of polyethylene pipe and fittings shall be extra high molecular weight, high density ethylene/hexene copolymer PE 3408 polyethylene resin meeting the following physical property and pipe performance requirements:

Property	Specification	Units	Nominal Values
Material Designation	PPI/ASTM	-	PE3408
Cell Classification	ASTM D-3350	-	334434C (Min.)
Density	ASTM D-1505	gm/cm3	0.955
Melt Flow	ASTM D-1238	Gm/b mm	0.11 @ 2.16 kg (1)
Flex Modulus	ASTM D-790	Psi	135,000 (2)
Tensile Strength	ASTM D-638	Psi	3,000 (3)
ESCR	ASTM D-1693	F_0, Hrs.	$F_0 > 5000$
HDB @ 73^{0}F	ASTM D-2837	Psi	1,600
U-V Stabilizer	ASTM D-1603	%C	2.5

(1) Average Melt Index Value with a standard deviation of 0.01.
(2) Average Flexural Modulus with a standard deviation of 2000 psi.
(3) Average Tensile Stress at Yield with a standard deviation of 150 psi.

C. The pipe and fitting material shall be listed by PPI (the Plastics Pipe Institute, a division of the Society of the Plastics Industry) in PPI TR-4 with a 73°F hydrostatic design stress rating of 800 psi, and a 104°F hydrostatic design stress rating of 400 psi. The PPI listing shall be in the name of the pipe manufacturer, and shall be based on ASTM D-2837 and PPI TR-3 testing and validation of samples of the pipe manufacturer's production pipe.

D. The Manufacturer's certification shall state that the pipe was manufactured from one specific resin in compliance with AWWA C-906.

2.02 PIPE

A. The DR (Dimension Ratio), of the pipe supplied shall be as specified on the Drawings. Measurements shall be made according to the methods specified in ASTM D2122. Variation of pipe wall thickness as measured and calculated according to ASTM D2122 in any diametrical cross section of the pipe shall not exceed 12 percent.

B. Pipe shall be homogeneous throughout, uniform in color, opacity and density, and free from sticky or tacky material. The pipe walls shall be free from cuts, cracks, holes, blisters, voids, foreign inclusions, or other defects that are visible to the naked eye and that may affect the wall integrity.

C. HDPE straight lengths of pipe shall be manufactured black. The black color of the pipe shall be derived from a well-dispersed and finely divided carbon black. Sufficient antioxidant shall be added to meet thermal stability requirements contained in ASTM D3350.

D. All pipe shall have product traceability.

2.03 FITTINGS

A. Fittings to be joined to polyethylene piping shall be manufactured for thermal heat fusion. Polyethylene fittings may be molded, thermoformed from pipe sections, or fabricated by heat fusion joining polyethylene components prepared from pipe, molded fittings, thermoformed pipe, or polyethylene sheet or block. Fiberglass wrap or other similar wrap will not be allowed for the fabrication of fittings. Molded fittings shall meet the requirements of ASTM D3261 for butt-type fittings, and the requirements of this Specification.

B. Fittings shall be designed for a minimum working pressure the same as the working pressure for the pipe.

C. Fittings shall be homogeneous throughout and essentially uniform in color, opacity, density, and other properties. The inside and outside surfaces shall be semi-matte to glossy in appearance and free from sticky or tacky material. The walls shall be free from cuts, cracks, holes, blisters, voids, foreign inclusions, or other defects that are visible to the naked eye and that may affect the wall integrity.

D. Molded fittings shall conform to the dimensional requirements set forth in the applicable ASTM fitting standard. Fabricated fittings shall meet the minimum dimensional requirements and tolerances of the pipe at the point of fusion.

E. Each polyethylene fusion fitting shall meet all the material requirements established for the pipe to which the fitting is to be joined.

F. All fittings shall be properly rated according to the manufacturer's written recommendations, and clearly labeled on each fitting as such. In any event, after rating, each fitting shall be designed and manufactured to operate at not less than the design pressure of the pipe system for which it is intended with an included 2:1 safety factor.

G. Standard fittings are tees, elbows, flange adapters, reducers, transition fittings, branch and service saddles, and hot-tap tees.

H. All fittings shall have product traceability. This shall be accomplished by the inclusion of markings as specified in Paragraph 1.06 of this Section.

I. All fittings shall be fabricated, complete, at the manufacturer's facility unless otherwise allowed by the Owner in writing.

2.04 JOINING

A. Polyethylene piping shall not be joined by solvent cements, adhesives (such as epoxies), or threaded-type connections.

B. Unless otherwise shown on the Drawings or as approved by the Owner, all HDPE pipe shall be butt fused according to ASTM D3261 and the manufacturer's recommendations. Flange adapters and back-up flanges shall be used where shown on the Drawings.

C. All ferrous metal couplings, adapters, and other appurtenances shall be protected in accordance with Sections 09910 and 09920.

PART 3 - EXECUTION

3.01 LAYING PIPE AND FITTINGS

A. Handling and laying of pipe and fittings shall be in accordance with the manufacturer's instructions, as specified herein, and to line and grades as shown on the Drawings.

B. Do not drop pipe or fittings. All pipe or fittings shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to the pipe shall be repaired as directed by the manufacturer and approved by the Engineer. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner at the Contractor's own expense.

C. All pipe and fittings shall be thoroughly cleaned before fusing and shall conform to the lines and grades required when laid. Fittings, in addition to those shown on the Drawings, shall be provided, if required, for crossing utilities or other obstructions that may be encountered upon opening the trench.

D. Continuous dragging of long lengths of pipe for transport or installation will not be allowed. Damage to pipe, caused by dragging is the responsibility of the Contractor and may be cause for repair or replacement of damaged portion as determined by the Owner.

E. Damage such as scratches, gouges, defects, or any other type found on the inside or outside of the pipe greater than 10% of the pipe wall thickness shall be cause for the Contractor to remove the damaged section by removing entire piece of pipe from the Site or cutting out a segment of the pipe where the damaged portion is identified plus 2 inches to both sides of the damaged portion. Any rejected damaged pipe piece or portion of pipe section shall be immediately removed from the Site.

F. Pipe shown to be installed on top of the ground shall follow the natural contour of the existing surface. The Contractor shall not be allowed to alter the natural grade without permission from the District. Vertical direction changes shall be accomplished by fittings and/or bending of the pipe in accordance with the requirement of this Section. The Contractor shall make careful and precise measurements to determine the best method to accomplish the vertical alignment.

G. Chains or cable type chokers will not be allowed when lifting pipe. Nylon or other wide fabric slings or other similar lifting apparatus with spreader bars, shall be used where necessary.

H. Prior to installing a pipe section, the bedding material shall be brought to grade along the entire length of the section to be installed. The pipe bedding materials shall be as shown on the Drawings and per these Specifications.

I. Bending of the pipe to achieve horizontal or vertical changes in direction is allowed. The minimum bending radius, measured along the centerline axis of the pipe is 50 times the nominal pipe size.

J. The Contractor shall excavate holes in the trench as required to permit removal of the slings, install flanges and providing coating and protective covers.

K. As pipe laying progresses, the Contractor shall keep the pipe interior free of all debris. The Contractor shall flush the interior of the pipe of all sand, dirt, and any other debris following completion of pipe laying and fusing of joints prior to testing the completed pipeline.

L. Until the pipe is backfilled, trench shall be free of water and kept dry to avoid flotation of the pipe. Laying of pipe with water in trench shall not be allowed.

M. The Contractor shall provide anchors if required and as recommended by the pipe manufacturer and approved by the Owner to avoid flotation of pipe until the pipe is backfilled at no additional cost to the Owner.

N. Backfill trench in accordance with these Specifications and Drawings.

3.02 HEAT FUSION OF PIPE

A. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions and procedures recommended by the pipe manufacturer, including, but not limited to, temperature requirements, alignment, interfacial fusion pressure, and automatic recording of parameters for jointing.

B. Joining of HDPE pipe by butt fusion shall be performed by qualified technicians with experience complying with the requirements of Paragraph 1.05.I of this Section. The heat fusion machines shall be approved or supplied by the pipe manufacturer and shall be capable of providing a detailed report of fusion parameters at each joint.

C. Sections of polyethylene pipe shall be joined into continuous lengths on the Site above ground or in the pipe trench as applicable or required.

D. Heat fusion joining shall be 100% efficient offering a joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used. Extrusion welding or hot gas welding of HDPE shall not be used.

E. Butt fusion procedure shall include the following steps, but not be limited to:

1. Securely fasten the pipe to be joined
2. Face the pipe ends
3. Align the pipe profile
4. Melt the pipe interfaces at recommended temperature
5. Join the two profiles together
6. Hold under recommended pressure
7. Cool down period.

F. In situations where different polyethylene piping materials must be joined, both pipe manufacturers shall be consulted to determine the appropriate fusion procedures.

G. Submit detailed fusion joint reports as recorded by the heat fusion machine for all joints. If any joint as indicated by these reports is found to be unsatisfactory, the Contractor shall remove portions of the pipe containing such joint and install a new pipe piece as required and approved by the Owner.

H. The first butt fusion shall be a trial fusion to be performed in the field in the presence of the District. The trial fusion shall be allowed to cool completely, and then fusion test straps shall be cut out. The test strap shall be the longer of 12 inches or 30 times the wall thickness in length with the fusion in the center, and 1-inch minimum or 1.5 times the wall

thickness in width. The test strap shall then be bent until the ends of the strap touch. If the fusion fails at the joint, a new trial fusion shall be made, cooled completely and tested.

Butt fusion of the pipe to be installed shall not commence until the trial fusion has passed the bent strap test.

I. Following the successful initial trial fusion, the bent strap test shall be performed once every fiftieth joint or once per month, whichever comes first.

J. Field heat fusion of sidewall outlets shall not be allowed in the field unless directed by the Owner.

3.03 CROSSING AND RELOCATING EXISTING UTILITIES

A. Perform any work required in crossing culverts, watercourses, including brooks and drainage ditches, storm drains, gas mains, water mains, electric, telephone, gas and water services and other utilities. This work shall include bracing, hand excavation, backfill and any other work required for crossing the utility or obstruction. Notification of utility companies shall be as specified elsewhere in the Specifications.

B. In locations where existing utilities cannot be crossed without interfering with the construction of the Work as shown on the Drawings, contact Owner immediately for direction.

C. At pipe crossings and where designated by the Owner, firmly support the existing utility or pipe for its entire exposed length.

3.04 PIPE REPAIR AND REPLACEMENT

A. If pipeline fails any of the requirements specified herein, including deflection, physical damage, inadequate beading of joints, etc., the affected length of pipe as determined by the Owner shall be repaired or removed and replaced. The option of repair or removal and replacement shall be at the discretion of the Owner and at no additional cost to the Owner.

3.05 CLEANING

A. At the conclusion of the Work, thoroughly clean all of the new pipelines to remove all dirt, stones, and pieces of wood or other debris that may have entered during the construction period.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 02820

LANDSCAPING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work of this Section includes providing landscaping and all appurtenant work to restore disturbed areas to original condition or to a condition specified herein.

B. Landscaping as referred to herein shall include soil preparation, installation of headers, weed control, finish grading, furnishing and installing seeds, plant materials, tree staking and tying, and all other pertinent work as required and as indicated.

1.02 RELATED WORK

A. Earthwork is included in Section 02200.

B. Granular and Rock Materials are included in Section 02230.

1.03 STANDARD SPECIFICATIONS

A. Except as otherwise indicated in this Section of the Specifications, the Contractor shall comply with the Standard Specifications for Public Works Construction (SSPWC).

1.04 CODES

A. Agricultural Code of the State of California

1.05 REFERENCE STANDARDS

A.	ANSI/ASTM D 422	Method for Particle-Size Analysis of Soils
B.	ANSI Z60.1	Nursery Stock
C.	American Association of Nurserymen, Inc.	Rules and Grading Provisions

1.06 SUBMITTALS

A. The following shall be submitted:

1. Type of vegetation to be planted.

2. Vegetation establishment plan. Plan shall include detail on how vegetation will be irrigated for the guarantee period or as indicated in this Section.

3. Hydroseed mix, including application rate, seed type percentages, mulch, fertilizer, etc.

1.07 CERTIFICATES TO BE FURNISHED WITH EACH DELIVERY OR SHIPMENT

A. Certificates of inspection of plant material concerning plant diseases and infestations, as required by federal, state, or other authorities having jurisdiction, shall be furnished with each shipment.

1.08 INSPECTION

A. All indicated inspections will be made by the Owner and the agency or property owner having jurisdiction. The Contractor shall request inspection at least 1 Working Day in advance of the time inspection is required. Inspection will be required on the following stages of the work:

1. Following finish grading and application of soil amendments if required.

2. When all specified planting work in an area has been completed.

3. Final inspection at the completion of the maintenance period.

B. Plants and seeds will be subject to inspection and approval or rejection by the Owner and the agency having jurisdiction or property owner at the place of growth and upon delivery to the Site at any time before and during progress of the Work. Plants and seeds will be inspected for:

1. Quantity, quality, size, and variety.

2. Latent defects and injuries resulting from handling, disease, and insects.

C. Plants approved at the place of growth shall be rejected at the Site if found to have degraded ball and root conditions or latent defects and injuries.

D. Rejected plants shall be identified in an obvious manner, removed from the Site and replaced with acceptable equals.

1.09 CLEANUP

A. Upon completion of planting operations in any area, the portion of the Site used for a work by the Contractor shall be cleaned of all debris, superfluous materials, and equipment.

B. All walks or pavement with open access to the public shall be swept or washed clean daily and again upon completion of the planting work.

C. Overspray from hydroseeding shall be thoroughly cleaned from all surfaces during or immediately upon completion of hydroseeding.

D. During the Work, plant containers that have been cut or removed from plant materials shall be removed from the Site daily.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Plants shall not be pruned prior to delivery except upon approval by the Owner and the agency having jurisdiction or property owner.

B. If plants delivered to the Site are not immediately planted, the Contractor shall protect the stock in a temporary nursery where it shall be protected from sun and drying winds and shall be shaded, kept moist, and protected with damp soil, moss, or other material. Plants shall be planted within 2 Calendar Days after delivery.

C. Fertilizers, additives, seed, peat, etc. subject to moisture damage shall be kept in a weatherproof storage place to preserve dryness.

PART 2 - PRODUCTS

2.01 GENERAL

A. Landscaping materials shall conform to the requirements of SSPWC Subsection 212-1 and the requirements of this Section of the Specifications.

B. All landscaping materials for soil conditioning, weed abatement, or planting shall be first-grade, commercial quality. If requested by the Owner, submit certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or provided with each delivery. Delivery certificates, if requested by the Owner, shall be given to the Owner as each shipment of material is delivered.

C. All plants furnished by the Contractor shall be true to type or name as the original plant it is to replace and shall be tagged in accordance with the standard practice recommended by the Agricultural Code of the State of California.

D. Established existing sod shall be replaced with sod in kind. Hydroseeding or other such method of seed planting shall not be allowed as a substitute for the placement of sod. If a disturbed area was generally landscaped with sod, then new sod shall be installed within the disturbed area even though the existing sod may not have covered the disturbed area.

2.02 TOPSOIL

A. Existing Improved Landscaped Areas. The topsoil in existing improved landscape areas shall be the same soil recovered from the area during excavation and be free of roots, clods, stones larger than 1-inch in the greatest dimension, pockets of coarse sand, noxious weeds, sticks, lumber, brush and other litter. Topsoil shall be friable and have sufficient structure in order to give good tilth and aeration to the soil.

B. Existing Native/Unimproved Areas. The topsoil in existing improved landscape areas shall be the same soil recovered from the area during excavation or be imported topsoil and be free of roots, clods, stones larger than 1 inch in the greatest dimension, pockets of coarse sand, noxious weeds, sticks, lumber, brush and other litter. Topsoil shall be friable and have sufficient structure in order to give good tilth and aeration to the soil.

C. Existing Agricultural Areas. The topsoil in existing agricultural areas shall be the same soil recovered from the planting area during excavation or be imported topsoil and be free of roots, clods, stones larger than 1 inch in the greatest dimension, pockets of coarse sand, noxious weeds, sticks, lumber, brush and other litter. Topsoil shall be friable and have sufficient structure in order to give good tilth and aeration to the soil. Soil in agricultural access roads shall not be considered topsoil and shall not be stored with topsoil or mixed with or used for backfill in planting areas.

2.03 FERTILIZERS AND ADDITIVES

A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.

2.04 ORGANIC SOIL AMENDMENT

A. Organic soil amendment shall be Type 2 complying with SSPWC Subsection 212-1.2.4.

2.05 MULCH

A. Mulch ground cover shall be Agromin ES-2 or an approved equivalent. A 2" mulch blanket shall be spread evenly over planting areas but not in vehicular travel paths, hydroseed or sod areas.

2.06 PLANTS

A. Plants furnished for replacement of existing plants shall be the same as existing and comply with SSPWC Subsection 212-1.4 and shall meet requirements of the agency having jurisdiction or property owner and these Specifications. Plants shall be in accordance with the botanical names and applicable standards of quality, size, condition, and type. They shall be true to name, genera, species, and variety in accordance with reference publications.

B. No trees will be accepted with their leaders cut, or so damaged that cutting is necessary.

C. Plants shall be healthy, vigorous and free from plant disease, shall be well branched, shall have full foliage when in leaf, and shall have a healthy, well-developed normal root system. Cold storage plants will not be accepted.

D. Trees shall comply with SSPWC Subsection 212-1.4.2 and shall have straight trunks and all old abrasions and cuts shall be completely callused over. In no case shall trees be topped before delivery.

2.07 HYDROSEED

A. Hydroseed shall be a non-irrigation mulch mix of 89% native shrubs, 10% native grass and 1% wildflowers as provided by Quality Hydroseeding & Restoration or an approved equivalent. Non-irrigation mulch mix shall be planted and irrigated to establish seeded plants.

B. Following establishment of plants by the Contractor, hydroseeded areas will not have irrigation. Plant seeds for the hydroseed mix shall be selected to be drought tolerant and suited for the geographic area planted.

C. Hydroseed mix shall have a dark contrasting color to the area being hydroseeded. Color shall be such that adequate coverage of the hydroseeded area can be visually inspected for approval.

2.08 SOD

A. Sod shall be the same as removed and as approved by the agency having jurisdiction or property owner and Owner. Grass seeds, stolons or hydroseeding shall not be used to resurface areas with existing sod.

2.09 TURF REINFORCEMENT MAT

A. Turf reinforcement mat (TRM) shall be a woven fully synthetic fabric manufactured specifically for erosion protection of slope gradients and promotion of seeded vegetation growth.

B. TRM shall be ultraviolet stable and suitable for permanent installation with an expected service life of at least 25 years. Biodegradable in whole or in part TRM will not be acceptable.

C. TRM shall be primarily furnished in rolls to allow continuous installation with minimal vertical overlap and a width to minimize horizontal overlap.

D. Weight of TRM shall be at least 9.2 ounces/square yard

E. TRM shall be model PP5-Heavy Duty as manufactured by Western Excelsior or an approved equivalent.

F. Mat anchors and twist pins shall be as recommended by the TRM manufacturer.

2.10 MISCELLANEOUS MATERIALS

A. Use plastic edging with tubular top edge or if replacing existing edging, use identical type of edging as removed, where edging is required.

2.11 MANUFACTURERS

A. Landscaping materials shall be of the following brand names (or equal):

1. Fertilizer tablets: "Agriform" or "Leslie"

PART 3 - EXECUTION

3.01 GENERAL

A. Landscape work shall be performed in compliance with SSPWC Section 308 and as indicated herein.

B. The landscape work shall not be performed at any time when it may be subject to damage by climatic conditions.

C. Prior to removal of existing vegetation in improved landscape areas, the Contractor shall identify the area of removal and inventory plants to be removed. Inventory list shall contain both name of plant and quantity to be removed and be submitted to the Owner for approval. No removal of plants will be allowed until approval from the Owner and agency having jurisdiction are obtained by the Contractor.

D. Any failed areas of seeding or sodding or death of any plants during the guarantee period shall be cause for the Contractor to replant the failed areas at no additional cost to the Owner.

E. Although specified hydroseeding is of the non-irrigation type, irrigation/watering may still

be required to quickly establish vegetation.

3.02 SOIL PREPARATION

A. Landscaping shall not begin until all areas of settlement, erosion, rutting, etc., have been repaired, and the soils have been re-established, recompacted, and refinished to finish grades.

B. Areas requiring grading, including adjacent transition areas, shall be uniformly level or sloping between finish elevations to within 0.10 foot above or below required finish elevations.

C. Landscaping shall not proceed until after walks, curbs, pavings, edging, and irrigation systems are in place. Other work shall be completed to a degree where the landscape areas will not be disturbed when the other work is completed. The subgrade shall be cleaned free of waste materials of all kinds.

D. During grading, waste materials in the planting areas such as weeds, rocks 2 inches and larger, building materials, rubble, wires, cans, glass, lumber, sticks, etc. shall be removed from the Site. Weeds shall be dug out by the roots in improved landscape areas.

E. After removal of waste materials the planting areas subgrade shall be scarified and pulverized to a depth of not less than 6 inches and all surface irregularities below the cover of topsoil removed.

F. Finish grading shall consist of:

1. Placing all soil additives and fertilizers.

2. Making minor adjustment of finish grades as directed by the Owner and agency having jurisdiction.

G. Any unusual subsoil condition that will require special treatment shall be reported to the Owner.

H. Topsoil shall be uniformly distributed over all areas where required. Subgrade and topsoil shall be damp.

I. Surface drainage shall be provided as shown by molding the surfaces to facilitate the natural run-off of water. Low spots and pockets shall be filled with topsoil and graded to drain properly.

J. Finish grade of all planting areas shall be 1 inch below finish grades of adjacent pavement of any kind.

K. Jute mesh shall be installed loosely up and down 4:1 or greater slopes. The installed

mesh shall fit the soil surface contour and shall be held in place by 12-inch long, 11-gauge (minimum) steel wire staples driven vertically into the soil at approximately 24-inch spacing. Jute mesh strips shall overlap along the sides at least 6 inches. Ends of strips shall be buried into the soil at least 6 inches. Staples shall be driven into side overlap at 2 points per side overlap.

3.03 PROTECTION AND HANDLING OF PLANTS

A. Plants shall be planted on the day of delivery, if possible.

B. Plants shall not be picked up or moved by stem or branches, but shall be lifted and handled from the bottom or sides of the containers.

C. Plants shall be lifted and handled from the bottom of the ball. Plants with balls cracked or broken before or during planting operations will not be accepted and shall be immediately removed from the work site.

3.04 PROTECTION AND HANDLING OF SOD

A. Sod shall be placed the same day as delivery and shall not be allowed to dry out.

B. Addition, type, and frequency of sod fertilizing shall be in accordance with the suppliers or manufacturer's recommendations.

C. Sod bare areas or voids under sod between the sod and finished ground shall not be allowed.

3.05 TREE AND PLANT LOCATIONS

A. The Contractor shall locate and stake all tree and shrub locations and have the locations approved by the Owner and agency having jurisdiction or property owner before starting excavation for same. The plant locations shall be observed and their locations shall be adjusted as directed by Owner or agency having jurisdiction or property owner before final approval.

B. No trees shall be located closer than 72 inches to structures unless otherwise indicated. Ground covers and shrubs may be planted up to structures or curbs.

3.06 PLANT PITS

A. Plant pits, centered on location stakes, shall be excavated circular pits with vertical sides and flat or saucer shape bottom in accordance with the following sizes unless shown otherwise:

1. Depth shall equal that of the soil in the container. Width will be twice as wide as the container soil.

3.07 PREPARED BACKFILL

A. Tree and shrub pit backfilling soil shall consist of 4 parts topsoil, and 1 part peat or soil-aid by volume. Commercial fertilizer shall be mixed with the prepared topsoil, using 5 lb/cu yd or as required by manufacturer's printed recommendations.

B. Planting pit, bin, and trench filling and bedding soil shall consist of 4 parts by volume topsoil mixed with 1 part manure and 5 lb of commercial fertilizer per cubic yard. Specification applies to import and on-site soil.

C. Materials shall be thoroughly rotary-mixed on the Site before placement. Mixing of additives in pits, bins, trenches or beds will not be permitted.

D. Tree and shrub pits shall be provided with fertilizer tablets as follows:

1 per one-gallon can plant
3 per 5-gallon can plant
5 per 15-gallon can plant

3.08 ROCKS OR UNDERGROUND OBSTRUCTIONS

A. In the event that rock or underground obstructions are encountered in the excavation of plant pits, alternative locations shall be selected by the Owner or agency having jurisdiction. Moving of trees to alternative locations shall not be reason for Extra Work.

3.09 SETTING PLANTS, SHRUBS AND TREES

A. The soil shall not be worked when the moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form or that clods will not break readily. Water shall be applied if necessary to provide ideal moisture for filling and for planting as herein indicated.

B. Plants shall be set in center of pits as indicated. They shall be set plumb and straight and at such a level that after settlement the crown of the plant will be 2 inches above the finished grade.

C. All ground cover plants shall be evenly spaced, staggered in rows, and set at the intervals indicated to produce a uniform effect. Plants shall be watered immediately after planting operations have been completed.

D. All shrubs and vines shall be pruned to remove damaged branches. All bare root shrubs shall be pruned and shaped to compensate for transplant root loss.

E. Planting soil around roots or balls shall be thoroughly compacted and watered. After planting, the soil in the shrub beds shall be cultivated between shrubs, raked smooth,

and neatly outlined. Muddy soil shall not be used for backfilling. All broken or frayed roots shall be properly cut off.

F. Trees and shrubs on slopes steeper than 6 to 1 shall be provided with watering dams or berms.

G. All trees shall be thoroughly watered immediately after planting.

3.10 STAKING AND GUYING

A. Staking of trees shall be done immediately after they are planted. Plants shall stand plumb after staking.

3.11 PRUNING AND MULCHING

A. Each tree and shrub shall be pruned in accordance with standard horticultural practice to preserve the natural character of the plant in the manner fitting its use in the landscape design, as approved by the Owner.

B. All dead wood or suckers and all broken or badly bruised branches shall be removed by thinning out and shortening branches. Deciduous bare-rooted plants shall have not less than 1/3 of their respective leaf surfaces removed. All cuts shall be made just above a healthy bud. Pruning shall be done with clean, sharp tools.

C. Plants shall be mulched after planting and cultivating have been completed. A layer of mulch materials shall be spread on the finished landscaping grade within all planting areas to a depth of 4 inches. The mulch around isolated plants shall be 6 inches greater in diameter than the planting hole. All shrub and ground cover beds shall be completely covered with the mulch.

3.12 HYDROSEEDING

A. Area to be hydroseeded shall be thoroughly saturated prior to hydroseeding and allowed to dry to provide residual moisture in the top 1/4 inch of the surface.

B. Hydroseed shall be placed in accordance with the supplier's or manufacturer's recommendations.

C. Spray the area with a visible uniform coat, leaving no bare patches.

D. Hydroseed slurry shall not be allowed to be in the machine for more than two hours or shorter as recommended by the supplier or manufacturer. Any hydroseed slurry allowed to be stored for longer than specified will not be considered adequate for hydroseeding and shall be removed from the Site and disposed or amended in accordance with the recommendations of the supplier or manufacturer. Such amendment can include the addition of a minimum of 50% more seed mix.

3.13 TURF REINFORCEMENT MAT

A. TRM shall be installed along all fill slopes and areas where the Contractor has disturbed the ground surface or natural vegetation.

B. All areas to receive TRM shall be hydroseeded.

C. Where TRM is installed, it shall be installed beginning from the top of the slope behind the edge of asphalt pad and be continuous to the bottom most area of the disturbed area. TRM may taper at the bottom to conform to the bottom disturbed area, but shall not narrow at any point between the top and the taper at the bottom.

D. Install TRM in accordance with the TRM manufacturer's recommendations including placement and spacing of anchors and twist pins.

E. Top of TRM shall be secured within a shallow anchor trench in accordance with the trench requirements by the TRM manufacturer.

3.14 IRRIGATION

A. At the Contractor's option and own expense, to establish hydroseeded vegetation and other vegetation to be established and/or maintained by the Contractor, a temporary irrigation system may be installed.

B. Water for the temporary irrigation system may be obtained from an existing small outlet on the above ground pump discharge piping. Exact location to be determined by the Owner.

C. Adequacy of connection and water pressure is not guaranteed by the Owner. Contractor shall perform his/her own investigations to determine the adequacy for his/her needs.

D. Design of the temporary irrigation system shall be the responsibility of the Contractor. System shall use water efficiently and waste or overwatering shall not be allowed.

E. Contractor shall make the necessary connection while maintaining the functionality of the outlet connected equipment and install a threaded ball valve of appropriate size at the connection point.

F. Contractor shall install appropriate backflow prevention valves to protect potable water connection.

G. Cutting or modifying the existing fencing or other facility appurtenance to accommodate temporary irrigation shall not be allowed unless approved in writing by the Owner.

H. Contractor shall maintain temporary irrigation system in good working order and immediately repair any leaks which may occur.

I. Following the Contractor's use of the temporary irrigation, it shall be uninstalled and completely removed from the site. Connecting ball valve shall remain and a threaded plug installed to protect the end.

J. Normal use of water shall be provided by the Owner at no charge to the Contractor. Cost of water not used for design irrigation may be charged to the Contractor at the Owner's current charge rate.

K. No Owner provided electricity will be available for the temporary irrigation system.

3.15 MISCELLANEOUS ITEMS

A. Watering in existing irrigated areas shall be continued by the existing irrigation system. Contractor shall adjust, repair, or replace irrigation system components as required to ensure proper irrigation of new plants.

B. The Owner will inspect all work for acceptance upon receipt of the Contractor's Certificate of Completion.

C. All plants shall be guaranteed for not less than 2 full years from Statement of Acceptance.

1. During this period, any plant that is missing, dead, or not in satisfactory growth, as determined by the Owner, shall be replaced by the Contractor.

2. All replacements shall be plants of the same kind and size. They shall be furnished and planted as specified herein. The cost of replacement shall be borne by the Contractor except where it can be definitely shown that loss resulted from vandalism or the property owner's failure to maintain planting as instructed.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 02960

ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing all labor, materials and equipment and perform all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Section, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents that adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires consideration of air, water and land and involves management of noise and solid waste, as well as other pollutants.

C. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

1.02 APPLICABLE REGULATIONS

A. Comply with all applicable federal, state and local laws and regulations concerning environmental pollution control and abatement.

1.03 NOTIFICATIONS

A. The Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements may notify the Contractor in writing, through the Owner, of any non-compliance with state or local requirements. After receipt of such notice from the Owner or from the regulatory agency through the Owner, the Contractor shall immediately take corrective action. Such notice, when delivered to the Contractor or his/her authorized representative at the Site, shall be deemed sufficient for the purpose.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PROTECTION OF STREAMS

A. Do not discharge waters from dewatering operations directly or indirectly into any live or intermittent stream, channel, wetlands, surface water or any storm drain.

3.02 PROTECTION OF LAND RESOURCES

A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, matching that prior to construction and not detracting from the appearance of the project area. Confine all construction activities to areas shown on the Drawings.

B. Outside of areas requiring earthwork for the construction of the new facilities, do not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Owner. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.

D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Owner will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and replaced.

1. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1-inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Owner shall be immediately removed and replaced.

3.03 PROTECTION OF AIR QUALITY

A. Burning - The use of burning at the Site for the disposal of refuse and debris will not be permitted.

B. The Contractor shall comply with the requirements of the Ventura County APCD Rule 50 (Opacity), 51 (Nuisance), and 55 (Fugitive Dust).

C. Removal of vegetation and ground disturbance shall be limited to the minimum area necessary to complete the Work.

D. Regular ground wetting of exposed soils and sediments and unpaved access roads shall be conducted during construction to control fugitive dust emissions.

E. Grading activities shall cease during periods of high winds (greater than 20 miles per hour, averaged over 1 hour).

F. Silt containing material excavated, stockpiled or transported during construction shall be wetted regularly

G. On-site construction vehicle speed shall be limited to 15 miles per hour in unpaved areas.

H. Trucks transporting backfill material to or from the Site shall be covered or maintain a minimum two-foot freeboard.

I. Roadways in the vicinity of construction access points shall be swept as necessary to prevent accumulation of silt.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 02990

MISCELLANEOUS WORK AND CLEANUP

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and perform the miscellaneous work not specified in other sections but necessary for the proper completion of the Work as shown on the Drawings.

B. When applicable, perform the Work in accordance with other related Sections. When no applicable specification exists, perform the Work in accordance with the best modern practice and/or as directed by the Owner.

C. The work of this Section includes, but is not limited to, the following:

1. Crossing and relocating existing utilities
2. Restoring driveways and sidewalks
3. Cleaning up
4. Incidental work
5. Job photographs and video recordings
6. Protection and/or removal and reinstallation of signs, lampposts and mailboxes
7. Restoration and replacement of curbing
8. Protection and bracing of utility poles
9. Restoring rights-of-way
10. Temporary facilities
11. Restoring irrigation pipes and appurtenances

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials required for this Section shall be the same quality of materials that are to be restored. Where feasible and as approved by the Owner or agency having jurisdiction, reuse existing materials that are removed.

PART 3 - EXECUTION

3.01 CROSSING AND RELOCATING EXISTING UTILITIES

A. Perform work required in crossing culverts, watercourses, including brooks, drainage ditches, and storm drains, gas mains, water mains, and electric, telephone, gas and water services and other utilities. This work shall include bracing, hand excavation, backfill and any other work required for crossing the utility or obstruction. Contractor shall notify utility owners a minimum of 4 weeks in advance of any work that may affect a utility.

B. Locate and pothole existing utilities that may interfere with construction and provide Owner with a potholing report at least 2 weeks prior to the acquisition of pipe materials. The pothole report shall include the following:

1. Owner's name
2. Type (water, sewer, electrical, etc.)
3. Size
4. Material (PVC, steel, concrete, etc.)
5. Elevation of top center of utility
6. Elevation of finished surface at top center of utility
7. Calculated depth to outside top and bottom of utility
8. Coordinate location of top center of utility where potholed
9. Pipeline crossing station/location
10. Determination of utility will interfere with pipeline alignment and require a change in pipeline alignment.

C. Contractor shall notify in writing all utility companies 30 Calendar Days in advance of construction of potential crossing or conflict with construction. Owner shall be provided an opportunity to review and comment on the notification 2 Working Days in advance and shall be copied on the notification issued to the utility company.

D. In locations where existing utilities cannot be crossed without interfering with the construction of the Work as shown on the Drawings, remove and relocate the utility as directed by the Owner or cooperate with the utility companies concerned if they relocate their own utility.

E. Fully support all exposed utilities during crossings adequately so as not to allow supported utility to bend, sag, or otherwise endanger the utility.

3.02 RESTORING DRIVEWAYS AND SIDEWALKS

A. Existing public and private driveways disturbed by the construction shall be replaced at the Contractor's expense. Paved drives shall be repaved to the limits and thicknesses existing prior to construction. Gravel drives shall be replaced and regraded in kind.

B. Existing public and private sidewalks disturbed by the construction shall be replaced with sidewalks of equal quality and dimension at the Contractor's expense.

3.03 RESTORING IRRIGATION PIPES AND APPURTENANCES

A. Irrigation pipes, heads, valves, boxes, and other such appurtenances damaged or removed during construction shall be restored or repaired to equal or better to the satisfaction of the agency having jurisdiction.

B. Upon completion of restoration work, all pipes, valves, heads, and other such irrigation transmission component shall be flushed and cleared of all debris that may inhibit the operation of the irrigation system. Flushing and clearing shall be for all irrigation components within the entire irrigation zone affected, regardless if some irrigation components were not directly involved in the construction.

C. Contractor shall monitor the operation of irrigation system for a period of 30 Calendar Days following complete demobilization from all irrigated areas. Should any irrigation component clog or foul within 30 Calendar Days, the Contractor shall be responsible for that component's replacement and reflush of irrigation zone as described in Paragraph 3.03.B of this Section.

3.04 CLEANING UP

A. Remove all construction material, excess excavation, buildings, equipment and other debris remaining on the Site as a result of construction operations and restore the Site to a neat and orderly condition.

3.05 INCIDENTAL WORK

A. Do all incidental work not otherwise specified, but necessary to the proper completion of the Work as specified in the Contract Documents.

3.06 VIDEO RECORDING OF PROJECT

A. Prior to the Contractor placing any equipment or materials on the Site or beginning any construction activities, including potholing, the Contractor shall document existing conditions of the Site, including length of pipeline alignment, using color motion video.

B. The video shall be in color with a date and time stamp in the video. Prior to submittal, the video shall be transferred to DVD(s) in the MPEG or MPA digital file format, with a video rate not less than 128 kbps and formatted for use with the Microsoft Windows operating system.

C. All video shall be adequate in visual detail and resolution to show the color, type and extent of all items being documented. Upon submittal, if the Owner, in the Owner's own opinion, determines that the extent or detail of the video are inadequate, the Contractor shall correct the deficiencies and resubmit the required copies to the Owner at no additional cost to the Owner.

D. Videos shall document all existing features that may be affected by construction activities. At a minimum, the following shall be documented prior to the start of construction:

1. Surrounding vegetation including windrows, decorative trees and bushes and agricultural crops.

2. Areas to be used as staging or storage.

3. Along work areas and adjacent areas.

4. Surface drainage structures and channels where construction will cross over, under or within 10 feet of excavation including headwalls, wingwalls, interior walls, roof, floor, etc.

5. Any facility whose condition is damaged, deteriorated or otherwise not in good condition.

6. Fences, rails, irrigation, walls, structures, utility boxes, mailboxes, utility poles, control boxes, light standards, signs, and any other such surface and utility appurtenances.

7. Condition of reinforced concrete boxes, internal and visible external components.

8. Paved and unpaved driveways near construction.

9. Drainage ditches, including condition of sidesloped areas.

10. Areas where project facilities will be constructed.

11. All existing surface facilities that will have to be removed and replaced as a result of construction activities.

12. Outside of all buildings within 200' of construction area to the extent that they can be filmed from public right-of-way.

E. Record the individual features of each item with particular attention being focused upon the existence of any existing faults, fractures, or defects.

F. Control pan rate, rate of travel, camera height, and zoom rate to maintain a steady clear view.

G. Limit recorded coverage to one side of any street at any one time.

H. Create a single, continuous, unedited recording that begins and ends within each portion of a particular construction area. The recording shall proceed in the direction of ascending baseline stationing.

I. Audio Content

1. Simultaneously record audio content during videotaping.

2. Audio recording shall assist in viewer orientation and in any needed identification, clarification, or description of features being recorded.

3. Audio recording shall only consist of camera operator commentary,

J. The Contractor shall submit to the Owner one copy of DVD(s) of the Site.

K. The Contractor shall maintain an identical set of DVD(s) at the Site in a secure location throughout the duration of the Work.

3.07 PROJECT PHOTOS

A. Prior to the Contractor placing any equipment or materials on the Site or beginning any construction activities, including potholing, the Contractor shall document existing conditions of the Site, including length of pipeline alignment, using digital still photography.

B. All digital photos shall be taken with a 10 megapixel minimum digital camera, in color, and with a date and time stamp on each photo. Digital photos shall be in JPEG format and shall be transferred to CD(s) or DVD(s) formatted for use with the Microsoft Windows operating system.

C. All photos shall be adequate in visual detail and resolution to show the color, type and extent of all items being documented. Upon submittal, if the Owner, in the Owner's own opinion, determines whether the extent or detail of the digital photos are inadequate, the Contractor shall correct the deficiencies and resubmit the required copies to the Owner at no additional cost to the Owner.

D. Digital photos shall document all existing features that may be affected by construction activities. At a minimum, the following shall be documented prior to the start of construction:

1. Surrounding vegetation, including windrows, decorative trees and bushes and agricultural crops.

2. Areas to be used as staging or storage.

3. Along project area and adjacent areas, including full width of permanent and temporary easements.

4. Any facility whose condition is damaged, deteriorated or otherwise not in good condition.

5. Fences, rails, irrigation, walls, structures, utility boxes, mailboxes, utility poles, control boxes, light standards, signs, and any other such surface and utility appurtenances.

6. Condition of reinforced concrete boxes, internal and visible external components.

7. Paved and unpaved driveways near construction.

8. Drainage ditches, including condition of sidesloped areas.

9. Surface drainage structures and channels where construction will cross over, under or within 10 feet of excavation including headwalls, wingwalls, interior walls, roof, floor, etc. Existing cracks or defects shall have a measuring tape or other reliable measuring device held against in each photo to determine the extent, width, and offset, if any.

10. Areas where project facilities will be constructed.

11. All existing surface facilities that will have to be removed and replaced as a result of construction activities.

12. Outside of all buildings within 200' of the construction area to the extent that they can be filmed from public right-of-way.

E. Take digital pictures of individual features of each item with particular attention being focused upon the existence of any existing faults, fractures, or defects.

F. Digital pictures shall be focused, framed, and zoomed in such that the location of the picture being taken can be determined with certainty.

3.08 REMOVAL AND REPLACEMENT OF SIGNS, LAMPPOSTS AND MAILBOXES

A. Existing signs, lampposts and mailboxes that may be damaged or removed during the course of installing the new pipelines or other facilities shall be promptly reinstalled in a vertical position at the same location from which they were removed. Replace damaged items with items of equal or better quality than the damaged items. Provide a concrete anchor as necessary to ensure a rigid alignment. Exercise care in the reinstallation of all items to prevent damage to the newly installed pipelines.

3.09 RESTORATION AND REPLACEMENT OF CURBING

A. Existing concrete or bituminous curbing shall be protected. If necessary, curbing shall be removed and replaced after backfilling. Curbing which is damaged during construction, including damage due to formation of voids or settlement behind shoring, shall be replaced with curbing of equal quality and dimension. Joints between sections shall be pointed as required after resetting. Bituminous berms shall conform to governing agency standards and requirements.

3.10 COOPERATION WITH OTHER CONTRACTORS AND CONNECTION TO WORK BY OTHERS

A. Construction on other contracts may be carried on during the same period as construction under this Contract. It will be necessary for the Contractor to plan his/her work and cooperate with other contractors to prevent any interference and delay for which he/she shall receive no other compensation than that agreed upon for the Work.

3.11 PROTECTION AND BRACING OF UTILITY POLES

A. Make all arrangements with the proper utility companies for bracing and protection of all utility poles that may be damaged or endangered by the operations. Work under this item shall include the related removal and reinstallation of guy wires, or support poles whether shown on the Drawings or not.

3.12 RESTORING RIGHTS-OF-WAY

A. The Contractor shall be responsible for all damage to public and private property due to his operations. Protect from injury all walls, fences, cultivated shrubbery and vegetables, trees, pavement, underground facilities, such as water, gas and electrical lines, or other utilities that may be encountered during the course of work. If removal and replacement are required, it shall be done in a workmanlike manner so that replacement is equivalent to that which existed prior to construction.

3.13 TEMPORARY FACILITIES

A. Furnish, install, maintain and remove all temporary facilities required for construction.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 03300

CONCRETE WORK

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work covered by this section of the Specifications consist in furnishing all plant, labor, equipment and materials required and in performing all operations in connection with all Portland cement concrete work necessary to complete the Work.

1.02 RELATED WORK

A. Grout is included in Section 03600.

1.03 SUBMITTALS

A. Submit to the Engineer, in accordance with Section 01300, shop drawings and product data showing materials of construction, test reports and details of installation for concrete work, including the following:

1. Reinforcing drawings showing reinforcement material, grade and applicable ASTM standards, bar lists, schedule, bending details, placing plans, elevations and details, concrete cover, splice locations, splice lengths, and additional reinforcement around openings, at corners, etc.

2. Sources of cement, pozzolan, and aggregates. Material Safety Data Sheets (MSDS) for all concrete components and admixtures.

3. Certification from qualified laboratory for each type of aggregate from the proposed source in accordance with ASTM C1077, confirming that the aggregates are innocuous/non-reactive. Certified ASTM C289 test results acquired within six months from the submittal date for potential reactivity of aggregates shall be included.

4. Complete concrete mix design details, including compressive strength, slump, air content, admixtures, constituent quantities per cubic yard, water-cementitious materials ratio, type of cement, and contact information for ready mix concrete supplier.

5. Product data, including catalog cuts, technical data and conformity to ASTM standards for form release agent, form ties, sheet curing material, liquid curing compound, epoxy and joint sealant.

6. Certified delivery tickets for ready-mix concrete at the time of delivery of each load of concrete.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM A82 - Specification for Steel Wire, Plain, for Concrete Reinforcement
2. ASTM A185 - Standard Specification for Welded Steel Wire Fabric for Concrete Reinforcement
3. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
4. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement
5. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field
6. ASTM C33 - Standard Specification for Concrete Aggregates
7. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
8. ASTM C94 - Standard Specification for Ready-Mixed Concrete
9. ASTM C127 - Coarse Aggregate
10. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
11. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete
12. ASTM C150 - Standard Specification for Portland Cement
13. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete
14. ASTM C289 - Reactive Aggregate Test
15. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
16. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete

B. American Concrete Institute (ACI)

1. ACI 117 - Standard Tolerances for Concrete Construction and Materials
2. ACI 301 - Specifications for Structural Concrete
3. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete
4. ACI 304.2R - Placing Concrete by Pumping Methods
5. ACI 305R - Hot Weather Concreting
6. ACI 306R - Cold Weather Concreting
7. ACI 315 - Details and Detailing of Concrete Reinforcement
8. ACI 318 - Building Code Requirements for Reinforced Concrete
9. ACI SP-66 - ACI Detailing Manual

C. Concrete Reinforcing Steel Institute (CRSI)

1. Manual of Standard Practice

D. American Plywood Association (APA)

1. Material grades and designations as specified.

1.05 QUALITY ASSURANCE

A. Reinforced concrete shall comply with ACI 318 and other stated requirements, codes and standards.

B. Field testing and inspection services will be provided by the Owner. The cost of such work, except as specifically stated otherwise, shall be paid by the Owner. Testing of the following items may be performed by the Owner to verify conformity with this Specification Section:

1. Concrete placements - compressive strength (cylinders), compressive strength (cores), and slump.
2. Other materials or products that may come under question.

1.06 DELIVERY, STORAGE AND HANDLING

A. Sheet Curing Materials: Store in weathertight buildings or off the ground and under cover.

B. Liquid Curing Compounds: Store in closed containers.

C. Reinforcing steel shall be substantially free from mill scale, rust, dirt, grease, or other injurious contaminants and stored off the ground.

D. Reinforcing steel shall be shipped and stored with bars of the same size and shape fastened in bundles with durable tags, marked in a legible manner with waterproof markings showing the same "mark" designations as those shown on the submitted placing drawings.

PART 2 - PRODUCTS

2.01 GENERAL

A. The use of manufacturer's name and model or catalog number is for establishing the standard of quality and general configuration desired. Like items of materials shall be the products of one manufacturer in order to provide standardization for appearance, maintenance and manufacturer's service.

B. Materials shall be new and shall comply with this Section and any applicable state or local requirements.

2.02 MATERIALS

A. Cement: Domestic Portland cement complying with ASTM C150. Air entraining cements shall not be used. The following cement type(s) shall be used:

1. All classes of concrete - Type II/V with all optional characteristics (with low-alkali and moderate heat of hydration) specified in Table 2 of ASTM C150.

B. Fine Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33.

C. Coarse Aggregate: Well-graded crushed stone or washed gravel conforming to the requirements of ASTM C33 Table 2. Size numbers for the concrete mixes shall be as shown in Table 1 herein.

D. Water: Water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.

E. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When it is required to use more than one admixture in a concrete

mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix including other admixtures.

1. Air-Entraining Admixture: The admixture shall comply with ASTM C260. Proportioning and mixing shall be in accordance with manufacturer's recommendations.

2. Water-Reducing Agent: The admixture shall comply with ASTM C494, Type A. Proportioning and mixing shall be in accordance with manufacturer's recommendations.

3. High-Range Water-Reducer (Plasticizer): Plasticizer shall not be used unless approved by the Engineer.

F. Pozzolan (Fly Ash). Pozzolan shall be Class C or Class F fly ash complying with ASTM C618 except the Loss on Ignition (LOI) shall be limited to 3 percent maximum.

G. Sheet Curing Materials. Waterproof paper, polyethylene film or white burlap-polyethylene sheeting all complying with ASTM C171.

H. Liquid Curing Compound. Liquid membrane-forming curing compound shall comply with the requirements of ASTM C309, Type 1-D (clear or translucent with fugitive dye) and shall contain no wax, paraffin, or oil.

I. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material.

J. Form Release Agent

1. Coat all forming surfaces in contact with concrete that will not be painted using an effective, non-staining, non-residual, water based, bond-breaking form coating, unless otherwise noted.

K. Deformed Concrete Reinforcing Bars: ASTM A706, grade 60 deformed bars. ASTM A615 Grade 60 may be used provided the following requirements are satisfied:

1. The actual yield strength of the reinforcing steel based on mill tests shall not exceed the specified yield strength by more than 18,000 psi. Re-tests shall not exceed this value by more than an additional 3,000 psi.

2. The ratio of the actual ultimate tensile strength to the actual tensile yield strength of the reinforcement shall not be less than 1.25.

3. The carbon equivalency (CE) of ASTM A615 bars shall be 0.55 or less.

L. Concrete Reinforcing Bars required on the Drawings to be field bent or welded shall be conforming to ASTM A706.

M. Tie Wire

1. Tie Wires for Reinforcement shall be 14-gauge or heavier, black annealed wire.

N. Welded Steel Wire fabric reinforcement shall conform to the requirements of ASTM A185.

O. Bond breaker tape shall be nonstaining type bond prevention coating such as Williams Tilt-up Compound by Williams Distributors Inc.; Silcoseal 77, by SCA Construction Supply Division, Superior Concrete Accessories; Super Bond Breaker WB by Burke Co., San Mateo, CA; or equal.

P. Epoxy bonding agent shall be a two-component, solvent-free, moisture insensitive, epoxy resin material conforming to ASTM C881, Type V. The bonding agent shall be Sikadur 32 Hi-Mod by Sika Corporation of Lyndhurst, NJ; Concresive Liquid (LPL) by Master Builders of Cleveland, OH; or equal.

Q. Joint sealant shall be polyurethane polymer designed for bonding to concrete which is continuously submerged in water. Sealants shall be Permapol RC-270 by Product Research & Chemical Corp.; Elastothane 227R by Pacific Polymers; PS1-270 by Polymer Systems, Inc. or Sikaflex by Sika Corporation.

2.03 CONCRETE MIXES

A. General:

1. Concrete shall be composed of Portland cement, fine and coarse aggregates, water and admixtures. These materials shall be of the qualities specified herein. Fly ash may be included in the mix up to 15% the volume of cement.

2. In general, the mix shall be designed to produce a concrete capable of being deposited to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface.

3. All concrete shall be ready-mixed concrete complying with ASTM C94 except as otherwise permitted by the Engineer.

B. Concrete Mix Requirements:

1. Select proportions of ingredients that meet the design strength and material limits specified in Table 1 to produce concrete having proper consistency, durability, strength, appearance and other required properties. Proportion ingredients to produce a homogenous mixture that will readily work into corners, angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.

2. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if not available, be developed by laboratory tests. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

Table 1 - Concrete Mix Requirements

	Class B	Class D
Design Strength (1)	3,000	4,000
Cement (2)	C150 Type II with all optional characteristics as specified in Table 2 of ASTM C150	C150 Type II with all optional characteristics as specified in Table 2 of ASTM C150
Fine Aggregate (2)	C33	C33
Coarse Aggregate (3)	57 1 in. to 4 no.	57 1 in. to 4 no.
Cementitious Content (4)	495 min.	611 min.
W/C Ratio (5)	0.54 max.	0.44 max.
Fly Ash	---	15% if Used
AE Range (6)	3.5 to 5 if used	3.5 to 5 if used
WR (7)	May be Used	May be Used
Slump Range Inches (8)	1 - 3	2 - 4

NOTES:
(1) Minimum compressive strength in psi at 28 Calendar Days
(2) ASTM designation
(3) Size Number in ASTM C33
(4) Cementitious content in lbs/cu yd
(5) W/C is Water-Cementitious ratio by weight
(6) AE is percent air-entrainment
(7) WR is water-reducer admixture
(8) Slump values listed are for concrete mixes without WR admixture. Maximum slump shall not be more than 5 inches for concrete with WR admixture.

PART 3 - EXECUTION

3.01 FORMWORK

A. Forms shall be surfaced, designed and constructed in accordance with the recommendations of ACI 347 and shall meet the additional requirements as specified herein.

B. Forms shall be used for all cast-in-place concrete including sides of footings except for pipe and conduit encasements where concrete may be placed directly against the side of the trench.

C. The Contractor shall be solely responsible for the adequacy of the forming system. Concrete forms shall conform to the shape, lines, and dimensions of members as called for on the Drawings. Forms shall be substantial, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly placed concrete.

D. Provide openings in concrete formwork shown on Drawings or required by other Sections. Pipe embedment and metal items used to support pipe penetrations shall have a minimum clearance of 2 inches from reinforcing steel bars.

E. Form Ties. Holes left by the removal of form tie cones shall be reamed with suitable toothed reamers to leave the surface of the holes clean and rough before being filled with mortar.

3.02 REINFORCEMENT

A. All reinforcement steel, welded wire fabric, couplers, and other appurtenances shall be fabricated and placed in accordance with the requirements of the applicable codes and the supplementary requirements specified herein. Surface condition, bending, spacing and tolerances of placement of reinforcement shall comply with the CRSI Manual of Standard Practice.

B. Reinforcement steel shall be accurately formed to the dimensions and shapes shown, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318 except as indicated. Bars shall be bent cold. Reinforcing steel bars shall not be field bent or welded except where shown on the Drawings or specifically authorized in writing by the Engineer.

C. Reinforcing steel bars shall be fabricated such as to avoid interference with the items to be embedded in the concrete, such as, pipes, sleeves, hatch frames, etc. Shop Drawings shall include additional details, as required, depicting special fabrication requirements to avoid interference with items to be embedded.

D. Reinforcement steel shall be tied using annealed iron wire ties or suitable clips at intersections. For concrete over formwork, the Contractor shall furnish concrete, metal, plastic, or other acceptable bar chairs and spacers as per following:

1. Concrete Dobies: Permitted at all locations except where architectural finish is required.

2. Wire Bar Supports: Permitted only at slabs over dry areas, interior dry wall surfaces, and exterior wall surfaces.

3. Plastic Bar Supports: Permitted at all locations except on grade.

E. Unless otherwise specified, reinforcement placing tolerances shall be within the limits specified in Section 7.5 of ACI 318.

F. Reinforcing interrupted by openings shall be grouped at each side of openings unless otherwise shown. Reinforcing terminated at the openings shall be hooked 90 degrees.

G. Welded wire fabric placed over the ground shall be supported on wired concrete blocks (dobies) spaced not more than 3 feet on centers in any direction. The construction practice of placing welded wire fabric on the ground and hooking into place in the freshly placed concrete shall not be used.

H. Except as otherwise indicated on the Drawings, the minimum concrete cover of reinforcement shall be as follows:

1. Concrete cast against earth: 3 inches

2. Concrete exposed to soil, water, sewage, sludge and/or weather (cover to be measured from deepest part of architectural reveals):

   a. No. 6 bars and larger: 2 inches

   b. No. 5 bars and smaller: 1 1/2 inches

3. Concrete not exposed to soil, water, sewage, sludge and/or weather:

   a. Slabs (top and bottom cover), walls, joists, shells and folded plate members: 1 inch

I. Spacing of bars shall be as shown on Drawings.

J. Splices of Reinforcement:

1. Reinforcement bar splices shall only be used at locations indicated. When it is necessary to splice reinforcement at points other than where shown, the character of the splice shall be as acceptable to the Owner.

2. The length of lap for reinforcement bars, unless otherwise indicated, shall be in accordance with ACI 318. Splices in adjacent bars shall be staggered. Splices in two curtains where used shall not occur in the same location. Class A splices may be used when 50 percent or less of the bars are spliced within the required lap length. Class B splices shall be used at all other locations.

3. Laps of welded wire fabric shall be in accordance with the ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

3.03 CONCRETE

A. The following (Table 2) are the general applications for the various concrete classes and design strengths and shall be used as a minimum unless otherwise indicated.

Table 2 - Concrete Schedule		
Class	Design Strength (psi)	Description
B	3,000	All unreinforced concrete components, including concrete overlay, concrete fill, ditches, pavements, curbs, gutters, fence post foundations, flatwork, small pads & duct encasement
D	4,000	All reinforced concrete components, including walls, slabs on grade, building floor slab, suspended slab systems, beams, columns, footings, ring beams, vaults and all other structural components

B. Concrete shall be ready-mixed concrete produced by industry-accepted equipment. No hand mixing will be permitted. Ready-mix concrete shall be transported to the Site in watertight agitator or mixer trucks.

C. Retempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

D. Furnish a delivery ticket for ready-mixed concrete to the Owner as each truck arrives. Each ticket shall provide a detailed printed record including names of concrete supplier and purchaser, job location, date of delivery, truck number, amount of concrete, type and weight of cement, weight of coarse and fine aggregate, weight of water in the mix, weight/gallons of water permitted to be added on the Site, time of concrete loaded and time of discharge from the truck.

E. The maximum time interval between the addition of mixing water and/or cement to the batch and the placing of concrete in the forms shall not exceed the values shown in Table 3.

Table 3 - Maximum Time to Discharge of Concrete	
Air or Concrete Temperature (whichever is higher)	Maximum Time
80 to 90 Degrees F (27 to 32 Degrees C)	45 minutes
70 to 79 Degrees F (21 to 26 Degrees C)	60 minutes
40 to 69 Degrees F (5 to 20 Degrees C)	90 minutes

F. Prior to placing of any concrete on earth surface, such surface shall be thoroughly wetted and kept moist by frequent sprinkling until concrete is placed. The surface shall be firm and free from any debris, mud or standing water at the time of placing concrete. Confirm that reinforcement and other embedded items are securely in place.

G. Dowels, pipes, waterstops, and other installed materials and accessories shall be held securely in position while concrete is being placed.

H. Provide construction joints as shown on the Drawings. Surfaces of vertical joints shall be wire brushed and then washed clean. Surfaces of horizontal construction joints shall be cleaned of all laitance, roughened by sandblasting and then washed clean. At least 2 hours before and again shortly before the new concrete is deposited, the joints shall be saturated with water.

I. Deposit concrete as near its final position as possible to avoid segregation. Place concrete continuously at a rate that ensures the concrete is being integrated with fresh plastic concrete. Place concrete in forms using tremie tubes and taking care to prevent segregation. Bottom of tremie tubes shall preferably be in contact with the concrete already placed. Do not permit concrete to drop freely more than 4 feet.

J. All concrete shall be consolidated using mechanical vibrators, puddling, spading, rodding or forking so that concrete is thoroughly worked around reinforcement, embedded items and openings and into corners of forms. Do not over vibrate so as to segregate concrete.

K. Concrete placed during cold weather shall be batched, delivered, placed, cured and protected in compliance with the recommendations of ACI 306R. No concrete shall be mixed, placed or cured while the atmospheric temperature is below 40° F unless adequate means satisfactory to the Owner are employed for heating the concrete ingredients and protecting placed concrete during curing period. All concrete placed in forms shall have a temperature 50° F or higher after placement.

L. Concrete placed during hot weather shall be batched, delivered, placed, cured and protected in compliance with the recommendations of ACI 305R. Temperature of concrete being placed shall not exceed 90° F and every effort shall be made to maintain a uniform concrete mix temperature below this level.

M. Curing Methods for Concrete Surfaces: Cure concrete after placement using one of the following methods:

1. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling or covered with saturated burlap for 10 Calendar Days minimum. Burlaps shall be kept damp throughout the curing period. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.

2. Liquid Membrane Curing: Apply curing compound over the entire concrete surface except for surfaces to receive additional concrete. Curing compound shall be applied

as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application of curing compound shall comply with the manufacturer's recommendations. Slabs larger than 100 square feet shall be covered with sheet material after application of the curing compound. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Add water under the curing sheets as necessary to maintain damp concrete surfaces. Sheeting shall be kept in place for a minimum 10 Calendar Days.

N. Except as otherwise specifically authorized by the Engineer in writing, forms shall not be removed before the concrete has attained strength of at least 30 percent of its specified design strength.

O. All exposed corners of concrete shall have 3/4 inch chamfer, unless noted otherwise.

P. Construction joints shall not be placed at locations other than those shown on the Drawings without the prior written approval of the Engineer.

3.04 CONCRETE FINISH

A. All concrete surfaces shall conform accurately to shape, alignment, and grade shown on the Drawings. Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing or roughness of any kind and shall present a finished, smooth and continuous hard surface.

B. Repair holes left by tie rod cones and small imperfections as per Paragraph 3.06.C.

C. Horizontal concrete surfaces of slabs shall have machine or hand floated finish.

D. Provide broom finish perpendicular to direction of traffic for concrete walkways and stairs.

3.05 FIELD INSPECTION AND TESTING

A. In no case shall any reinforcing steel be covered with concrete until the installation of the reinforcement, including the size, spacing and position of the reinforcement, has been observed by the Owner. The Owner shall be given a minimum of 24 hours (one Working Day) prior notice of the readiness of placed reinforcement for observation. The forms shall be kept open until the Owner has finished observations of the reinforcing steel.

B. The Owner shall be notified when the forms are complete and ready for inspection at least 24 hours (One Working Day) prior to the proposed concrete placement.

C. The batching, mixing, transporting, placing and curing of concrete shall be subject to the inspection by the Owner at all times.

D. Sets of field control cylinder specimens may be taken by the Owner during the progress of the Work, in compliance with ASTM C31.

1. A "set" of test cylinders consists of four cylinders: one to be tested at 7 Calendar Days and two to be tested and their strengths averaged at 28 Calendar Days. The fourth cylinder may be used for a special test at 3 Calendar Days or to verify strength after 28 Calendar Days if 28 Calendar Day test results are low.

E. Cooperate in the making of tests by allowing free access to the Work for the selection of samples, providing an insulated closed curing box for specimens, affording protection to the specimens against injury or loss through the operations and furnishing material and labor required for taking concrete cylinder samples. All shipping of specimens will be paid for by the Owner. Curing boxes shall be acceptable to the Owner.

F. Slump tests will be made in field immediately prior to placing the concrete in accordance with ASTM C143. If slump is greater than the specified range, the concrete shall be rejected.

3.06 CARE, PATCHING AND REPAIRS

A. It is the intent of this Section to require quality work including adequate forming, proper mixture and placement of concrete and curing so completed concrete surfaces will require no patching. Patching and repair work for holes and honeycombed areas shall be performed as specified herein. Any other modifications or repair work required for defective concrete shall be performed as approved by the Engineer.

B. The Contractor shall protect all concrete from damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance. Any concrete found to be damaged or which may have been originally defective or becomes defective prior to final acceptance of the Work or which departs from line or grade or which for any other reason does not conform to these Specifications shall be satisfactorily repaired or removed and replaced by the Contractor at his expense.

C. Immediately after removal of forms, remove plugs and break off metal ties. Promptly fill holes upon stripping as follows: Moisten the hole with water, followed by a 1/16-inch brush coat of neat cement slurry mixed to the consistency of a heavy paste. Immediately plug the hole with a 1 to 1.5 mixture of cement and concrete sand mixed slightly damp to the touch (just short of "balling"). Hammer the grout into the hole until dense, and an excess of paste appears on the surface in the form of a spider web. Trowel smooth with heavy pressure. Avoid burnishing.

D. Honeycombed areas as determined by the Owner shall be repaired, or completely removed and replaced as directed by the Owner. In no case will extensive patching of honeycombed concrete be permitted.

1. Remove honeycombed and defective concrete to sound concrete and 1-inch minimum depth. The sides of all removal and repair shall be square.

2. Patch small areas by applying an epoxy bonding agent and then packing the void with non-shrink grout. Finish flush with surrounding concrete.

3. If concrete removal results in cavities exceeding 3-inch in depth and 1 square foot in area, first apply an epoxy-bonding agent. Then pack the void with 5,000 psi concrete. Form surfaces as required to prevent sagging. Finish flush with the surrounding concrete.

END OF SECTION

TECHNICAL PROVISIONS

SECTION 03600

GROUT

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install grout complete as shown on the Drawings and as specified herein.

B. Perform all sampling and furnish all testing of materials and products by an independent testing laboratory acceptable to the Engineer but engaged by and at the expense of the Contractor.

1.02 RELATED WORK

A. Concrete Work is included in Section 03300.

B. Metal Fabrications are included in Section 05500

1.03 SUBMITTALS

A. Submit to the Engineer, in accordance with Section 01300, Shop Drawings and product data showing materials of construction and details of installation for:

1. Commercially manufactured nonshrink cementitious grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheets.

2. Commercially manufactured nonshrink epoxy grout. The submittal shall include catalog cuts, technical data, storage requirements, product life, working time after mixing, temperature considerations, conformity to required ASTM standards and Material Safety Data Sheets.

B. Samples

1. Samples of commercially manufactured grout products when requested by the Engineer or Owner.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts and Monolithic Surfacings

2. ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures

3. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

4. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics

B. U.S. Army Corps of Engineers Standard (USACE)

1. CRD-C 621 - Corps of Engineers Specification for Nonshrink Grout

1.05 QUALITY ASSURANCE

A. Qualifications

1. Grout manufacturer shall have a minimum of 10 years experience in the production and use of the type of grout proposed for the work.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Site in original, unopened packages, clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions.

B. Store materials in full compliance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to 12 months or the manufacturer's recommended storage time, whichever is less.

C. Material that becomes damp or otherwise unacceptable shall be immediately removed from the Site and replaced with acceptable material at no additional expense to the Owner.

D. Nonshrink cement-based grouts shall be delivered as preblended, prepackaged mixes requiring only the addition of water.

E. Nonshrink epoxy grouts shall be delivered as premeasured, prepackaged, three component systems requiring only blending as directed by the manufacturer.

1.07 DEFINITIONS

A. Nonshrink Grout: A commercially manufactured product that does not shrink in either the plastic or the hardened state, is dimensionally stable in the hardened state, and bonds to a clean base plate.

PART 2 - PRODUCTS

2.01 GENERAL

A. The use of a manufacturer's name and product or catalog number is for establishing the standard of quality required.

B. Like materials shall be the products of one manufacturer or supplier in order to provide standardization of appearance.

2.02 MATERIALS

A. Nonshrink Cementitious Grout (Nonshrink Grout)

1. Nonshrink grouts shall meet or exceed the requirements of ASTM C1107 Grades B or C and CRD-C 621. Grouts shall be Portland cement based, contain a pre-proportioned blend of selected aggregates and shrinkage compensating agents and shall require only the addition of water. Nonshrink grouts shall not contain expansive cement or metallic particles. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.

   a. General purpose nonshrink grout shall conform to the standards stated above and shall be SikaGrout 212 by Sika Corp.; Set Grout by Master Builders, Inc.; Gilco Construction Grout by Gifford Hill & Co.; Euco NS by The Euclid Chemical Co.; NBEC Grout by U. S. Grout Corp. or approved equivalent.

   b. Flowable (Precision) nonshrink grout shall conform to the standards stated above and shall be Masterflow 928 by Master Builders, Inc.; Hi-Flow Grout by the Euclid Chemical Co.; SikaGrout 212 by Sika Corp.; Supreme Grout by Gifford Hill & Co.; Five Star Grout by U. S. Grout Corp. or approved equivalent.

B. Nonshrink Epoxy Grout

1. Nonshrink epoxy-based grout shall be a pre-proportioned, three-component, 100 percent solids system consisting of epoxy resin, hardener, and blended aggregate. It shall have a compressive strength of 14,000 psi in 7 Calendar Days when tested in conformity with ASTM D695 and have a maximum thermal expansion of 30×10^{-6} when tested in conformity with ASTM C531. The grout shall be Ceilcote 648 CP by Master Builders, Inc.; Five Star Epoxy Grout by U.S. Grout Corp.; Sikadur 42 Grout-

Pak by Sika Corp.; High Strength Epoxy Grout by the Euclid Chemical Co. or approved equivalent.

PART 3 - EXECUTION

3.01 PREPARATION

A. Grout shall be placed over cured concrete that has attained its full design strength unless otherwise approved by the Engineer in writing.

B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints; and free of all loose material or foreign matter that may affect the bond or performance of the grout.

C. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.

1. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the air line to prevent oil from being blown onto the surface.

D. Remove all loose rust, oil or other deleterious substances from metal embedments or bottom of baseplates prior to the installation of the grout.

E. Concrete surfaces shall be washed clean and then kept moist for at least 24 hours prior to the placement of cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, flooding the surface, or other method acceptable to the Engineer. Upon completion of the 24-hour period, visible water shall be removed from the surface prior to grouting. The use of an adhesive bonding agent in lieu of surface saturation shall only be used when approved by the Engineer for each specific location of grout installation.

F. Epoxy-based grouts do not require the saturation of the concrete substrate. Surfaces in contact with epoxy grout shall be completely dry before grouting.

G. Construct grout forms or other leakproof containment as required. Forms shall be lined or coated with release agents recommended by the grout manufacturer. Forms shall be of adequate strength, securely anchored in place and shored to resist the forces imposed by the grout and its placement.

1. Forms for epoxy grout shall be designed to allow the formation of a hydraulic head and shall have chamfer strips built into forms.

H. Level and align the structural or equipment bearing plates in accordance with the structural requirements and the recommendations of the equipment manufacturer.

I. Equipment shall be supported during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by appropriate bond breaking coatings and removed after grouting unless otherwise approved by the Engineer.

3.02 INSTALLATION - GENERAL

A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and this Section.

B. Have sufficient manpower and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and nearby.

C. Maintain temperatures of the foundation plate, supporting concrete, and grout between 40 and 90 degrees F during grouting and for at least 24 hours thereafter or as recommended by the grout manufacturer, whichever is longer. Take precautions to minimize differential heating or cooling of baseplates and grout during the curing period.

D. Take special precautions for hot weather or cold weather grouting as recommended by the manufacturer when ambient temperatures and/or the temperature of the materials in contact with grout are outside of the 60 and 90 degrees F range.

E. Install grout in a manner that will preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of a control joint.

F. Reflect all existing underlying expansion, control and construction joints through the grout.

3.03 INSTALLATION - NONSHRINK GROUTS

A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior written approval by the Engineer.

B. Mix in a mortar mixer (with moving blades). Add pre-measured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.

C. Placements greater than 3 inches in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer and Engineer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.

D. Place grout into the designated areas in a manner that will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement shall

proceed in a manner that will ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.

E. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (retemper) after initial stiffening.

F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45-degree angle from the lower edge of bearing plate unless otherwise approved by the Engineer. Finish this surface with a wood float finish.

G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer. Saturate the grout surface by use of wet burlap, soaker hoses, ponding or other approved means. Provide sunshades as necessary. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.04 INSTALLATION - NONSHRINK EPOXY GROUTS

A. Mix in accordance with the procedures recommended by the manufacturer. Do not vary the ratio of components or add solvent to change the consistency of the grout mix. Do not overmix. Mix full batches only to maintain proper proportions of resin, hardener and aggregate.

B. Monitor ambient weather conditions and contact the grout manufacturer for special placement procedures to be used for temperatures below 60 or above 90 degrees F.

C. Place grout into the designated areas in a manner that will avoid trapping air. Placement methods shall ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.

D. Minimize "shoulder" length (extension of grout horizontally beyond base plate). In no case shall the shoulder length of the grout be greater than the grout thickness.

E. Finish grout by puddling to cover all aggregate and provide a smooth finish. Break bubbles and smooth the top surface of the grout in conformity with the manufacturer's recommendations.

F. Epoxy grouts are self curing and do not require the application of water. Maintain the formed grout within its recommended placement temperature range for at least 24 hours after placing, or longer if recommended by the manufacturer.

3.05 SCHEDULE

A. The following list indicates where the particular types of grout are to be used:

1. General purpose nonshrink grout: Use at all locations where non shrink grout is called for on the Drawings except for base plates greater in area than 3-ft. wide by 3-ft. long and except for the setting of anchor rods, anchor bolts or reinforcing steel in concrete.

2. Flowable nonshrink grout: Use under all base plates greater in area than 3-ft. by 3-ft. Use at all locations indicated to receive flowable nonshrink grout by the Drawings. The Contractor, at his/her option and convenience, may also substitute flowable nonshrink grout for general purpose nonshrink grout.

3. Nonshrink epoxy grout: Use for the setting of anchor rods, anchor bolts and reinforcing steel in concrete and for all locations specifically indicated to receive epoxy grout.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to complete and install fabricated metal items. Furnish all supplementary items necessary for their proper installation.

B. Check Drawings carefully and furnish all anchors, sleeves, bolts, brackets, clips, inserts, angles, plates and other miscellaneous metal not distinctly specified under other sections but necessary to complete the Work.

1.02 RELATED WORK

A. Surface Preparation and Shop Painting and Coating are included in Section 09910.

B. Field Painting and Protective Coating are included in Section 09920.

1.03 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

1. Standard Specification for Highway Bridges

B. American Institute of Steel Construction (AISC)

1. Steel Construction Manual, Ninth Edition

2. Manual of Steel Construction - Load & Resistance Factor Design, Second Edition

C. American National Standards Institute (ANSI)

1. ANSI B18.2.1 - Square and Hex Bolts and Screws, Inch Series

D. American Society for Testing & Materials (ASTM)

1. ASTM A36 - Standard Specification for Structural Steel

2. ASTM A48 - Specification for Gray Iron Castings

3. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

4. ASTM A108 - Standard Specification for Steel Bars, Carbon, Cold Finished, Standard Quality

5. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

6. ASTM A125 - Specification for Steel Springs, Helical, Heat Treated

7. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

8. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

9. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Services

10. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for High Pressure or High Temperature Service, or Both

11. ASTM A276 - Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes

12. ASTM A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

13. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

14. ASTM A312 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipe

15. ASTM A320 - Specification for Alloy-Steel Bolting Materials for Low-Temperature Service

16. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

17. ASTM A366 - Standard Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality

18. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts

19. ASTM F436 - Standard Specification for Hardened Steel Washers

20. ASTM F594 - Standard Specification for Stainless Steel Nuts

21. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

22. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts

23. ASTM A569 - Specification for Steel, Carbon, (0.15 Maximum Percent) Hot Rolled, Sheet and Strip, Commercial Quality

24. ASTM A575 - Specification for Steel Bars, Carbon, Merchant Quality, M-Grades

25. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low Alloy and High-Strength Low-Alloy with Improved Formability

26. ASTM B98 - Specification for Copper-Silicon Alloy Rod, Bar, and Shapes

27. ASTM B210 - Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes

28. ASTM B221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes

29. ASTM B438 - Specification for Sintered Bronze Bearings (Oil-Impregnated)

30. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel

E. American Welding Society (AWS)

1. AWS D1.1 Structural Welding Code - Steel

2. AWS D1.2 Structural Welding Code - Aluminum

3. AWS A2.0 Standard Welding Symbols

F. Federal Specifications

1. FSSQQ-F-461 C (1) - Floor Plate, Steel, Rolled

G. The Society for Protective Coatings (SSPC)

1. SSPC SP-1 - Surface Preparation Specification No.1 "Solvent Cleaning"

2. SSPC SP-2 - Surface Preparation Specification No.2 "Hand Tool Cleaning"

3. SSPC SP-3 - Surface Preparation Specification No.3 "Power Tool Cleaning"

4. SSPC SP-6 - Surface Preparation Specification No.6 "Commercial Blast Cleaning"

5. SSPC SP-10 - Surface Preparation Specification No.10 "Near-White Blast Cleaning"

1.04 SUBMITTALS

A. Prior to fabrication, submit Shop Drawings and product data in accordance with Section 01300, showing methods of assembly, anchorage and connection to other members. Indicate welded connections in accordance with AWS A2.0. Shop Drawings will be required for all items included under this Section.

B. Submit samples as requested by the Owner during the course of construction.

1.05 QUALITY ASSURANCE

A. Coordinate completely the work of this Section with the work of other Sections. Verify at the Site both the dimensions and work of other trades adjoining items of work in this Section before fabrication and installation of the items specified.

B. Furnish to the pertinent trades all items included under this section that are to be built into the work of other Sections.

C. All welding shall be performed by qualified welders and shall conform to the applicable AWS welding code. Welding of steel shall conform to AWS D1.1.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver items to be incorporated into the work of other trades in sufficient time to be checked prior to installation.

B. Store delivered items off the ground and protected from dirt and weather.

PART 2 - PRODUCTS

2.01 STEEL FABRICATIONS

A. Materials

1. Structural steel shapes, plates, bars and rods: ASTM A36

2. Steel plates - bent or cold-formed: ASTM A283, Grade C

3. Welded and seamless rectangular steel tubing: ASTM A500, Grade B

4. Steel sheets: ASTM A366

5. Carbon steel bolts, studs, nuts and washers: ASTM A307

6. High strength bolts, studs, nuts and washers for structural steel:

   a. Elevated temperature exposures: ASTM A325-Type I

   b. General application: ASTM A325-Type I or II
   Exterior application: ASTM A325 Mechanically Galvanized per ASTM B695, Class 50, Type II

7. Welding Materials AWS D1.1

8. Shop and Touch-up Primer: SSPC Paint 15 Type I red oxide

B. Fabrication

1. See general fabrication requirements in Paragraph 2.04.

2. Fabricate miscellaneous steel in accordance with the Drawings. Fabrications include beams, angles, support brackets, anchor bolts and any other miscellaneous steel called for on the Drawings and not otherwise specified.

3. Thoroughly clean steel fabrications of all loose mill scale, rust, grease or oil, moisture, dirt, or other foreign matter and finish in compliance with Division 9 requirements.

C. Finishes

1. Shop priming and field coating shall be as per Division 9.

2.02 STAINLESS STEEL FABRICATIONS

A. Materials

1. Plates, sheets and structural shapes:

   - exterior, submerged or industrial use ASTM A167, Type 316
   - interior and architectural use ASTM A167, Type 304

2. Pipes: ASTM A312

3. Bolts, nuts and washers: ASTM A276, Type 316 or Type 304

B. Fabrication

1. See general fabrication requirements in Paragraph 2.04.

2.03 ANCHORS, BOLTS, AND FASTENING DEVICES

A. Furnish anchors, bolts, fasteners, etc., as necessary for installation of the work of this Section or for securing the work of other Sections to in-place construction.

B. The bolts used to attach the various members to the anchors shall be the sizes shown or required. Attach aluminum and stainless steel to concrete by means of stainless steel machine bolts. Attach iron or steel with steel machine bolts unless otherwise specifically noted. Bolts and nuts shall be hexagon type.

C. Bolt Requirements: Bolts shall comply with the following:

1. The nuts shall be capable of developing the full strength of the bolts. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads. Bolts and cap screws shall have hexagon heads and nuts shall be Heavy Hexagon Series.

2. The length of all bolts shall be such that after joints are made up, each bolt shall extend through the entire nut, but in no case more than 1/2-inch beyond the nut.

D. Standard Service Bolts (Not Buried or Submerged): Except where otherwise indicated, bolts and nuts shall be steel and shall be galvanized after fabrication. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. Except as otherwise indicated herein, steel for bolts, anchor bolts and cap screws shall be in accordance with the requirements of ASTM A325 or threaded parts of ASTM A36. ASTM A320 and A325 bolts and nuts shall not be galvanized.

E. Flange bolts for standard service shall be ASTM A193, Grade B7 with ASTM A194 Grade 1 nuts. Flange bolts for buried or submerged service shall be ASTM A193 Grade B8N with ASTM A194 Grade 8 nuts. Bolts and nuts shall have hexagonal dimensions in accordance with ANSI/ASME B18.2.1.

F. Anchor bolts shall comply with the following:

1. Anchor bolts shall be fabricated of materials complying with SSPWC Subsections 206-1.4.3 and 209-3.2, and as follows:

Steel bolts	ASTM A325
Fabricated steel bolts	ASTM A36
Stainless steel bolts, nuts, washers	ASTM A320, type 316

2. Anchor bolt holes in equipment support frames shall not exceed the bolt diameters by more than 25 percent, up to a maximum oversizing of 1/4-inch. Unless otherwise indicated, minimum anchor bolt diameter shall be 1/2-inch. Anchor bolts for equipment shall be 316 stainless steel and shall be provided with leveling nuts that shall be tightened against flat surfaces to not less than 10 percent of the bolt's safe tensile stress.

3. Tapered washers shall be provided where mating surface is not square with the nut.

4. Expansion, wedge, or adhesive anchors set in holes drilled in the concrete after the concrete is placed are not permitted as substitution for anchor bolts, except where otherwise indicated. Upset threads shall not be acceptable.

5. ASTM A307 anchor bolts are prohibited.

G. Automatic end welded headed anchor studs shall be flux-ended studs made from cold drawn steel, ASTM A108 Grades C-1010 through C-1020. Headed anchor studs shall be Nelson, H4L Headed Concrete Anchors or Nelson, S3L Shear Connectors or equal.

H. For structural purposes, unless otherwise noted, drilled-in concrete anchors shall be adhesive or expansion type anchor bolts. Drilled-in anchors shall have ICBO certified permissible values and comply with the requirements of Section 2624(d) of the California Building Code.

1. Adhesive Anchors shall be a two-part stud and cartridge resin anchoring system. Stud assemblies shall be as indicated on the Drawings and shall include all-thread anchor rod with nut and washer. Provide manufacturer's recommended drive units and adaptors for installing studs. Install anchors in full compliance with the manufacturer's recommendations. Adhesive anchors shall be Hilti HIT HY-150 systems by Hilti, Inc., Tulsa, OK; Anchor-it Fastening Systems by Adhesives Technology Corporation, Kent, WA; Epcon System by ITW Ramset/Red Head, Wooddale, IL, or equal.

2. Expansion Anchors shall be wedge type anchors of the sizes noted on the Drawings complete with nuts and washers. Unless otherwise noted, provide zinc plated carbon steel anchors. Stainless steel anchors, where required, shall be all AISI Type 316 construction. When the length or embedment of the bolt is not noted on the Drawings, provide length sufficient to place the wedge and expansion sleeve portion of the bolt at least one inch behind the reinforcing steel within the concrete.

   a. Acceptable Manufacturers: Hilti: "Kwik-Bolt II," ITW Ramset/Red Head: "Trubolt Wedge," or equal.

2.04 FABRICATION - GENERAL

A. Form all miscellaneous metal work true to detail, with clean, straight, sharply defined profiles, and smooth surfaces of uniform color and texture. Provide fabrications free from defects impairing strength or durability. Drill or punch holes and smooth edges. Ease exposed edges to a small, uniform radius. Fabricate supplementary pieces necessary to complete each item though such pieces are not definitely shown or specified.

B. Supply components required for anchorage of fabrications. Steel accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fitting.

C. Welded joints shall be rigid and continuously welded or spot welded as specified or shown. Dress the face of welds flush and smooth. Continuously weld and grind smooth welds that will be exposed. Exposed joints shall be close fitting and jointed where least conspicuous. Conceal fastenings where practical. Punch or drill for temporary field connections and for attachment of the work of other trades.

D. Welding of parts shall comply with the latest edition of the AWS structural welding code for steel (D1.1). Welding shall be performed only by welders certified to perform the required welding in compliance with the requirements of the AWS Code.

E. Castings shall be of good quality, strong, tough, even-grained, smooth, free from scale, lumps, blisters, sand holes and defects of any kind that render them unfit for the service for which they are intended. Thoroughly clean castings. Castings may be subjected to a hammer inspection in the field by the Owner. All finished surfaces shown on the Drawings and/or specified shall be machined to a true plane surface allowing pieces to seat at all points without rocking. Make allowances in the patterns so that thicknesses specified or shown will not be reduced in obtaining finished surfaces. Castings will not be acceptable if the actual weight is less than 95 percent of the theoretical weight computed from the dimensions shown. Provide facilities for weighing castings in the presence of the Owner and show true weights, certified by the supplier.

F. Shop painting will not be required for galvanized metal, stainless steel, aluminum, copper, brass and bronze unless specifically specified.

2.05 IRON CASTINGS

A. Castings shall conform to the requirements of ASTM A48 unless otherwise indicated. Castings weighing less than 100 pounds shall be hot-dip galvanized after machining. Castings weighing greater than 100 pounds shall be galvanized where indicated.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Install all items furnished except items to be embedded in concrete that shall be installed under Division 3. Items to be attached to concrete after such work is completed shall be installed in compliance with the details shown. Furnish to appropriate trades all anchors, sockets, or fastenings required for securing work to other construction.

B. Set metalwork level, true to line and plumb as indicated.

C. Weld field connections and grind smooth where practicable. Clean and strip primed, steel items to bare metal where site welding is required. Conceal fastenings where practicable.

D. Secure metal to wood with lag screws, of adequate size, with appropriate washers.

E. Touch-up abrasions to finish or primer coatings immediately after erection and prior to both final coating and final acceptance.

F. Break contact between dissimilar metals as shown on the Drawings or as specified in Paragraph 3.01G.

G. Field-apply coatings for installation of metal fabrications according to the following schedule:

1. Embedded items and embedded portions of items.

2. All steel surfaces in contact with exposed concrete shall receive a protective coating of an approved heavy bitumastic troweling mastic applied in compliance with the manufacturer's instructions prior to installation.

3. Where aluminum contacts a dissimilar metal, apply a heavy brush coat of zinc-chromate primer followed by two coats of aluminum metal and masonry paint to the dissimilar metal.

4. Where aluminum contacts concrete, apply a heavy coat of zinc chromate primer to the surface of the aluminum.

5. Where aluminum contacts wood, apply two coats of aluminum metal and masonry paint to the wood.

6. Exposed items and parts shall be field painted as per Section 09920.

3.02 INSTALLATION OF ADHESIVE AND EXPANSION ANCHOR BOLTS

A. Installation of adhesive, capsule and expansion anchors shall comply with the following:

1. Anchor diameter and grade of steel shall comply with equipment supplier specifications. Anchor shall be threaded or deformed full length of embedment and shall be free of rust, scale, grease, and oils.

2. Use shall be limited to applications where exposure to fire or concrete or to rod temperature above 120 degrees F is not indicated. Overhead applications (such as pipe supports) shall not be allowed.

3. Adhesive capsules of different diameters may be used to obtain proper volume for the embedment, but no more than two capsules per anchor may be used. When installing different diameter capsules in the same hole, the larger diameter capsule shall be installed first. Any extension or protrusion of the capsule from the hole is prohibited.

4. Holes shall have rough surfaces, such as can be achieved using a rotary percussion drill.

5. Holes shall be blown clean with compressed air and be free of dust or standing water prior to installation.

6. Anchor shall be left undisturbed and unloaded for full adhesive curing period.

3.03 INSTALLATION OF ADHESIVE ANCHOR BOLTS

A. Installation of adhesive and capsule anchors shall comply with the following:

1. Use shall be limited to locations where exposure to acid concentrations higher than 10 percent, to chlorine gas, or to machine or diesel oils, is not indicated.

2. All installation recommendations by the anchor system manufacturer shall be followed carefully, including maximum hole diameter.

3. Concrete temperature (not air temperature) shall be compatible with curing requirements recommended by adhesive manufacturer. Anchors shall not be placed in concrete below 25 degrees F.

3.04 INSTALLATION OF SEAT ANGLES, SUPPORTS AND GUIDES

A. Seat angles shall be set flush with the floor.

3.05 INSTALLATION OF DRILLED ANCHORS

A. Drilled anchors shall be installed in strict accordance with the manufacturer's instructions. Holes shall be roughened with a brush on a power drill, cleaned and dry. Drilled anchors shall not be installed until the concrete has reached the indicated 28 Calendar Days compressive strength. Adhesive anchors shall not be loaded until the adhesive has reached its indicated strength in accordance with the manufacturer's instructions.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 09910

SURFACE PREPARATION AND SHOP PAINTING AND COATING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required for the surface preparation and application of shop primers on exterior ferrous metals and shop coatings for valves and meters, excluding stainless steel unless otherwise noted, as specified herein.

1.02 RELATED WORK

A. Metal Fabrications are included in Section 05500.

B. Field Painting and Protective Coating are included in Section 09920.

1.03 SUBMITTALS

A. Submit to the Engineer, in accordance with Section 01300, Shop Drawings, manufacturer's specifications and data on the proposed primers and detailed surface preparation, application procedures and minimum dry film thicknesses. Submittals shall include at least the following:

1. Representative physical samples of the proposed primers if required by the Engineer.

2. Color charts for approval if required by the Engineer.

3. Technical data sheet from primer or paint manufacturer which includes recommended applications, recommended coating thicknesses for application, recoat window, and other information required to properly apply the primer or paint.

4. Minimum dry film thickness of primers and paints.

1.04 REFERENCE STANDARDS

A. American Society for Testing & Materials (ASTM)

1. ASTM A36 - Standard Specification for Structural Steel

2. ASTM A48 - Specification for Gray Iron Castings

3. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

4. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

5. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

6. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Services

7. ASTM A276 - Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes

8. ASTM A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

9. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

10. ASTM A312 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipe

B. American Water Works Association (AWWA)

1. AWWA C213 - Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines

2. AWWA C550 - Protective Interior Coatings for Valves and Hydrants

C. NACE International

1. NACE SP0188 - Discontinuity (Holiday) Testing of Protective Coatings

D. The Society for Protective Coatings (SSPC)

1. SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning

2. SSPC-SP 10/NACE No. 2 Near-White Blast Clean11

1.05 DEFINITIONS

A. Submerged exterior surfaces: Items subject to submersion, splash action, high humidity or within vaults

B. Non-submerged surfaces: Items not subject to submersion, splash action, high humidity or within vaults

C. Buried exterior surfaces: Items that are buried

D. Submerged interior surfaces: Items that contain water

E. Non-primed surfaces: Items provided by the manufacturer not requiring coatings

PART 2 - PRODUCTS

2.01 MATERIALS FOR NON-GALVANIZED METALS

A. Submerged Exterior Surfaces

1. All moving parts such as handwheels, levers, operating nuts, etc. - Spray apply three coats of Tnemec Co., Inc. Hi-Build Epoxoline Series L69 to a dry film thickness of 3.5 to 5.0 mils per coat or an approved equal by Valspar, DeVoe, DuPont or equal.

2. All non-moving parts such as valve bodies, flanges, bolts, couplings, etc. surfaces shall be coated.

B. Non-Submerged Surfaces - Spray apply two coats of Tnemec Co., Inc. Hi-Build Epoxoline Series L69 to a dry film thickness of 3.0 to 5.0 mils per coat or an approved equal by Valspar, Devoe, DuPont or equal.

C. Buried Exterior Surface - All buried exterior surfaces shall be fusion-bonded epoxy coated.

D. Submerged Interior Surfaces

1. Apply a chemically cured two-part epoxy coating which is non-hygroscopic, non-water soluble and non-toxic. The coating shall be of the hard high impact type that has resistance to impact and adhesive qualities so that it will not bruise or lose its adhesion to metal as the result of a blow of a wood, rubber or plastic hammer. Coating material shall have sufficient pigmentation to show evenness and thickness of coating application.

2. Epoxy resin coating of the catalyst-cured type shall be Induron Ruff-Stuff 3300HMW Epoxy or Tnemec Pota-Pox Series L140F, or an approved equivalent. Epoxy resin coating shall be applied to produce a minimum MDFT of 10.0 mils.

3. As an alternative to epoxy resin or where specified elsewhere in these Specifications, fusion bonded epoxy shall be used. Fusion bonded epoxy shall be applied in accordance with ANSI/AWWA C213 or C550, as applicable, except that the surface preparation shall be as specified herein.

4. The fusion-bonded epoxy shall be applied using the fluidized bed or electrostatic spray process. Coating shall be 16 mils thick, Scotchkote 134 (electrostatic) or 206N (fluidized bed) or approved equivalent.

5. Holiday Testing: Coating integrity of all interior coated surfaces shall be tested in accordance with NACE SP0188 both in the factory and in the field.

E. Non-Primed Exterior Surfaces - A heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be of a quality and thickness as necessary to prevent corrosion during all periods of storage and installation.

F. Compatibility of Coating Systems - Shop priming shall be done with primers that are guaranteed by the manufacturer to be compatible with their corresponding primers and finish coats specified in Section 09920 for use in the field and which are recommended for use together.

G. Aluminum Fabrications - Apply a coat of methacrylate lacquer before shipment.

2.02 MATERIALS FOR GALVANIZED METALS

A. All metals to be galvanized shall receive a coating of zinc applied by immersion in a bath of molten zinc and allowing the items to remain in the bath until their temperature becomes the same as the bath, to a coating of not less than 2 ounces per square foot of surface.

PART 3 - EXECUTION

3.01 APPLICATION

A. Surface Preparation

1. Surfaces of materials to be shop primed shall be prepared as follows:

Materials	Shop Surface Preparation
Non-Galvanized Metals:	
- Submerged Exterior Surfaces	SSPC-SP 10
- Non-Submerged Surfaces	SSPC-SP 6
- Buried Exterior Surfaces	SSPC-SP 10
- Submerged Interior Surfaces	SSPC-SP 10
- Non-Primed Surfaces	Per manufacturer's recommendations
Galvanized Metals:	
- All surfaces	Thoroughly clean and roughen entire surface by abrasive blast with fine abrasive to achieve a 1.5-2.0 anchor profile.

2. Remove scale, rust and other deleterious material. Surfaces shall be clean, dry and free of dust, oil, grease and other foreign material prior to priming.

B. Shop Prime Coat

1. Metal surfaces that will be inaccessible after erection shall receive two shop coats of the appropriate primer.

2. Shop Prime Coating Application Schedule: After preparation of surfaces, apply prime coats in accordance with the following table unless otherwise specified in the Contract Documents.

Materials	Application
Non-galvanized metals:	
- Submerged exterior surfaces	Items subject to submersion, splash action, high humidity or within vaults. These items may include fabricated ferrous pipe, couplings, valves, flanges, etc.
- Non-submerged surfaces	Items not subject to submersion, splash action, high humidity or within vaults. These items may include miscellaneous fabricated metals, piping and appurtenances within buildings or above ground enclosures
- Buried exterior surfaces	Items that are buried. These items may include valves, couplings, flanges, bolts, nuts, etc.
- Submerged interior surfaces	Items that contain water. These items may include valves, couplings, meters, etc.
- Non-primed surfaces	Items provided by the manufacturer not requiring coatings. These items may include gears, bearing surfaces, other similar items obviously not to be primed.
Galvanized Metals:	
- All surfaces	Fabricated metals subject to submersion, splash action, and high humidity or within vaults. These items include interior and exterior of corrugated metal pipe and may also include miscellaneous metals such as ladders, railing, fences, bolts, nuts, plates, supports, hangers, etc.

C. All items to be shop primed shall be blast cleaned as specified for applicable service prior to priming. If, in the opinion of the Owner, any prime coating has been improperly applied or if material contrary to this Section has been used, that coating shall be removed by abrasive blasting to white metal and reprimed in accordance with this Section.

D. All shop prime coats shall be of the correct materials and applied in accordance with this Section. Remove any prime coats not in accordance with this Section by blast cleaning and apply the specified prime coat at no additional cost to the Owner.

E. Shop primed surfaces shall be cleaned thoroughly and damaged or bare spots prepared as approved and retouched with the specified primer before the application of successive paint coats in the field.

F. Properly protect the shop prime and finish coats against damage from weather or any other cause.

G. A shop finish coat shall be equal in appearance and protection quality to a field applied finish coat. If, in the opinion of the Owner, a shop finish coat does not give the appearance and protection quality of other work of similar nature, prepare the surfaces and apply the coat or coats of paint as directed by the Owner to accomplish the desired appearance and protection quality. Submit to the Owner substantial evidence that the standard finish is compatible with the specified finish coat.

H. Wherever fabricated equipment is required to be blast cleaned, protect all motors, drives, bearings, gears, etc. from the entry of grit. Any equipment found to contain grit shall be promptly and thoroughly cleaned.

I. Use painting methods that will result in full coverage of joints, corner, edges and all exposed surfaces.

J. Quenching of parts with water to cool following galvanizing is not allowed. If water quenching is used, the component in question will be rejected.

K. Treating of galvanized parts to prevent the formation of wet storage stains or other such treatment not directly related to the final coating system is not allowed. If any post treatments are used on the galvanized part not directly related to the final coating system, the component in question will be rejected.

3.02 EVALUATION AND REPAIRS

A. Thickness Testing: Thickness of coatings and paints shall be tested with a non-destructive film thickness gauge. An instrument such as a Tooke Gauge shall be used if a destructive tester is deemed necessary. Testing shall be accomplished in conformance to SSPC-PA2, "Measurement of Dry Paint Thickness with Magnetic Gauges."

B. Holiday Testing: Coating integrity of all interior coated surfaces shall be tested with an approved testing device. All pinholes shall be marked and repaired. No pinholes or other irregularities will be permitted in the final coating.

C. Inspection Devices: The Contractor will furnish, until final acceptance of coatings and paints, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness. The Contractor shall also furnish U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates to test accuracy of thickness gauges. Dry film thickness gauges and holiday detectors shall be available at all times until final acceptance of application. Inspection devices shall be operated by or in the presence of the Owner with location and frequency basis determined by the Owner.

D. All deficiencies found in coatings and paints shall be repaired in accordance with the manufacturer's printed recommendations.

E. For field repairs of fusion-bonded epoxy, the use of a liquid epoxy will be permitted, applied in one coat to provide a DFT of 16 mils. The liquid epoxy shall be compatible and from the same manufacturer of material for fusion bonded epoxy.

END OF SECTION

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TECHNICAL PROVISIONS

SECTION 09920

FIELD PAINTING AND PROTECTIVE COATING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish all materials, labor, equipment and incidentals required and perform all the painting necessary to complete the Work in its entirety as specified herein.

B. It is the intent of this Section to paint all exposed structural and miscellaneous steel; mechanical equipment, pipe, fittings and valves; infill materials to match existing adjacent materials as approved; and all other work obviously required to be painted unless otherwise specified. Minor items not mentioned in the schedule of work shall be included in the work of this Section where they come within the general intent of this Section as stated herein.

1.02 RELATED WORK

A. Metal Fabrications are included in Section 05500.

1.03 SUBMITTALS

A. Submit the following to the Engineer in accordance with Section 01300:

1. Color cards for initial color selections by the Owner.

2. Three sets of 8-inch by 8-inch samples, on ¼-inch hardboard, of all colors required for all types of paint if requested by the Owner. Include special colors as required. Resubmit until approved.

3. Product data for polyethylene wrap and adhesive tape.

4. Technical data sheet from primer or paint manufacturer which includes recommended applications, recommended coating thicknesses for application, recoat window, and other information required to properly apply the primer or paint.

5. Minimum dry film thickness of primers and paints.

1.04 REFERENCE STANDARDS

A. The Society for Protective Coatings (SSPC)

1. SSPC SP-1 - Surface Preparation Specification No. 1, Solvent Cleaning

2. SSPC SP-2 - Surface Preparation Specification No. 2, Hand Tool Cleaning

1.05 DEFINITIONS

A. Submerged exterior surfaces: Items subject to submersion, splash action, high humidity or within vaults.

B. Non-submerged surfaces: Items not subject to submersion, splash action, high humidity or within vaults

C. Buried exterior surfaces: Items that are buried

D. Submerged interior surfaces: Items that contain water

E. Non-primed surfaces: Items provided by the manufacturer not requiring coatings

PART 2 - PRODUCTS

2.01 MATERIALS

A. All painting materials shall be by the Tnemec Company, Inc.; Valspar Co.; Dupont; DeVoe or equal unless otherwise specified. The painting schedule has been prepared based on Tnemec products (unless otherwise noted) and Tnemec recommendations for application. No brand other than those named will be considered for approval unless the brand and type of paint proposed for each item in the following schedule together with sufficient data substantiated by certified tests conducted at no expense to the Owner are submitted to the Owner within 30 Calendar Days after execution of the Agreement to demonstrate its equality to the paint(s) named. The type and number of tests performed shall be subject to the Owner's approval.

B. All painting materials shall be delivered in unbroken packages, bearing the manufacturer's brand and name. They shall be used without adulteration and mixed, thinned and applied in strict accordance with manufacturer's directions for the applicable materials and surfaces.

C. Shop priming shall be done with primers that are guaranteed by the manufacturer to be compatible with the finish paints to be used. Refer to Section 09910 for special primers.

D. No paint containing lead will be allowed. Oil shall be pure boiled linseed oil.

E. Work areas will be approved by the Owner for storage and mixing of all painting materials. Materials shall be in full compliance with the requirements of pertinent codes and fire regulations. Proper containers shall be provided outside of the buildings and used for painting wastes. No sanitary or storm sewers shall be used for this purpose.

F. All paint shall comply with local regulations regarding the release of volatile organic compounds (VOC's).

2.02 COLOR SELECTIONS

A. Color of above ground facilities shall be yellow within agricultural areas and tan otherwise. Exact shade(s) shall be determined by the Owner. Final color and color shade selection(s) of other items shall be by the Owner. Contact the Owner for direction prior to submittal of colors for selection.

B. All valves and mechanical equipment to be painted shall be gray in color.

PART 3 - EXECUTION

3.01 PREPARATION OF SURFACES

A. All surfaces to be painted shall be prepared as specified herein and shall be dry and clean before painting.

B. All metal welds, imperfections, etc. shall be ground and sanded smooth. All pits and dents shall be filled and all imperfections shall be corrected to provide a smooth surface for painting. All rust, loose scale, oil, tar and asphalt bearing coatings, grease and dirt shall be removed by use of approved solvents, wire brushing, grinding or sanding.

C. All PVC pipe and other plastic matrix surfaces to be painted shall be lightly sanded and cleaned of residue before painting.

D. Aluminum, stainless steel and copper surfaces shall have all oxidation and foreign material removed before painting by SSPC SP-1, using an approved V.O.C. compliant method. When ordered, metal surfaces specified above shall be hand tool cleaned to SSPC SP-2 standards to provide a uniform 1 mil surface profile.

E. Where field welding of galvanized material is necessary, welds shall be wire brushed clean and immediately regalvanized in the field using galvanizing compound or coating. Materials shall comply with local regulations controlling use of volatile organic compounds.

3.02 PAINTING SCHEDULE

A. All colors will be selected by the Owner.

B. The following types of paints by Tnemec Co. have been used as a basis for the paint schedule:

1. Epoxoline (Series L69) - polyamidoamine cured epoxy
2. PotaPox (Series L140F) - polyamidoamine cured epoxy
3. Envirofill (No. 130-6601) - waterborne cementitious acrylic
4. Endura-Shield (Series 1081) - aliphatic acrylic WB polyurethane
5. Enviro-Pox (Series 287-Gloss) - high-build waterborne acrylic epoxy
6. Tnemec-Crete (Series 180) - acrylic texture coating
7. Masonry Filler (Series 218) - modified epoxy cement
8. Enduratone SG (Series 1029) - acrylic emulsion

C. The following surfaces shall have the types of paint and protective coating scheduled below.

1. Submerged Exterior Surfaces - Submerged ferrous metals and ferrous metals subject to submersion, splashing, high humidity, or within vaults as indicated to be painted in Section 09910 shall be lightly sanded or abraded before application of finish coats.

   1 coat Series L69 on properly prepared unprimed metal or touch-up (3.0-4.0 mils DFT)
   2 coats Series L140F (5.0 mils DFT, Total 10 mils DFT)

2. Exterior non-submerged ferrous metals

   1 coat Series L69 on properly prepared unprimed metal or touch-up (3.0-4.0 mils DFT)
   1 coat Series L140F (4.0 mils DFT)

   1 coat minimum Series 1081 (3.0 mils DFT)

3. Interior non-submerged ferrous metals

   1 coat Series L69 on properly prepared unprimed metal or touch-up (3.0-4.0 mils DFT)
   2 coats Series L140F (3.0 mils DFT, Total 6 mils DFT)

4. Buried exterior surfaces of ferrous metals, including valve bodies, meters, couplings, flanges, blind flanges, pipes and nuts and bolts.

5. Aboveground cabinets and vents

   Primer: Series L140F 1 coat (5.0 mils DFT)
   Color/Intermediate Coat: Series 73 1 coat (5.0 mils DFT)
   Top Coat where Exposed to Environment: Series 76 1.coat (2.0 mils DFT)
   Top Coat where Not Exposed to Environment: Series 73 1 coat (3.0 mils DFT)

   Color similar to Dunn-Edwards Adobe or Tnemec Safety Yellow

6. Plastic piping and components

   2 coats Series L140F (3.0 DFT, Total 6 mils DFT)

3.03 WORKMANSHIP

A. General:

1. At the request of the Owner, samples of the finished work prepared in strict accordance with this Section shall be furnished and all painting shall be equal in quality to the approved samples. Finished areas shall be adequate for determining the quality of workmanship. Experimentation with color tints shall be furnished to the satisfaction of the Owner where standard chart colors are not satisfactory.

2. Protection of furniture and other movable objects, equipment, fittings, concrete pads and foundations and accessories shall be provided throughout the painting operation. Canopies of lighting fixtures shall be loosened and removed from contact with surface, covered and protected and reset upon completion. Remove all electric plates, surface hardware, etc., before painting. Protect and replace when completed. Mask all machinery nameplates and all machined parts not receiving a paint finish. Dripped or spattered paint shall be promptly removed. Lay drop cloths in all areas where painting is being done to adequately protect flooring and other work from all damage during the operation and until the finished job is accepted.

3. On metal surfaces, apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mil thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. One gallon of paint as originally furnished by the manufacturer shall not cover a greater area when applied by spray gun than when applied unthinned by brush. Deficiencies in film thickness shall be corrected by the application of an additional coat(s). On porous surfaces, it shall be the painter's responsibility to achieve a protective and decorative finish either by decreasing the coverage rate or by applying additional coats of paint.

B. Field Priming:

1. All piping and other metals not shop primed and delivered to the field may be sent back to the shop for shop priming at the discretion of the Owner. Items allowed to be field primed shall receive the same surface preparation and prime coat per Section 09910.

2. Equipment that is specified to receive a baked-on enamel finish or other factory finish shall not be field painted unless the finish has been damaged in transit or during installation. Surfaces that have been shop painted and have been damaged or where the shop coat or coats of paint have deteriorated, shall be properly cleaned and retouched before any successive painting is done on them in the field. All such field painting shall match as nearly as possible the original finish.

3. Equipment shipped with a protective shop painting coat or coats shall be touched up to the satisfaction of the Owner with primers as recommended by the manufacturer of the finish paint.

C. Field Painting:

1. All painting at the Site shall be designated as field painting and shall be under the direct and complete control of the Contractor and only skilled painters and specialists, where required, shall be used on the work.

2. All paint shall be at room temperature before applying, and no painting shall be done when the temperature is below 60 degrees F, in dust-laden air, when rain or snow is falling, or until all traces of moisture have completely disappeared from the surface to be painted.

3. Successive coats of paint shall be tinted to make each coat easily distinguishable from each other with the final undercoat tinted to the approximate shade of the finished coat.

4. Finish surfaces shall not show brush marks or other irregularities. Undercoats shall be thoroughly and uniformly sanded with the type of paper appropriate for the undercoats to remove defects and provide a smooth even surface.

5. Painting shall be continuous and shall be accomplished in an orderly manner to facilitate inspection. Materials subject to weather shall be prime coated as quickly as possible. Surfaces of exposed members that will be inaccessible after erection shall be cleaned and painted before erection.

6. All painting shall be performed by approved methods with number of coats modified as required to obtain the total dry film thickness specified. Spray painting shall be performed specifically by methods submitted and as approved by the Engineer.

7. All surfaces to be painted as well as the atmosphere in which painting is to be done shall be kept warm and dry by heating and ventilation, if necessary, until each coat of

paint has hardened. Heating and ventilation methods used shall not cause discoloration of the finish coat. Any defective paint shall be scraped off and repainted in accordance with the Owner's directions.

8. Before final acceptance of the Work, all damaged surfaces of paint shall be cleaned and repainted as directed by the Owner.

3.04 CLEANUP

A. At all times, keep the premises free from accumulation of waste material and rubbish caused by employees or work. At the completion of the painting, remove all tools, scaffolding, surplus materials and all rubbish from and about the Site and leave the work "broom clean" unless more exactly specified.

B. Upon completion, remove all paint where it has been spilled, splashed, or spattered on all surfaces, including floors, fixtures, equipment, furniture, concrete pads, concrete foundations, etc. leaving the work ready for inspection.

END OF SECTION

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