BEAUMONT-CHERRY VALLEY WATER DISTRCT

CONTRACT DOCUMENTS

FOR

NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING PROJECT

Beaumont-Cherry Valley Water District
Attn: Mark Swanson
560 Magnolia Avenue
Beaumont, CA 92223
mark.swanson@bcvwd.org

REGISTERED PROFESSIONAL ENGINEER
DANIEL KEITH JAGGERS
No. 52990
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

Signature: _____ 2/13/2020

General Manager
Beaumont-Cherry Valley Water District

KEY DATES (Subject to change at discretion of District):

Issue Date:	February 13, 2020
District Project Manager:	Mark Swanson

BEAUMONT-CHERRY VALLEY WATER DISTRICT
NOBLE CREEK RECHARGE FACILITY PHASE I FENCING PROJECT

CONTRACT DOCUMENTS

TABLE OF CONTENTS

NOTICE INVITING BIDS

NOTICE INVITING BIDS Sealed bids will be received only at Beaumont-Cherry Valley Water District (Owner), 560 Magnolia Avenue, Beaumont, California, 92223 Telephone (951) 845-9581 until **3:00 p.m.** local time on **Wednesday, March 11, 2020** for **Noble Creek Recharge Facility Fencing Project.**

WORK: The Work includes the provision of all equipment, labor, and materials to install and construct approximately 2,750 Linear Feet of fencing, gates, and appurtenances to secure the BCVWD Noble Creek Recharge Facility Phase I site, as specified and shown in the Construction Documents:

- Noble Creek Recharge Facility Phase I Fencing

The project site is located in Cherry Valley, County of Riverside, California.

COMPLETION OF WORK: The work shall be performed by a single contractor under a single contract. All work must be completed within 45 calendar days from Date of Award.

OBTAINING CONTRACT DOCUMENTS: A PDF copy of the compete bid package is available on the District Website at www.BCVWD.org. Alternatively, a copy of the complete bid package is available upon request from the District's Engineering Department. A charge of $10.00 will be made for each hard copy of each bid package requested.

OPENING OF BIDS: Bids will be publicly opened and read aloud at the place and time stated above Bidders are invited to be present. Bidders may examine the Contract Documents at Beaumont-Cherry Valley Water District, 560 Magnolia Ave., Beaumont, California, 92223.

PERIOD FOR AWARD: If Owner elects to award a contract for the Work, the award will be made within sixty (60) calendar days from the date of bid opening.

WAGE RATES: The Director of the Department of Industrial Relations has ascertained the general prevailing rate of per diem wages and the general rate of holiday and over-time work in the locality in which the work is to be performed for each craft or type of workmen needed to execute the Contract or Work as hereinafter set forth (see Labor Code 1770 et.seq.). Copies of rates are on file at the office of the Owner, which copies shall be made available to any interested party on request. The successful Bidder shall post a copy of such determinations at each job site. Attention is called to the fact that not less than the minimum salaries and all Contractors and Subcontractors shall pay wages on this Project.

LICENSING REQUIREMENTS: Bidders shall be licensed in accordance with provisions of Chapter 9, Division 3, of the Business and Professional Code of the State of California on the date and time of submittal of the bid documents and shall maintain such license until final acceptance of the work. Required classifications are: Class A, General Engineering and/or C-13, Fencing Contractor. Bidders shall have verifiable experience in similar work. Bidders and their sub-contractors shall also be registered to perform public work pursuant to Section 4104 of the public contract code with the State of California, Department of Industrial Relations.

The District cannot award a public works contract to any contractor or subcontractor whose company appears on the ineligible contractor's list published by the Labor Commission, per Labor Code,

Section 1777.1.

PROJECT ADMINISTRATION: All questions relative to this project prior to the opening of bids shall be directed to:

Mark Swanson
Beaumont-Cherry Valley Water District
560 Magnolia Avenue
Beaumont, CA 92223
Telephone: (951) 845-9581
Fax: (951) 845-0159

The Owner reserves the right to reject any or all Bids, to waive any informality or irregularity in any Bid and to make awards in the interest of the Owner, including award to other than the lowest bidder. The Owner reserves the right to have performed the entire Work defined by the Contract Documents or such parts of said Work as the Owner may elect, to combine various alternative bids and bid items within a Bid, and to accept or reject one or more separately scheduled bid items within a Bid. The Owner further reserves the right to withhold issuance of the Notice to Proceed, after execution of the Contract Agreement, for the period not to exceed fifteen (15) days after the date the Contract Agreement is executed. No additional payment will be made to the successful Bidder on account of such withholding.

NON-MANDATORY PRE-BID CONFERENCE: A **Non-mandatory** pre-bid conference with representatives of prospective bidders will be held at the Beaumont-Cherry Valley Water District offices, 560 Magnolia Avenue, Beaumont, California at 4:00 pm. on February 25, 2020. Prospective bidders are invited to present any relevant questions at the pre-bid conference, but insofar as practicable, questions should be prepared in written form and sent to Beaumont-Cherry Valley Water District so as to arrive not later than one (1) days prior to the **non-mandatory** pre-bid conference.

BID FORM

NAME OF BIDDER:_____

The undersigned, hereby declare that we have carefully examined the location of the proposed Work, and have read and examined the Contract Documents, including all plans, specifications, and all addenda, if any, for the following Project:

BEAUMONT-CHERRY VALLEY WATER DISTRICT

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project for the following BASE BID TOTAL BID PRICE for each bid option including any amounts payable by Owner for taxes which may result from this proposal whichever option is selected by the District:

BASE BID OPTION	BID PRICE (IN WRITTEN FORM)	BID PRICE (IN NUMBERS)
BID SCHEDULE 1A – 6' CHAIN LINK FENCE SYSTEM		
BID SCHEDULE 1B – 8' CHAIN LINK FENCE SYSTEM		
BID SCHEDULE 2A – 6' EXTRUDED BONDED CHAIN LINK FENCE SYSTEM		
BID SCHEDULE 2B – 8' EXTRUDED BONDED CHAIN LINK FENCE SYSTEM		
BID SCHEDULE 3A – 6' FUSED BONDED CHAIN LINK FENCE SYSTEM		
BID SCHEDULE 3B – 8' FUSED BONDED CHAIN LINK FENCE SYSTEM		

Bidder is notified that the District will select one of the six previously listed Base Bid Option.

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 1A – 6' Chain Link Fence System

Bid Item 101A - 104A to Establish Low Bidder and Bid Amount for Basic Work

Time of Completion: Forty-Five (45) Calendar Days

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
101A	6' High Chain Link Fencing	2,732	L.S.		
102A	Area 1 - 30' Wide Chain Link Double Swing Gate	3	EA.		
103A	Area 2 - 4' Wide Chain Link Swing Gate	4	EA.		
104A	Area 2 - 25' Wide Chain Link Double Swing Gate	1	EA.		

TOTAL BID SCHEDULE 1A PRICE (Sum of Bid Items 101A through 104A):

_____ Dollars $_____

(words) (figures)

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 1A – Additive Bid Items

Bid Schedule 1A Additive Bid Item(s) to Provide for Adjustment of Base Bid to Accommodate Increase in Work

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
110A	3-Strand Barbed Wire Along Top of Gates and Fencing	2,863	L.S.		

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 1B – 8' Chain Link Fence System

Bid Item 101B - 104B to Establish Low Bidder and Bid Amount for Basic Work

Time of Completion: Forty-Five (45) Calendar Days

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
101B	8' High Chain Link Fencing	2,732	L.S.		
102B	Area 1 - 30' Wide Chain Link Double Swing Gate	3	EA.		
103B	Area 2 - 4' Wide Chain Link Swing Gate	4	EA.		
104B	Area 2 - 25' Wide Chain Link Double Swing Gate	1	EA.		

TOTAL BID SCHEDULE 1B PRICE (Sum of Bid Items 101B through 104B):

_____ Dollars $_____

(words) (figures)

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 1B – Additive Bid Items

Bid Schedule 1B Additive Bid Item(s) to Provide for Adjustment of Base Bid to Accommodate Increase in Work

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
110B	3-Strand Barbed Wire Along Top of Gates and Fencing	2,863	L.S.		

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 2A – 6' Extruded Bonded Chain Link Fence System

Bid Item 201A - 204A to Establish Low Bidder and Bid Amount for Basic Work

Time of Completion: Forty-Five (45) Calendar Days

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
201A	6' High Extruded Bonded Chain Link Fencing	2,732	L.S.		
202A	Area 1 - 30' Wide Extruded Bonded Chain Link Double Swing Gate	3	EA.		
203A	Area 2 - 4' Wide Extruded Bonded Chain Link Swing Gate	4	EA.		
204A	Area 2 - 25' Wide Extruded Bonded Chain Link Double Swing Gate	1	EA.		

TOTAL BID SCHEDULE 2A PRICE (Sum of Bid Items 201A through 204A):

_____ Dollars $_____

(words) (figures)

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 2A – Additive Bid Items

Bid Schedule 2A Additive Bid Item(s) to Provide for Adjustment of Base Bid to Accommodate Increase in Work

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
210A	3-Strand Barbed Wire Along Top of Gates and Fencing	2,863	L.S.		

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 2B – 8' Extruded Bonded Chain Link Fence System

Bid Item 201B - 204B to Establish Low Bidder and Bid Amount for Basic Work

Time of Completion: Forty-Five (45) Calendar Days

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
201B	8' High Extruded Bonded Chain Link Fencing	2,732	L.S.		
202B	Area 1 - 30' Wide Extruded Bonded Chain Link Double Swing Gate	3	EA.		
203B	Area 2 - 4' Wide Extruded Bonded Chain Link Swing Gate	4	EA.		
204B	Area 2 - 25' Wide Extruded Bonded Chain Link Double Swing Gate	1	EA.		

TOTAL BID SCHEDULE 2B PRICE (Sum of Bid Items 201B through 204B):

_____ Dollars $_____

(words) (figures)

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 2B – Additive Bid Items

Bid Schedule 2B Additive Bid Item(s) to Provide for Adjustment of Base Bid to Accommodate Increase in Work

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
210B	3-Strand Barbed Wire Along Top of Gates and Fencing	2,863	L.S.		

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 3A – 6' Fused Bonded Chain Link Fence System

Bid Item 301A – 304A to Establish Low Bidder and Bid Amount for Basic Work

Time of Completion: Forty-Five (45) Calendar Days

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
301A	6' High Fused Bonded Chain Link Fencing	2,732	L.S.		
302A	Area 1 - 30' Wide Fused Bonded Chain Link Double Swing Gate	3	EA.		
303A	Area 2 - 4' Wide Fused Bonded Chain Link Swing Gate	4	EA.		
304A	Area 2 - 25' Wide Fused Bonded Chain Link Double Swing Gate	1	EA.		

TOTAL BID SCHEDULE 3A PRICE (Sum of Bid Items 301A through 304A):

_____ Dollars $_____

(words) (figures)

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 3A – Additive Bid Items

Bid Schedule 3A Additive Bid Item(s) to Provide for Adjustment of Base Bid to Accommodate Increase in Work

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
310A	3-Strand Barbed Wire Along Top of Gates and Fencing	2,863	L.S.		

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 3B – 8' Fused Bonded Chain Link Fence System

Bid Item 301B - 304B to Establish Low Bidder and Bid Amount for Basic Work

Time of Completion: Forty-Five (45) Calendar Days

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
301B	8' High Fused Bonded Chain Link Fencing	2,732	L.S.		
302B	Area 1 - 30' Wide Fused Bonded Chain Link Double Swing Gate	3	EA.		
303B	Area 2 - 4' Wide Fused Bonded Chain Link Swing Gate	4	EA.		
304B	Area 2 - 25' Wide Fused Bonded Chain Link Double Swing Gate	1	EA.		

TOTAL BID SCHEDULE 3B PRICE (Sum of Bid Items 301B through 304B):

_____ Dollars $_____

(words) (figures)

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

BID SCHEDULE 3B – Additive Bid Items

Bid Schedule 3B Additive Bid Item(s) to Provide for Adjustment of Base Bid to Accommodate Increase in Work

ITEM NO.	DESCRIPTION OF ITEMS	EST. QUANTITY	UNIT	UNIT PRICE (FIGURES)	TOTAL AMOUNT
310B	3-Strand Barbed Wire Along Top of Gates and Fencing	2,863	L.S.		

In case of discrepancy between the unit price and the item cost set forth for a unit basis item, the unit price shall prevail and, shall be utilized as the basis for determining the lowest responsive, responsible bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Total Amount" column, then the amount set forth in the "Total Amount" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price. Final payment shall be determined by the Engineer from measured quantities of work performed based upon the unit price.

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

The undersigned agrees that this Bid Form constitutes a firm offer to the District for Bid Schedule 1A, Bid Schedule 1B, Bid Schedule 2A, Bid Schedule 2B, Bid Schedule 3A and Bid Schedule 3B which cannot be withdrawn for the number of calendar days indicated in the Notice Inviting Bids from and after the bid opening, or until a Contract for the Work is fully executed by the District. The District reserves the right to award any and all combinations of Bid Schedule 1A, Bid Schedule 1B, Bid Schedule 2A, Bid Schedule 2B, Bid Schedule 3A and Bid Schedule 3B and/or parts thereof.

The Contract duration shall commence on the date stated in the District's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents. In no case shall the Contractor commence construction prior to the date stated in the District's Notice to Proceed.

Bidder certifies that it is licensed in accordance with the law providing for the registration of Contractors, License No. _____, Expiration Date _____, class of license _____. If the bidder is a joint venture, each member of the joint venture must include the above information.

The undersigned acknowledges receipt, understanding and full consideration of the following addenda to the Contract Documents and information required of bidders.

1. Addenda No. _____ thru _____
2. Information Required of Bidders:
    a. Executed General Information
    b. Executed List of Sub Contractors
    c. Executed Non-Collusion Affidavit form

I hereby certify under penalty of perjury under the laws of the State of California, that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

INFORMATION REQUIRED OF BIDDER

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

GENERAL INFORMATION

The bidder shall furnish the following information. Additional sheets may be attached if necessary.

1. Contractor's Name and Address:

   _____

   _____

   _____

2. Type of Firm: (Check one) Individual ___ Partnership ___ Corporation ___

3. Telephone: _____

4. Contractor's license: Classification _____ No. _____

5. Names and titles of all owners/officers of the firm:

   _____ _____

   _____ _____

   _____ _____

   _____ _____

6. Number of years as a contractor in construction work of this type: _____

7. Answer the three (3) questions below and submit a brief description of the character of the work previously executed as required in the Instructions to Bidders as well as the locations of the major projects, giving the year in which it was done, the manner of its execution, name, telephone number, and address of owner, overall cost when constructed, and such other information as will tend to show ability to prosecute vigorously the work required by this Specification. Attach additional sheets if necessary.

   1. Have you or any of your subcontractors been determined to have committed any serious or willful violations of Part 1 (commencing with Section 6300) of Division 5 of the Labor Code during the past five (5) years? _____ If yes, explain.

   _____

   _____

   _____

   2. What are the most recent workers' compensation experience modification factors for your firm and each of the proposed subcontractors?

   _____

   _____

   _____

3. Have you and each of the proposed subcontractor(s) adopted injury prevention programs under Section 3201.4 or 6401.7 of the California Labor Code?

_____

_____

_____

8. Person who inspected site of the proposed work for your firm:

Name: _____ Date of Inspection: _____

9. Proposed Project Manager

Name: _____

Qualifications: _____

_____

_____

_____

10. NOTE: If required by the Owner, the bidder shall furnish a notarized financial statement, references, resume of superintendent, and other information sufficiently comprehensive to permit an appraisal of his current financial condition.

INFORMATION REQUIRED OF BIDDER

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

LIST OF SUBCONTRACTORS

The bidder shall list below the name and business address of each subcontractor who will perform work under this contract in excess of one-half percent of the total bid price and shall also list the portion of the work which will be done by such subcontractor. After opening proposals, no changes or substitutions will be allowed without the written approval of the Owner.

Aggregate total of all subcontractors shall not exceed fifty percent (50%) of the total contract price.

1. Subcontractor's Name & Address:

   _____

   _____

   Work to be performed:

   _____

2. Subcontractor's Name & Address:

   _____

   _____

   Work to be performed:

   _____

3. Subcontractor's Name & Address:

   _____

   _____

   Work to be performed:

   _____

4. Subcontractor's Name & Address:

_____

_____

Work to be performed:

_____

5. Subcontractor's Name & Address:

_____

_____

Work to be performed:

_____

6. Subcontractor's Name & Address:

_____

_____

Work to be performed:

_____

7. Subcontractor's Name & Address:

_____

_____

Work to be performed:

_____

8. Subcontractor's Name & Address:

_____

_____

Work to be performed:

_____

Note: Attach additional sheets if required.

INFORMATION REQUIRED OF BIDDER

NOBLE CREEK RECHARGE FACILITY PHASE I FENCING

NON-COLLUSION AFFIDAVIT

STATE OF CALIFORNIA

COUNTY OF _____ } NON-COLLUSION AFFIDAVIT

_____, being first duly sworn, deposes and says that
(Name of Affiant)

he/she is _____ of _____
(Title) (Name of Bidder)

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

_____
(Signature)

_____
(Typed Name)

State of _____ }
County of _____ } ss.

Subscribed and sworn to (or affirmed) before me on this _____ day of _____, 20___, by _____, proved to me on the basis of satisfactory evidence to be the person/persons who appeared before me.

(SEAL)

_____
Notary Public

Commission Expires: _____

BEAUMONT-CHERRY VALLEY WATER DISTRICT

NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING

DRAFT CONTRACT FOR PUBLIC WORKS

(CONTRACTOR WILL BE REQUIRED TO EXECUTE CONTRACT)

BEAUMONT-CHERRY VALLEY WATER DISTRICT

CONTRACT FOR PUBLIC WORK

1. Parties and Date

This Contract is entered into this____day of_____, 2020, between the BEAUMONT-CHERRY VALLEY WATER DISTRICT, a California Irrigation (Special) District ("District"), and_____("Contractor"), for the Work described as follows: Noble Creek Recharge Facility Phase I Fencing Project.

2. Consideration

In consideration of the mutual covenants hereinafter contained, District and Contractor agree to comply with the terms of this Contract and to faithfully perform their duties hereunder.

3. Duties of Contractor

3.1 Contractor agrees to furnish all labor, tools, materials and equipment necessary to complete the work hereinafter described. Contractor hereby guarantees that all work to be performed by it hereunder will be performed in a good and workmanlike manner. The Work to be performed by Contractor is described on the Construction Drawings and Specifications included herein attached hereto and by this reference incorporated herein. Pursuant to Public Contract Code Section 3300, Contractor shall possess an active and current Contractor's License, Class A or C-13, which shall be maintained throughout the term of this Contract.

3.2 Contractor shall complete all work required herein on or before **May 29, 2020.**

3.3 Contractor shall furnish District with labor and material releases from all subcontractors performing work on, or furnishing materials for, the job prior to final payment by District.

3.4 **(Section 3.4 Not Required)** ~~Contractor shall furnish a performance bond in the amount of the full contract price, a payment bond in the amount of 50% of the full contract price, and a maintenance bond in the amount of the full contract price issued in forms consistent with industry standards by United States Treasury authorized bonding companies as approved by District, prior to commencement of the Work. Bonds shall be furnished on the forms attached at the back of this Contract, if Additive Bid Item is exercised. Contractor hereby guarantees that all materials and workmanship furnished by him under the Contract will meet fully all requirements thereof as to quality or workmanship and of materials furnished by him. Contractor hereby agrees to replace all materials and pay for all installation costs made necessary by defects in materials or workmanship supplied by him that become evident within twelve (12) months after the date of final payment and to pay for all~~

~~work necessary to remove, restore, and replace the materials to full serviceability and to full compliance with the requirements of the Contract, including the test requirements for any part of the materials furnished hereunder which, during said twelve (12) month period, are found to be deficient with respect to any provision of the Contract. Contractor also agrees and does hereby hold District harmless from claims of any kind which may arise from injury or damage due to said defects. Contractor shall replace all defective materials promptly upon receipt of written orders for same from District. If Contractor fails to replace all defective materials promptly, District may secure the service of others to do this work, and Contractor and his surety shall be liable to District for the cost, including removal and replacement thereof. The guarantees, indemnifications and agreements set forth above shall continue to be secured following completion of the project by Contractor providing a maintenance bond in the amount of 100% of the full contract price on a form commonly used in the industry and acceptable to the District, and for this purpose said bond shall remain in force for a period of one (1) year after the date of the final payment.~~

3.5 Copies of the prevailing rate of per diem wages for each craft, classification or type of worker needed to execute this Contract are available to interested parties upon request. If the total amount of this Contract is $1,000 or more, Contractor agrees to pay such prevailing rates to each workman needed to execute the work required under this Contract and further agrees to comply with the penalty provisions of Section 1775 of the Labor Code in the event of its failure to pay prevailing rates. Pursuant to Section 1727 of the Labor Code, all wages and penalties withheld for failure of Contractor to pay such per diem wages shall be transferred by District to the State Labor Commissioner for disbursement, should Contractor fail to bring suit for recovery within ninety (90) days after completion of the Contract or acceptance of the work.

3.6 Contractor shall pay travel subsistence payments to each workman needed to execute the work, as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed in accordance with Section 1773.8 of the Labor Code.

3.7 When Contractor employs workmen in an apprenticeable craft or trade, Contractor shall comply with the provisions of Section 1777.5 of the Labor Code with respect to the employment of properly registered apprentices upon public works. The primary responsibility for compliance with said section for all apprenticeable occupations shall be with Contractor.

3.8 Contractor is advised that eight (8) hours labor constitutes a legal day's work. Pursuant to Section 1813 of the Labor Code, Contractor shall forfeit a penalty of $25.00 per worker for each day that each worker is permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week, except when payment for overtime is made at not less than one and one-half (1-1/2) times the basic rate for that worker.

3.9 In accordance with the requirements of Labor Code Section 1776, Contractor shall keep accurate payroll records on forms provided by the Division of Labor Standards Enforcement,

or keep payroll records containing the same information required by such forms and shall make any such records available for inspection.

3.10 Contractor shall keep himself fully informed of all laws and regulations in any manner affecting the performance of the Contract work, and shall indemnify District and District's agents against any liability arising from violation of any such law or regulation.

3.11 Contractor shall at its own expense maintain at least the following insurance coverages throughout the performance of this Contract:

(a) Worker's compensation insurance coverages for all persons employed or to be employed in the performance of this Contract, which insurance shall at all times be maintained in strict accordance with the requirements of the current California Worker's Compensation Insurance Laws.

(b) General commercial liability insurance coverage of at least $2,000,000 per occurrence and $2,000,000 general aggregate insuring Contractor and naming District as an additional insured for all claims for bodily injury, personal injury and property damage, arising out of or in connection with any operations under this Contract.

(c) Automobile liability insurance coverage with a limit of liability of $1,000,000 per accident Combined Single Limit.

(d) Course of construction insurance with a limit of liability equal to the full contract amount, unless waived in writing by District.

Prior to commencement of any work under this Contract, Contractor shall obtain and furnish to District a Certificate of Insurance as to each type of insurance required, which certificate shall be on the form provided to Contractor by District.

3.12 Contractor shall be responsible for all loss and damage which may arise out of the nature of the work agreed to herein, or from the action of the elements, or from any unforeseen difficulties which may arise or be encountered in the prosecution of the work until same is fully completed and accepted by District. However, Contractor shall be responsible for damage proximately caused by an act of God within the meaning of Section 4150 of the Government Code only to the extent of five percent (5%) of the contract amount.

3.13 Contractor shall indemnify and hold harmless District, its agents and employees, from and against all claims, damages, losses and expenses, including attorney's fees, arising out of or resulting from performance of work under this Contract and which are attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting therefrom, caused in whole or in part by any negligent or willful act or omission of the Contractor or anyone directly or indirectly employed by him or for whose acts he may be liable.

3.14 Contractor shall be responsible for securing and paying for all permits and licenses necessary to perform the work described herein.

3.15 If the work entails trenching of five (5) feet or more in depth, Contractor shall make adequate provisions for shoring, bracing, sloping, or other protection from the hazard of caving ground.

3.16 As required by Public Contract Code Section 7104, Contractor shall promptly, and prior to disturbance of conditions, notify District of (a) any material discovered in excavation that Contractor believes to be a hazardous waste that is required to be removed to a Class I, Class II, or Class III disposal site; (b) subsurface or latent physical conditions at the site differing from those indicated by District; and (c) unknown physical conditions of an unusual nature at the site, significantly different from those ordinarily encountered in such contract work. Upon notification, District will promptly investigate the conditions to determine whether a change order is appropriate. In the event of a dispute, Contractor shall not be excused from any scheduled completion date but will retain all rights provided by the Contract or by law for resolving the dispute.

4. District's Responsibilities

4.1 As consideration for performance of the work required herein, District agrees to pay Contractor the total contract amount of **_____, ($_____)**, provided that such amount shall be subject to adjustment pursuant to written change orders signed in advance by District.

4.2 Contractor shall submit progress payment invoices to District at the end of each calendar month during the term of the Contract. All progress payment invoices shall be subject to approval by the District prior to payment by the District. Such progress payment invoices shall be made in accordance with Section 20104.50 of the California Public Contract Code, requiring District to make a determination of suitability of the payment request within seven (7) days of receipt of such request and further requiring District to make payment on properly submitted progress payment invoices within thirty (30) days in order to avoid interest payments to the Contractor upon such amounts.

4.3 When the Contractor determines that he has completed the work required herein, Contractor shall so notify District in writing and shall furnish all labor and material releases required by Section 3.3 of this Contract. District shall thereupon inspect the work and, if acceptable, shall pay to Contractor the contract price, less any amount which District may be authorized or directed by law to retain. Payment of retention proceeds due to Contractor shall be made no later than sixty (60) calendar days after such final acceptance by District, in accordance with Section 7107 of the California Public Contract Code. Contractor is hereby alerted to provisions of Section 7107 of the California Public Contract Code, requiring Contractor to pay each of its subcontractors from whom retention has been withheld, each subcontractor's share of the retention received, within ten (10) calendar days from the time that all or any portion of such retention proceeds are received by Contractor from District. District will allow Contractor to substitute qualified securities, deposited with District or a qualified escrow agent, in lieu of contract retentions in accordance with provisions of California Public Contract Code, Section 22300. The escrow agreement used in such instance shall be substantially similar to that

form set out in Section 22300 of the Public Contract Code. District will provide this form to the Contractor upon request.

4.4 To the extent required by Section 4215 of the Government Code, District shall compensate Contractor for the costs of locating and repairing damage to underground utility facilities not due to the failure of Contractor to exercise reasonable care, and removing or relocating underground utility facilities not indicated in the construction drawings and for equipment necessarily idled during such work. Contractor shall not be assessed liquidated damages for delay caused by failure of District to provide for removal or relocation of such utility facilities.

5. Contractual Relationship

It is expressly agreed that Contractor is an independent contractor, and neither Contractor nor any of its employees shall be deemed employees of District. Contractor shall have full supervision over all workers on the job, including equipment, drivers, and operators, and neither District nor any of District's agents shall be held responsible for any action of Contractor under this Contract. Should any question arise regarding the meaning or import of any of the provisions of this Contract or written or oral instructions from District, the matter shall be referred to District's General Manager, whose decision shall be binding upon Contractor.

6. Assignment Forbidden

Contractor shall not assign or transfer this Contract or any right, title or interest herein without the prior written consent of District. If contractor attempts an assignment of this Contract or any right or interest herein, District may, at its option, terminate and revoke the Contract and shall thereupon be relieved from any and all obligations to Contractor or his assignee or transferee.

7. Time of Essence

Time is of the essence in the performance of this Contract. Contractor will be assessed liquidated damages in the amount of $100.00 per calendar day for each day of unauthorized delay in completing performance.

8. Termination

This Contract may be terminated by District at any time by giving Contractor seven (7) days advance written notice. In the event of termination by District for any reason other than the fault of the Contractor, District shall pay Contractor for all work performed up to that time as provided herein. In the event of breach of the Contract by Contractor, District may terminate the Contract immediately without notice, may reduce payment to the Contractor in the amount necessary to offset District's resulting damages, and may pursue any other available recourse against Contractor.

9. Dispute Resolution

Any separate demand by Contractor for the payment of money or damages shall be resolved in accordance with Public Contract Code Sections 20104 et seq., if they apply. Copies of those sections are available upon request and by this reference are incorporated herein.

10. Attorney's Fees and Costs

If any action is necessary to enforce or interpret the terms of this Contract, the prevailing party shall be entitled to recover from the losing party attorney's fees in an amount determined to be reasonable by the court, together with costs and necessary disbursements.

11. Notices

Any notice required to be given under the terms of this Contract shall be sufficient and complete upon depositing the same in the United States mail, with postage prepaid and addressed as follows:

DISTRICT	**Contractor**
Beaumont-Cherry Valley Water District P.O. Box 2037 560 Magnolia Avenue Beaumont, CA 9223	_____ _____ _____ _____ _____

12. Counterparts

This Contract shall be executed in two (2) counterparts, each of which shall constitute an original.

13. Certification of License

Contractor certifies that as of the date of execution of this contract, Contractor has a current contractor's license of the classification indicated below Contractor's signature hereto.

IN WITNESS WHEREOF, each of the parties has caused this Contract to be executed on the day and year first above written.

ATTEST:

_____
(Contractor)

By: _____

_____
Secretary

Title: _____

_____
Contractor's License Number & Classification

BEAUMONT-CHERRY VALLEY WATER DISTRICT

ATTEST:

By:

_____
Daniel K. Jaggers
General Manager

_____
Lona Williams
Secretary to the Board

CERTIFICATION

LABOR CODE – SECTION 1861

I, the undersigned Contractor, am aware of the provisions of Section 3700 et seq. of the Labor Code which requires every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of the Code, and I, the undersigned Contractor, agree to and will comply with such provisions before commencing the performance of the work of this Contract.

_____
Contractor

By: _____

Title: _____

BEAUMONT-CHERRY VALLEY WATER DISTRICT

NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING

SPECIAL REQUIREMENTS

BEAUMONT-CHERRY VALLEY WATER DISTRICT
NOBLE CREEK RECHARGE FACILITY PHASE 1 FENCING PROJECT
SPECIAL REQUIREMENTS

These Special Requirements set forth requirements for work related to the installation of new site security fencing for the Beaumont-Cherry Valley Water District's Noble Creek Recharge Facility Phase 1 as set forth on the attached Proposal Bidding Schedules 1A through 3B (6 in total) and the associated Project Drawings and Project Specifications. The District's Noble Creek Recharge Facilities Phase I project located at the southeast corner of Beaumont Avenue and Cherry Valley Boulevard within the Beaumont area and specifically located within the Community of Cherry Valley, County of Riverside, CA.

Furnish and install fencing materials and appurtenances as set forth on the attached Proposal Bidding Schedules, The District is interested in selecting one of three fencing options as set forth in the Bid Schedules with each fence option being provided in either six foot or eight foot fence height as set forth on Table 1, below:

TABLE 1
DESCRIPTION OF FENCING MATERIALS AND APPURTENANCE OPTIONS

Bid Schedule	Description	Nominal Fence Height (ft)
1A	Galvanized Fence, Gates and Appurtenances	6' – 0"
1B	Galvanized Fence, Gates and Appurtenances	8' – 0"
2A	Extruded Polymer Fence, Gates and Appurtenances	6' – 0"
2B	Extruded Polymer Fence, Gates and Appurtenances	8' – 0"
3A	Fused Polymer Fence, Gates and Appurtenances	6' – 0"
3B	Fused Polymer Fence, Gates and Appurtenances	8' – 0"

All bid items shall include all price components including but not limited to materials cost, cost of installation, and any applicable sales tax.

SR-01 Contract Documents, Specifications, and Drawings The Contractor shall recognize and acknowledge the condition that Bid Schedule 1A, 1B, 2A, 2B, 3A, and 3B shall include all work activities necessary to install the new fencing, gates, and all appurtenances identified on the Contract Plans and Specifications and there will be no additional compensation from the Owner for the completion of said work.

SR-02 District Specifications Work shall be completed in accordance with the Beaumont-Cherry Valley Water District Technical Specifications are included at the back of this specification and are listed as follows:

Specification No.	Title
01000	General Requirements
01300	Contractor Submittals and Requests Technical Specifications
02300	Earthwork
02444	Chain Link Fence and Gates
03300	Basic Concrete Technical Specifications

SR-03 Contract Drawings

The following Beaumont-Cherry Valley Water District Drawings are made a part of these Contract Documents:

Beaumont-Cherry Valley Water District Construction Drawings (24" x 36")
Titled: Fencing Plan for Noble Creek Recharge Facility Phase I

Title	Sheet No.
Title, Vicinity Map, Sheet Index, Legend Construction Notes	1
Area 1 Fencing Plan	2
Area 2 Fencing Plan	3

SR-04 Special Work Requirements At the end of every workday, the Contractor shall completely backfill and compact all excavations and/or trenches. No excavations or trenches shall be left open after work hours without special approval of the District.

The alignment of the proposed fencing for the Noble Creek Recharge Facilities Fencing Project is approximately the same fence line alignment as the existing white plastic split rail fence system located on the westerly edge of the Phase I Recharge Facility Site. District staff will remove said existing white plastic fence system and backfill existing fencing system foundation holes with sand in advance of the fencing Contractor commencing work.

SR-05 Scope of Work Under these Specifications the Contractor shall furnish all materials, labor and equipment to complete Construction of the Noble Creek Recharge Facility Phase I Fencing Project in accordance with the Contract Documents (plans and specifications).

SR-06 Reference to District's Technical Specifications Any and all referenced "District attached Technical Specifications shall be considered part of the contract drawings and specifications. The Contractor shall not be entitled to any additional compensation due to work required under said Technical Specifications.

SR-07 Coordination The Contractor should take note that other work may be taking place simultaneously at the jobsite as part of the District's ongoing Operations and Maintenance Program. It shall be the Contractor's responsibility to coordinate his activities with all District Staff and/or other contractors performing work in the project area and to cooperate with District Staff and/or all other contractors within reasonable and professional norms so that all construction may be completed in a timely manner. In the event a scheduling conflict arises between District Staff or contractors performing work on the job site and if both parties are unable to reach an agreement, the District shall be the final authority in resolving said scheduling conflict. No additional compensation will be allowed due to conflicts with other construction in the area.

SR-08 Existing Underground Irrigation and Utilities and Potholing for Existing Utilities Unless otherwise indicated on the plans or directly by the utility owner, all existing irrigation and utilities shall be protected in place and service maintained as part of the project work. The existing and proposed fence line alignments are plotted on the plan view of the plans. Contractor shall notify USA (Dig alert) of identified project area, and pothole all existing utilities and points of connection, and protect in place all existing irrigation system components and utilities affected by the proposed fence installations.

The Contractor is responsible for performing exploratory excavations (potholing) along the

alignment of the project that may be necessary to confirm location of existing irrigation facilities and/or existing utilities. **The Contractor is hereby granted permission to use vacuum excavation on BCVWD facilities. Vacuum excavations may not be used on any other facilities unless written permission is obtained from the owner of the facility in accordance with State Law 4216.** All associated costs with potholing shall be included in the unit bid price of the fence system installation and no additional compensation will be allowed.

SR-09 Preservation of Existing Improvements, Restoration of Work Site and Disposal of Spoil and Waste Materials

A. Contractor shall perform his operations so that existing improvements are not damaged. Contractor shall repair and restore any disturbed or damaged private or public improvements, which results from his operations (except that which is specifically a part of the Contract Work) to the satisfaction of the District, or the agency having jurisdiction over said improvements, all at the Contractor's expense.

B. All work sites shall be restored to pre-job conditions and shall meet the requirements of the District and property owner.

C. Contractor shall be responsible for the proper disposal of all waste materials resulting from his operations, including rubbish, packaging materials, discarded equipment parts, and damaged construction materials, in a manner and at locations suitable to the District and all health and other regulatory agencies.

SR-10 Records of Construction Contractor shall keep and maintain, at the job site, one record set of Construction Drawings.

SR-11 Local Conditions The Contractor shall assess, by personal investigation, local conditions affecting the work. Neither the information contained in this section nor that derived from any maps or plats, or from the District or employees shall act to relieve the Contractor of any responsibility herein or from fulfilling any and all of the terms and requirements of this Contract.

Nuisance water, such as rainfall, irrigation water, or local surface runoff may occur within construction areas during the period of construction under this Contract. The Contractor, by submitting his bid, will be held responsible for having investigated the risks arising from such water and shall take all due measures to prevent delays in progress of the work caused by such waters. All costs associated with coordination of work with regards to local conditions, including nuisance water, shall be included in the bid and no additional compensation will be allowed.

The cost of this Work, including permits and retention of licensed subcontractors, shall be included in the appropriate bid item and no additional compensation will be allowed.

BEAUMONT-CHERRY VALLEY WATER DISTRICT

NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING

BASIC/TECHNICAL SPECIFICATIONS

SECTION 01000
GENERAL REQUIREMENTS

1. Definitions

Whenever the terms herein defined occur in these Specifications or other related documents, they shall have the meanings here given.

a. "District" or "Owner" shall mean the BEAUMONT-CHERRY VALLEY WATER DISTRICT 560 Magnolia Avenue, Beaumont, CA 92223, its Manager, and any other person or persons designated by the Owner to act on its behalf.

b. "Manager" shall mean the person designated by the Board of Directors of the BEAUMONT-CHERRY VALLEY WATER DISTRICT to have charge, supervision, and administration of said Owner.

c. "Contractor" shall mean the person, firm, or corporation responsible for the construction of facilities and improvements or any portions thereof to be integrated into Owner's facilities, either on behalf of the Owner or on behalf of a Developer.

Contractor shall at all times be represented on the Work in person or by a duly designated agent or superintendent. Contractor shall hold a valid Contractor's License in accordance with the provisions of Division 3, Chapter 9 of the Business and Professions Code of the State of California, and any amendments thereto.

d. "Work" shall mean all Work to be performed by Contractor and shall be as specified by these Specifications and the Construction Drawings, Special Requirements, and Specific Directions for any particular project.

The Owner may at any time during Work, by written order, make such changes as found necessary in the character, quality, or quantity of the Work to be furnished.

e. "Construction Drawings" shall mean those drawings approved by the Owner showing dimensions, details, features, and requirements of the Work. Said Construction Drawings shall be used in conjunction with Special Requirements or Specific Directions and shall be augmented by these Specifications and the Standard Drawings.

f. "Special Requirements" shall mean those requirements describing Work not specified by Construction Drawings or Specific Directions, clarifying Work as shown by Construction Drawings or as described by Specific Directions, or supplementing or modifying these Specifications. Said requirements may be written or verbal.

g. "Specific Directions" shall mean those instructions of the Owner supplementing or modifying the Construction Drawings, Special Requirements, and Specifications and shall include all Work not specified by Construction Drawings or Special Requirements. Said instructions may be written or verbal.

h. "Specifications", also "Construction Specifications", shall mean the requirements contained herein and shall apply to all Work, where applicable, unless specified otherwise, in the Construction Drawings, Special Requirements, or Specific Directions. Said Specifications shall augment Construction Drawings, Special Requirements, or Specific Directions and shall pertain to all methods and materials of construction.

i. "Standard Drawings" shall mean all drawings referenced as such and bound with the Specifications. Said Standard Drawings shall be considered an integral part of the Specifications.

j. "Standard Specifications" shall mean the Standard Specifications for Public Works Construction, latest edition, as published by Building News, Inc, Los Angeles, California. The Standard Specifications shall augment, not supersede, the "Construction Specifications". As used herein, the Standard Specifications shall not apply to measurement, payment, schedule, delays, or extra work.

2. Abbreviations

Whenever used in these Specifications, the following abbreviations shall refer to the agency shown:

a.	AASHTO	American Association of State Highway and Transportation Officials
b.	ACI	American Concrete Institute
c.	AISC	American Institute of Steel Construction
d.	AISI	American Iron and Steel Institute
e.	ANSI	American National Standards Institute
f.	API	American Petroleum Institute
g.	ASTM	American Society for Testing Materials
h.	AWWA	American Water Works Association
i.	AWS	American Welding Society
j.	CRSI	Concrete Reinforcement and Steel Institute
k.	DIPRA	Ductile Iron Pipe Research Institute
l.	EIA	Electronic Industries Association
m.	IEEE	Institute of Electrical and Electronic Engineers
n.	IPCEA	Insulated Power Cable Engineers' Association
o.	NBFU	National Board of Fire Underwriters
p.	NEC	National Electrical Code
q.	NEMA	National Electrical Manufacturing Association
r.	REA	Rural Electrification Administration
s.	SSPC	Steel Structures Painting Council
t.	UL	Underwriters' Laboratories

All references to Specifications of any of the above agencies shall mean the latest editions thereof.

3. Permits, Certificates, Laws, and Ordinances

Unless specified otherwise, Contractor shall at no cost to the Owner obtain all necessary permits, certificates, and licenses from such Federal, State, and local agencies as required to perform the Work. Contractor shall comply with all laws, ordinances, or rules and regulations of said agencies in performance of the Work.

4. Contractor's Liability

Contractor shall be responsible, and the Owner shall not be answerable or accountable in any manner, for any loss or damage that may happen to the Work performed by Contractor, subcontractors, or those associated with or working under Contractor, or for any of materials or equipment used or employed in performing the Work, or for injury to any person or persons, including employees, the public, or others, or for damage to property from any cause which might have been prevented by Contractor, subcontractors, or those associated with or working under Contractor. Contractor having control over such Work must properly guard and does indemnify and hold the Owner harmless, and will defend the Owner therefrom at Contractor's own expense, against all injuries or damages to persons and property.

Contractor shall indemnify, defend, and hold the Owner harmless from any and all claims, demands, fines, and penalties imposed or levied by any Federal, State, or local agency associated with or related to the taking (as defined by the United States Fish and Wildlife Service and, or the California Department of Fish and Game) of any protected animal or plant species or habitat by Contractor, subcontractors, or those associated with or working under Contractor.

5. Interferences

Any and all crossings of public utility facilities such as water mains, sewer lines, gas lines, electrical or control cables and/or conduits, telephone and/or telegraph cables and/or conduits shall be made by Contractor in accordance with requirements and Specifications of appropriate agencies. Contractor shall obtain any necessary permits, licenses, and/or agreements required by said agencies.

Whenever facilities are encountered by Contractor, he shall ascertain the ownership thereof and shall make all necessary arrangements with the owners for the protection, removal, relocation, and/or replacement thereof. Contractor shall give the owners due notice of his requirements and shall give them convenient access and cooperate with them in every way while any work of removal and/or replacement is being performed.

6. Sanitation

All parts of the Work shall be maintained in a neat, clean, sanitary condition. A portable toilet, inaccessible to insects, shall be provided by the District wherever needed for use by the Contractor's employees and said toilet's use shall be strictly enforced. All waste and refuse from sanitary facilities shall be disposed of by the District. All waste and refuse from any source related to Contractor's operations shall be disposed of in a sanitary manner satisfactory to the Owner and in accordance with laws and regulations pertaining thereto. Contractor shall rigorously prohibit and prevent committing of nuisance within the Work area or upon the Owner's right-of-way or adjacent private property.

7. Accident Prevention and First Aid

Contractor shall provide a safe working environment for all persons working on or affected by the Work. Contractor shall take precautions for the protection of persons and property at all times during the course of the Work. Contractor shall exercise and observe the safety provisions of applicable laws and building and construction codes. Contractor shall maintain in good and safe operating condition all equipment and facilities required for proper execution and inspection of the Work.

Contractor shall guard machinery, equipment, and hazards in accordance with safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, the Construction Safety Orders and Trench Construction Safety Orders as issued by the Division of Industrial Safety of the Department of Industrial relations of the State of California, and Chapter 8 ("Traffic Control and Protection of Workmen") of the Manual of Instruction for the Maintenance Department of the State of California Department of Transportation, to the extent that such provisions are not inconsistent with applicable laws or regulations.

All warning signs, lights, barricades, and other measures designed to protect the traveling public shall be erected and maintained in good order by Contractor in accordance with applicable provisions of Chapter 21 ("Maintenance Signs, Barricades, and Traffic Control") of the Manual of Instruction for the Maintenance Department of the State of California Department of Transportation and of the applicable ordinances of the public agency having jurisdiction over the maintenance and policing of highways, thoroughfares, and streets. Special regard shall be given to the rights and convenience of the traveling public and the property owners and residents in the area of Work. Cross-over boards or steel plates approved by the Owner shall be placed and other precautions taken whenever necessary to provide for at least one-way traffic along all traveled streets and to provide access to driveways and residences, unless specified otherwise.

8. First Aid Facilities

Contractor shall keep first aid facilities and supplies on the jobsite. Contractor shall provide instruction in first aid as required by State regulations. Contractor shall provide emergency first aid treatment and supplies for his employees sufficient to comply with all applicable laws.

9. Heat Illness Prevention Plan

In hot environments, Contractor shall comply with the California Code of Regulations Title 8, Section 3396, Heat Illness Prevention and shall refer to BCVWD Heat Illness Prevention Program and implement proper procedures to protect Contractors employees and Sub-Contractor employees from over exposure.

10. Materials

If required by the Contract Documents, Contractor shall furnish only approved materials as listed in the Owner's Contract Documents and/or "District Standards for furnishing of Materials and Construction of Water and Recycled Water Facilities and Preparation of Water System Plans". All materials to be furnished by Contractor shall be new and of the best quality for their intended use. All like materials shall be of one manufacture for any particular project.

If required, the Contractor shall submit 3 copies of all material lists to the Owner for approval thereof. Said material lists shall include manufacturer's name, designation, description, and related information of all materials to be furnished and installed or otherwise used by Contractor in the performance of the Work. Said material lists shall be submitted at or prior to project preconstruction meeting and said lists shall be approved by the Owner prior to beginning construction.

11. Construction

Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, equipment, appliances, and methods and for any damage which may result from their failure or their improper construction, maintenance, or operation.

Contractor shall be responsible for examining all Construction Drawings, Specifications, Standard Drawings, Work site, delivery routes, and local conditions which may affect the Work.

Before proceeding with the Work, Contractor shall furnish the Owner any information required of him by the Construction Drawings, Specifications, Standard Drawings, Special Requirements, and Directions of the Owner.

Contractor shall keep at jobsite a complete set of Construction Drawings, Specifications, Standard Drawings, permits, certificates and licenses for the Work, and all other data required by the Owner. Contractor shall be responsible for checking all dimensions and quantities on said drawings or schedules and shall notify the Owner of any errors and omissions found.

Until acceptance of the Work by the Owner, Contractor shall bear the risk of injury or damage to any part of the Work by action of the elements or from any other cause and Contractor shall rebuild, repair, restore, and make good any injuries or damages to the Work.

Contractor shall cooperate with other contractors who are working in the project area on behalf of other public entities and the City of Beaumont as the Owner may specify and he shall comply with all orders of the Owner. Contractor shall employ only competent and skillful persons to perform the Work. Said persons shall be qualified or certified to perform the Work in accordance with requirements of said person's trade.

Contractor shall submit to the Owner for approval a construction schedule covering all Work based on normal work periods. Contractor shall not deviate from approved schedule without prior permission from the Owner. Whenever Contractor arranges to work at night or at any time other than normal work periods or to vary the period during which Work is to be carried on each day, he shall obtain special permission

from the Owner to do so and he shall keep the Owner properly informed of his activities. Construction schedule shall show the order in which Contractor proposes to carry out Work, dates of anticipated commencement and completion of Work and salient components thereof, and estimated percentage of Work to be completed at any time during the construction period.

12. Records of Construction

Contractor shall maintain at least one complete set of Construction Drawings on the jobsite during the course of construction upon which he shall note any changes in the Work as they occur. Contractor shall maintain said Drawings so that the Owner may at any time during the course of construction ascertain the changes that have occurred. Said Construction Drawings shall be the basis of the two sets of record drawings that Contractor shall provide the Owner upon completion of the Work.

13. Inspection

All materials and equipment furnished and all Work performed shall be subject to rigid inspection by the Owner. Contractor may be required to remove and replace under proper inspection any Work performed in the absence of prescribed inspection, with the entire cost being borne by Contractor irrespective of whether such Work is found to be defective. Work covered up without authority of the Owner shall, upon order of the Owner, be uncovered to the extent required to permit inspection, repair, or replacement and thereafter be recovered, and Contractor shall bear entire cost.

14. Examination of Work

Contractor shall furnish the Owner every reasonable facility for ascertaining whether Work is being accomplished in accordance with the requirements and intention of the Construction Drawings, Specifications, Standard Drawings, Special Requirements, and Directions of the Owner.

15. Right to Occupy Work

The Owner may wish to occupy or place in service portions of the Work before its final completion and shall be at liberty to do so. Such occupancy or placing in service of any portion of the Work shall not relieve Contractor of his responsibility of protection and care of all Work until final completion and acceptance provided, however, that expense directly attributable to operation and placing portions of Work in service shall not be chargeable to Contractor.

16. Maintenance and Guarantee

Contractor shall guarantee that all Work performed by him meets all requirements specified as to character, quality, and quantity of materials and workmanship. Contractor shall replace all materials and pay all installation costs made necessary by defects of workmanship supplied by him that become evident within one year after acceptance of the facilities or the date of final payment, whichever occurs later.

Contractor shall replace all defective materials if said materials are related to defects in the Contractor's workmanship promptly upon receipt of written notice from the Owner. If Contractor fails to replace all defective materials promptly, the Owner may secure the service of others to perform the Work and Contractor shall be liable to the Owner for any costs including removal and replacement thereof.

17. Construction Power

Contractor shall provide all necessary power required for his operations, and shall provide and maintain in good order such modern power equipment and installation as shall be adequate, in the opinion of the Owner, to perform the required Work in a safe and satisfactory manner.

18. Construction Water

Unless specified otherwise, the Owner will provide construction water to Contractor from its existing system at no charge. Contractor shall furnish and install all necessary piping and appurtenances necessary to convey water from the Owner's metered service connection to place of use.

19. Welding

Welding shall be done by the electric arc method using a process which excludes the atmosphere from the molten metal, except where otherwise approved by the Owner. Welding electrodes used for manual welding shall be an approved type. Except as modified herein, welding process qualification and operator qualification shall comply with the applicable requirements of the "Code for Arc and Gas Welding in Building Construction" of the AWS.

Each weld shall be uniform in width and size throughout its entire length. Each layer shall be smooth, free from slag, cracks, pinholes, and undercut and shall be completely fused to adjacent weld beads and base metal. Cover pass shall be completely free of course ripples, irregular surfaces, non-uniform bead pattern, high crown, deep ridges, or valleys between beads, and shall blend smoothly and gradually into surface of base metal. Butt welds shall be slightly convex, of uniform height, and shall have full penetration. Fillet welds shall be of size indicated, with full throat, and with each leg of equal length. Repair, chipping, or grinding of welds shall not gouge, groove, or reduce base metal thickness.

20. Environmental Factors

Contractor shall take all reasonable precautions to protect the environment.

a. Air Pollution

Contractor shall use only machinery and equipment which is equipped with suitable air pollution control devices so that undue quantities of pollutants are not added to the atmosphere in the vicinity of the Work site. Contractor's equipment shall meet all Federal, State, and local requirements for air quality emissions and Contractor shall comply with all applicable Federal, State, and local air pollution control regulations.

Contractor shall also take all necessary precautions to control dust created by construction operations. Contractor shall be especially diligent in implementing his dust control program and he shall be prepared to respond immediately and positively to any instructions for corrective action given by the Owner. Contractor shall use dust palliatives if necessary to satisfactorily control dust; however, Contractor shall secure the Owner's approval for use of dust palliatives other than water.

b. Explosives

Contractor shall handle, transport, store, and use explosives in accordance with applicable Federal, State, and local laws and regulations. Contractor shall be responsible for and make good any damage caused by his use of explosives.

c. Fires

Contractor shall exercise all precautions necessary to prevent unauthorized fires within or adjacent to the limits of the Work. Contractor shall be responsible for all damage resulting from fire due directly or indirectly to his or his employees' activities or the activities of his subcontractors or their employees.

d. Drainage and Flooding

Contractor shall manage excavation and spoil banks such that existing drainage conditions are not impaired. Contractor shall provide drainage in all cases where the existing drainage conditions are

being unavoidably altered or disturbed by his operations. Temporary diversions, ditches, checks, swales, or other drainage structures or features necessary to ensure proper drainage and flood control shall be provided by Contractor at no extra cost to the Owner.

e. Historical and Archaeological Sites

If Contractor should encounter any evidence of historical or archaeological significance, he shall immediately cease construction, notify the Owner, and refrain from any activity until the Owner orders Work to resume. The Owner will assume full responsibility for any delays caused by historical or archaeological investigations.

f. Noise Pollution

Contractor shall equip all machinery and equipment used for construction with noise control devices such as mufflers for internal combustion engines or other suitable noise suppressors. Noise produced by construction operations shall be kept to a minimum and shall be consistent with reasonable human health requirements considering time of day and location of Work site. Contractor shall comply with all applicable Federal, State, and local noise pollution control regulations.

Unless specified otherwise, noise levels in connection with the Work shall not exceed 75 dB(A) at a distance of one hundred (100) feet for relatively continuous exposure and they shall not exceed 90 dB(A) at that same distance for relatively infrequent intermittent exposure. Contractor shall be prepared to respond immediately and positively to any instructions for corrective action given by the Owner particularly with respect to complaints from the public.

g. Public Relations

Contractor shall give due consideration to the comfort and convenience of the public and he shall instruct his employees to be polite and respectful in their dealings with the public at the Work site and in traveling to and from the Work site.

h. Traffic

Contractor shall adequately protect the public using any roads which are involved in Contractor's operations and he shall maintain safe traffic flow in the vicinity of the Work. Contractor shall use signs, barricades, delineators, flashers, and flagmen, all in strict compliance with Federal, State, and local rules and regulations regarding traffic control. Public roadways shall not be barricaded or blockaded except in accordance with requirements of public agencies having jurisdiction over same. Contractor shall provide access to all walkways, sidewalks, driveways, and streets at all times. Contractor shall implement traffic control plan provided by the Owner for the Work, and Contractor shall modify said traffic control plan, if required to provide a safe work space.

i. Vegetation and Wildlife

Contractor shall not destroy or disturb any vegetation or habitat unless absolutely necessary for the performance of the Work. Contractor shall take all steps necessary to ensure that his employees do not destroy or disturb any vegetation or wildlife in the prosecution of the Work or incidental thereto, including travel to and from the Work site.

j. Water Pollution

Contractor shall discard materials which might adversely affect ground or surface water at approved dump sites only. Chemicals and other water pollutants shall not be discharged into natural watercourses or on land tributary to said watercourses. Contractor shall comply with all applicable Federal, State, and local water pollution control regulations.

k. Cleanup

Contractor shall keep the premises occupied by him in a neat, clean condition free from unsightly accumulation of rubbish. Contractor shall maintain all Work areas within or without the project limits free from dust which would cause a hazard to the Work, operations of other contractors, or other persons or property. Upon completion of the Work, Contractor shall at his own expense satisfactorily dispose of or remove from the vicinity of the Work all plants, building, rubbish, unused materials, concrete forms, and other equipment and materials belonging to him or used under his direction during construction and, if he fails to do so, the same may be removed and disposed of by the Owner at Contractor's expense.

SECTION 01300
CONTRACTOR SUBMITTALS AND REQUESTS
TECHNICAL SPECIFICATIONS

PART 1 - GENERAL

1.01 Description

This Section covers requirements for submittals and forms a part of all other Sections in which submittals are specified or required. This Section also covers Contractor's Requests for Information and Requests for Change.

Submittal Requirements Included in this Section

A. Contractor's Construction Schedule
B. Shop Drawings
C. Material Samples
D. Operation and Maintenance Manuals
E. Requests for Substitutions or Equals
F. Record Drawings

Contractor Requests Included in this Section

A. Requests for Information
B. Requests for Change

In addition to submittal requirement set forth in Sections 1.02 through 1.09, hereafter, Contractor shall include submission in electronic media format as set forth in Section 1.10.

1.02 CPM Progress Schedule

Contractor shall submit to Owner a CPM progress schedule to demonstrate the Contractor is sequencing work activities in accordance with the Contract Documents constraints and to assist the Owner in planning the Owner's inspection and operation activities.

A. Within thirty (30) days of Notice to Proceed (or within forty five (45) days of Notice of Award), Contractor shall submit a Critical Path Method (CPM) analysis for construction progress control, prepared on 11" x 17" charts. All construction activities and procurement shall be indicated in a time scaled format and a calendar shall be shown on all sheets along the entire sheet length. Each activity arrow or node shall be plotted so that the beginning and ending dates of said activity can be determined graphically by comparison with the calendar scale. All activities shall be shown using the symbols that clearly distinguish between critical path activities, non-critical activities, and free float for each non-critical activity. All non-critical path activities shall show estimated performance time and free float time in scaled form.

B. The duration estimate indicated for each activity shall be computed in working days and shall be shown on the construction schedule in calendar days. It shall represent the single best estimate considering the scope of the work and resources planned for the activity. Except for certain non-labor activities, such as curing concrete or delivering materials, activity duration shall not exceed ten (10) working days (fourteen (14) calendar days), nor be less than one (1) working day unless otherwise accepted by Owner.

C. Contractor shall revise and resubmit the CPM progress schedule monthly, flagging all slippages and missed mile posts. Contractor shall attach a narrative description of proposed corrective actions to the resubmitted CPM progress schedule, including the following minimum information for each activity and critical path item:

1. Date of initial shop drawing submittal, as applicable.
2. Engineers time for review of shop drawings.
3. Ordering dates for long lead time items.
4. Dates for materials onsite.
5. Early start work dates.
6. Early finish work dates.
7. Late start work dates.
8. Late finish work dates.
9. Date of initial submittal of operation and maintenance manuals.
10. Date of final submittal of operation and maintenance manuals.
11. Testing and cleanup.
12. Final completion.

Contractor shall modify any portions of the construction schedule that become infeasible due to activities behind schedule or for any other valid reason. Any activity that cannot be completed by its original latest completion date shall be deemed to be behind schedule.

D. The CPM progress schedule must be submitted to the Owner before the monthly progress payment is made. Scheduling and completion of the project in a timely manner and per Contract completion time, is solely the Contractor's responsibility. The CPM schedules submitted to the Owner shall not modify or revise any Contract provisions presented in the Contract Documents.

E. Although the Owner may provide commentary relative to the Contractor's CPM schedule, the schedule (and related schedule updates) will not be "approved". The Owner will utilize the Contractor's schedules strictly for scheduling of necessary inspection and operations staff and for identifying any apparent conflicts, errors, or misunderstandings of Contract Document requirements by Contractor.

F. The scheduling and work progress is the total responsibility of the Contractor, and work shall be performed to meet the Contract Completion Times or Dates specified in the Contract Documents.

1.03 Shop Drawing Submittal

A. Unless otherwise specified in the Contract Documents, Contractor shall furnish for all equipment and materials to be furnished and installed for the project at least six (6) copies of each shop drawing for Owner's review and approval. Up to four (4) copies will be retained for Owner's use, and the remaining copies will be returned to Contractor.

The term "Shop Drawings" as used herein shall be understood to include all data covering all equipment, equipment components, fabricated materials, and furnished materials.

Data shall include, but shall not be limited to, design calculations, equipment drawings, fabrication and installation drawings, erection drawings, mix designs, operating instructions, catalog sheets, data sheets, lists, graphs, and similar items. Data shall demonstrate full compliance with the Contract Documents.

Contractor shall submit shop drawings in a timely manner. Contractor shall allow sufficient time for Owner's review and approval of shop drawings. Contractor shall be responsible for any project delays resulting from late submittal of initial shop drawings or resubmittal of corrected or revised shop drawings.

B. Method of Submittal

Contractor shall deliver shop drawings submittals by means of dated, signed, and sequence numbered transmittals on Contractor's letterhead. Contractor shall clearly describe the submittal contents, identifying whether initial or subsequent submittals and stating the drawing numbers and specification sections, articles, and paragraphs to which the shop drawings pertain. All data sheets, catalog cuts, or drawings showing more than the particular item under consideration shall be clearly marked to delete all but the applicable information. All data sheets, catalog cuts, or drawings shall be clearly marked to delineate all proposed material and/or equipment options and accessories.

C. Deviations or Exceptions from Contract Documents

Where proposed equipment or materials, equipment components, equipment functions, or equipment operations deviate from the specifications and whenever exceptions to the specifications are taken, it shall be clearly noted on the shop drawing submittals. Deviations shall include references to the specific sections, parts, and paragraphs or drawing numbers and notes for which the deviations or exceptions are made.

D. Contractor's Review

All shop drawing submittals shall be carefully reviewed by Contractor prior to submission to Owner. Contractor shall indicate by a signed and dated stamp on the submittal that Contractor has checked the shop drawings as being correct and in strict conformance with the Contract Documents. When applicable, Instrumentation Subcontractor is also required to indicate by a signed and dated stamp on the submittal that Instrumentation Subcontractor has checked the shop drawings as being correct and in strict conformance with the Contract Documents. Shop drawings not so reviewed by Contractor (or Instrumentation Subcontractor, if applicable) may be returned without action taken by Owner, and any delays caused thereby shall be the responsibility of the Contractor.

During Contractor's review of shop drawings, Contractor is expected to thoroughly review all applicable portions of the Contract Documents for which shop drawings apply. This includes cross checking: General Drawings, Civil Drawings, Mechanical Drawings, Structural Drawings, Electrical/Instrumentation Drawings, Architectural Drawings, Landscape/Irrigation Drawings, and all applicable portions of the Specifications. Contractor shall bring any conflicts, errors, or apparent omissions to Owner's attention in writing during the shop drawing submittal process. If Contractor fails to bring conflicts, errors, or apparent omissions to Owner's attention during the shop drawing submittal process, Contractor may be required to remove and reconstruct completed work or perform corrective work at Contractor's expense (all as determined by Owner).

E. Owner's Review

1. Owner's review of the shop drawings submitted by Contractor will cover only general conformity to the Contract Documents. The review of shop drawings shall not relieve Contractor of full responsibility for any deviation from the requirements of the Contract Documents, or for providing a complete and operational system per the intended function. As specified above, deviations or exceptions to the Contract Documents (in addition to any conflicts, errors, or apparent omissions in the Contract Documents) shall be clearly indicated on the Contractor's shop drawing submittal. Contractor shall be responsible for any errors or omissions in the shop drawings and for the accuracy of dimensions, quantities, and the design of adequate connections and details. Contractor is also responsible for any conflicts, errors, or apparent omissions in the Contract Documents that are not brought to the Owner's attention during the shop drawing submittal process.

2. Unless specified elsewhere, Owner will return three (3) sets of shop drawing submittals to Contractor with his comments noted thereon, within thirty (30) working days following their receipt by Owner. Alternatively, Owner may elect to provide his comments to Contractor via Submittal Comment Sheet. An example Submittal Comment Sheet is attached in this Section for Contractor's reference. Contractor is expected to

thoroughly review the Owner's comments, redlines, and dimensional changes for accuracy, and advise if complying with same would prevent the Contractor from providing a complete and operational system per the intended function. It is expected that Contractor shall prepare his submittals in such a manner that he is able to obtain a complete and acceptable submittal by the second submission. Owner reserves the right to deduct monies from the amounts due to Contractor to cover the cost of the Owner's review beyond the second submission. Reimbursement to Owner shall be made by deducting such cost from the Contractor's subsequent payment requests. The reimbursements will be calculated at a flat rate of $140 per hour.

F. Corrections and Resubmittals

Contractor shall make all required corrections and shall resubmit the required number of corrected shop drawings until found in general conformance with the Contract Documents and design concept of the project. Contractor shall respond to all of the Owner's submittal review comments (even if the response is that the comment will be addressed at a later date or under a separate submittal). If Contractor fails to address all submittal review comments, Owner reserves the right to return the entire submittal without review and any delays caused thereby shall be the responsibility of the Contractor. No work which requires shop drawing submittals shall be purchased or commenced until the pertinent shop drawings have been submitted, reviewed, and approved.

1.04 Material Samples Submitted

A. General

Whenever in the Contract Documents material samples are required, Contractor shall submit to Owner not less than two (2) samples of each such item for review and approval, all at no additional cost to Owner. Upon receiving approval by Owner, one (1) set of the samples will be stamped and dated by Owner and returned to Contractor, and one (1) set of samples shall remain at the job site until completion of the work.

B. Delivery

Samples, as required herein, shall be submitted for approval at least thirty (30) days prior to ordering such material for delivery to the jobsite.

C. Identification

Contractor shall label or tag each sample, or set of samples, identifying the manufacturer's name and address, brand name, catalog number, project title, and intended use.

D. Colors, Patterns, and Textures

For items required to be of selected colors, patterns, textures, or other finish, Contractor shall submit sufficient samples to show the range of shades, values, patterns, textures, or other features corresponding to the instructions and requirements specified.

1.05 Operation and Maintenance Manuals

A. Contractor shall provide to Owner four (4) sets of detailed operation and maintenance (O&M) manuals for all mechanical and electrical equipment furnished. Each set shall consist of one (1) or more volumes, each volume shall be bound in a standard size, 3-ring, loose leaf, vinyl plastic hard cover binder suitable for bookshelf storage. Binder ring size shall not exceed 2.5". Binder(s) shall be provided with the following identification inscribed on the cover(s): "Owner's name, project name, Equipment Operation and Maintenance Manual, Volume No." Each volume shall have a table of contents which indicates all equipment in the O&M manual and tabbed divider sheets placed before each section. The O&M manuals shall include (but not be limited to) the following information:

Installation and Operation

1. Installation Instruction
2. Design Capabilities
3. Operating Parameters and Recommended Ranges
4. Specific Equipment Installed, Model No., Serial No., etc.
5. General Literature
6. Operating Instructions
7. Special Problems or Precautions and Emergency Procedures
8. Safety Provisions and Precautions

Maintenance

1. Assembly, Disassembly, and Reassembly
2. Parts List, Including Drawings (Blowup Drawings Preferred)
3. Lubrication Type and Schedule
4. Preventative Maintenance Schedule
5. Recommended Replacement Parts Inventory
6. Details of Calibration and Adjustment
7. Wiring Diagrams (as Installed)
8. Completed Maintenance Card (Copy of Form Attached)
9. Equipment Warranties
10. Name, Address, and Phone Number of Local Parts Distributor and Service Center.

B. All O&M manuals shall be submitted to Owner in final form not later than thirty (30) days before startup; all deficiencies contained therein shall be corrected by Contractor within thirty (30) days from the date of written notification by Owner; any deficiencies or changes noted during startup shall be corrected by Contractor and incorporated into the final O&M manuals.

1.06 Requests for Substitutions

A. Any reference in the Contract Documents to any item of equipment or material, by manufacturer's name, make, or other proprietary identification is intended to establish the type, function, and quality required. If the manufacturer's name is followed by the words "or equal" or "or approved equal", indicating that a substitution is permitted, such items of equipment or materials manufactured by others may be substituted provided sufficient information is submitted by the Contractor to allow the Owner to determine that such items of equipment or materials are equivalent to those named in the Contract Documents, subject to the following requirements:

1. Contractor shall demonstrate equality as to type, function, and quality of each substitute item of equipment or material. Owner shall be the sole judge as to equality; Owner's decision shall be final.

2. Contractor shall, within 30 days after Notice to Proceed or within 45 days after award of contract, make written application to Owner to furnish or use a substitute item of equipment or material.

3. Contractor shall submit a list of five (5) installations utilizing the substitute item of equipment or material, including location, contact information (name and phone numbers), and dates of initial operation. The reference provided may be used in part as a basis for establishing the ability of a manufacturer to meet the performance requirements of the specification.

4. Contractor shall submit documentation that the substitute item has been in use or operation for a minimum of five years (unless noted otherwise). Documentation shall include location and references telephone numbers that are familiar with the item.

5. Contractor shall provide Owner with all requested data in order to evaluate proposed substitution.

6. Acceptance by the Owner of a substitute item shall not relieve Contractor of the responsibility for full compliance with the Contract Documents and for adequacy of the substitute item. Contractor shall be responsible for any changes and costs which may be required for substitutions.

7. Owner shall be allowed a reasonable time in which to evaluate each proposed substitute. Owner will record the period of time required to evaluate substitutions; Contractor shall reimburse Owner for charges whether or not the proposed substitute is accepted. Reimbursement to Owner shall be made by deducting such cost from the Contractor's subsequent payment requests. The reimbursements will be calculated at a flat rate of $140 per hour.

1.07 Record Drawing Submittal

A. Contractor shall keep and maintain at the jobsite one (1) set of record drawings. Contractor shall mark on drawings all changes in project conditions, locations, configurations, and any deviations which may vary from the details represented on the original Contract Drawings, including, but not limited to, buried or concealed construction and utility features which are revealed during the course of construction. Contractor shall record the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings.

Said record drawings shall be supplemented by detailed sketches as necessary to indicate the work actually constructed. These master record drawings of Contractor's representation of as-built conditions, including all revisions made necessary by addenda, change orders, and the like, shall be maintained up-to-date during the progress of the work. Record drawings shall be accessible to Owner at all times during the construction period and shall be delivered to Owner upon completion of the work.

B. Payments pursuant to partial payment will not be made if the record drawings are not kept current, and if the record drawings, showing all variations between the work as actually constructed and as originally shown on the Contract Drawings or other Contract Documents, have not been inspected by Owner.

C. Final payment will not be acted upon until Contractor has prepared and delivered complete, current record drawings to Owner. Said record drawings which must reflect all completed work, may be in the form of a set of prints with carefully plotted information overlaid in colored pencil.

1.08 Contractor's Requests for Information (RFIs)

Contractor may submit a Request for Information when it is necessary to obtain information or clarification regarding: requirements of Contract Documents, interpretation of Contract Documents, or apparent errors or omissions in Contract Documents. An RFI may also be submitted to state the Contractor's concern related to the omission or misapplication of a product, or to call to Owner's attention a superior product based on the Contractor's expertise. Contractor is expected to use the RFI form

attached to this Specification. Contractor is not responsible for the Owner's costs associated with evaluating and responding to an RFI; however, Owner will not review Contractor's RFIs that are in fact Requests for Changes (RFCs), as determined by Owner. In such cases, Contractor will be required to resubmit on the appropriate RFC form. See Part 1.09 herein. Contractor shall allow Owner up to thirty (30) working days to respond to Contractor's RFIs. As such, Contractor is expected to thoroughly review all applicable portions of the Contract Documents for which the work is contemplated well in advance of Contractor commencing the actual work. This will allow Contractor sufficient time to prepare the necessary RFIs and will allow Owner sufficient time to evaluate and prepare responses to same.

Within one week of receiving an RFI response from Owner, Contractor is required to notify Owner (in writing) if there are any cost or schedule impacts associated with Owner's response. Said notification shall be submitted as a Request for Change Order. All Requests for Change Order shall be submitted with proper justification and supporting documents, as determined by Owner. If no such advisement is made by Contractor, it will be understood that Contractor understands and accepts Owner's response, and that there are no cost or schedule impacts to the Contractor associated with same (even if the RFI response constitutes a change to the Contractor's scope of work).

1.09 Contractor's Requests for Change (RFCs)

Contractor may submit a Request for Change when Contractor proposes a change in the Contract requirements. All change requests shall be submitted on the RFC form attached to this Specification. As shown therein, Contractor is required to fully describe the benefit(s) to the Owner, benefit(s) to the Contractor, the cost and/or schedule impact(s) associated with the requested change, along with whether or not Contractor proposes or requires a Contract Change Order for implementing the change. Except for as described in Part 1.08 herein, any Contractor RFC that is submitted on the RFI form will be returned without review.

As noted on the RFC form, it is understood that certain RFCs can be responded to promptly, with minimal expenditures required by Owner. It is also understood that other RFCs require significant expenditures by Owner in order to properly evaluate and respond to Contractor's RFC. For those RFCs that fall in the latter category, Owner will provide an estimate (time and money) to Contractor as an initial response to RFC. Contractor may then elect to have Owner proceed with evaluating Contractor's RFC (with estimated value deducted from Contractor's Contract with Owner), or elect to withdraw Contractor's RFC.

1.10 Submission in Electronic Media Format

In addition to providing paper (i.e. hard) copies, all documents (CPMs, Progress Schedule, RFIs, RFCs, Submittals, Operations and Maintenance Manuals, Change Order Requests, etc.) shall be submitted electronically.

A. General

Provide all information in searchable portable document file (PDF) format; PC compatible using Windows operating system as utilized by the Owner. All information provided shall be consolidated to one PDF in the latest version of Adobe Acrobat, with a Table of Contents and bookmarks for each major section (for each submittal). When required below (or if required otherwise by Owner), documents shall also be provided electronically in Word format. If document exceeds the size in which Owner can receive by email (generally larger than 5 MB to 10 MB), the document shall be uploaded to the Owner's FTP site (if available), or saved onto a CD and transmitted to Owner.

B. Contractors using other software shall be required to provide to the Engineer conclusive evidence of 100 percent data transfer capability.

C. Shop Drawing Submittals

In addition to submitting eight (8) hard copies of all shop drawing submittals (see Part 1.03 herein), Contractor shall submit shop drawing submittals electronically in PDF format (searchable from bookmarks). This applies to all text documents, manufacturer's literature, diagrams, and all graphic submittals. Provide one (1) PDF file using the latest version of Adobe Acrobat.

D. O&M Manuals

In addition to submitting six (6) hard copy sets of all O&M manuals (see Part 1.05 herein), Contractor shall submit six (6) copies of a single DVD containing the entire O&M manual in PDF format (searchable from Table of Contents and bookmarks).

E. RFIs, RFCs, Correspondence, and Change Order Requests

Provide electronic submission in Word and PDF format, plus one (1) hard copy. If required by Owner, provide one (1) CD (copy) containing the entire document with attachments.

SAMPLE
BEAUMONT-CHERRY VALLEY WATER DISRICT
SHOP DRAWINGS/SUBMITTAL REVIEW COMMENT SHEET

Job No.: Date:

Project:

Owner:

Contractor:

Submittal No.: 15

Description: Vertical Turbine Pumping Units

COMMENTS:

Contractor shall **revise and resubmit** complete submittal addressing the following comments:

1. Vertical Turbine Pumping Units

   A. Per Parts 1.02.B.4 and 1.02.C.4 of Specification Section 11310, each fabricated steel discharge head shall be provided with an AWWA C207 Class E flanged base in lieu of proposed bottom plate.

   B. Although a +5% to +8% increase in total dynamic head is allowed by the Hydraulic Institute, the total dynamic head for each proposed pumping unit at the design flow rate shall be as specified in Parts 1.02.B.1 and 1.02.C.1 of Specification Section 11310. If said design condition causes the proposed motor to be overloaded (at 1.0 service factor) at any point on the pump performance curve, the pumping unit impellers shall be trimmed accordingly to reduce the motor load to non-overloading conditions (at 1.0 service factor).

   C. Although the pump cans will be provided by others, per Part 1.05 of Specification Section 11310 (Schedule A), the manufacturer shall verify the applicability of pumping equipment with respect to NSPHa, suction piping, pump can and discharge geometry to ensure prevention of cavitation, vibration, surging, overheating, corrosion, and vortexing. Refer to the Construction Drawings and piping/pump can fabrication drawings for suction and discharge piping and pump can information.

   D. Per Part 2.02.B of Specification Section 11310, pumping unit impellers shall be hydraulically balanced in addition to dynamically balanced.

   E. Per Part 3.02 of Specification Section 11310, the Contractor shall be responsible for installation. However, per Part 3.04 of Specification Section 11310, Contractor shall submit a letter to the Owner confirming that all pumping equipment was

inspected, operation checked, and installation approved in writing by the pumping equipment supplier prior to operation of the equipment.

F. Per Part 3.03 of Specification Section 11310, the pump manufacturer's representative shall supervise the field acceptance testing and shall certify in writing that the equipment and controls have been properly installed, aligned, lubricated, adjusted, and readied for operation.

G. Per Part 3.03.A of Specification Section 11310, vibration of complete pumping unit as tested in the field shall not exceed 0.0025" peak to peak amplitude when operating. If said maximum vibration amplitude is exceeded, the pumping units shall receive a final field trim balance.

H. Pump performance curves were not submitted for proposed pumping units as required per Parts 1.03 and 1.04 of Specification Section 11310. Submitted curves are not legible. Submit pump performance curves full size on 8-1/2" (ordinate) x 11" (abscissa) paper for proposed pumping units including the following:

1) Shutoff head, head versus capacity, pump bowl efficiency versus capacity, and brake horsepower versus capacity, all for full operating range specified.

2) Certified values on each curve at all specified design points demonstrating compliance with the pumping unit requirements as outlined in Parts 1.02.B.1 and 1.02.C.1 of Specification Section 11310.

3) Arrows pointing to the limits of recommended stable operation between which pumps are to be operated to prevent surging, cavitation, and vibrations. Limits of operation shall be included on each speed curve provided for the FE/BWS pump.

I. Submitted pump manufacturer's brochure is for M Series Vertical Turbine Pumps. Submitted bill of materials, pump data sheets, pump dimensional sheets, and Operation and Maintenance manual indicate the proposed pumps are Model VIC. Submit data confirming that proposed pumps are either M Series or Model VIC. Submit manufacturer's brochure corresponding to the proposed pumps.

J. Per Parts 1.02.B and 1.02.C of Specification Section 11310, pumping units shall operate with suction can pressure ranging from 0 to 5 psi. Submitted hydraulic analyses indicate the pump is suitable for operating with suction can pressure of 0 psi. Submit data indicating that pumping units are suitable for operation within the specified suction can pressure range.

K. The FE/BWS pump discharge head shall be provided with a 36" Class E flanged base (46" O.D.) to match the approved pump can fabrication drawings in lieu of proposed 48.75" O.D. bottom plate.

L. Per Part 1.02.C.4 of Specification Section 11310, the discharge head for the RCW unit shall be provided with the dimensions shown on the Construction Drawings. The dimension shown on the Construction Drawings from the bottom of the discharge head base flange to the centerline of the discharge is 26-1/12". Submitted dimensional drawing for the RCW pump discharge head indicates this dimension will be 27". Revise drawings to include the required 26-1/2" dimension.

M. Per Part 2.02.A of Specification Section 11310, the pump bowls shall be lined with vitreous porcelain enamel in lieu of submitted epoxy. Per submitted manufacturer's vertical turbine pump brochure, glass-lined cast iron bowls is a standard design feature. Submit manufacturer's product data sheets on glass lining in lieu of epoxy coating.

N. Per Part 2.02.A of Specification Section 11310, the pump bowls shall be of Class 30 (or better) cast iron and have minimum tensile strengths of 30,000 psi. Submit data verifying same.

O. Per Part 2.02.B of Specification Section 11310, the pump impellers shall be of the enclosed type. Submit data verifying that proposed impellers are of the enclosed type.

P. Per Part 2.02.H of Specification Section 11310, the strainer shall be provided with cross vanes for vortex suppression. Submit manufacturer's product data sheets for proposed strainer verifying same.

Q. Per Parts 1.02.B.8 and 1.02.C.8, basket strainer shall be attached to pump with stainless steel fasteners. Submit data indicating same.

R. Per Parts 1.02.B.6, 1.02.C.6, and 2.02.J of Specification Section 11310, the top shaft shall be two-piece with a coupling accessible within the pump discharge head. Said coupling shall be flanged. Submit manufacturer's data sheets for required coupling.

S. Nameplate data was not provided with submittal. Submit proposed nameplate for pumping units per Part 2.04 of Specification Section 11310.

T. Manufacturer's proposal to provide John Crane Type 1 mechanical seal in lieu of specified John Crane Type 21 mechanical seal is acceptable. However, resubmit manufacturer's product data sheets for proposed mechanical seal clearly delineating the proposed materials of construction. Provide drawing detail of mechanical seal as installed in discharge head, including all necessary piping and drain line to pump can.

U. Proposed Tnemec N140 epoxy coating is accepted for coating the pump head and column.

2. Vertical Hollow Shaft Electric Motors

A. Although proposed motors will be balanced to limit the vibration to 0.08 inches per second, the total vibration for the assembled pumping unit as tested in the field shall not exceed 0.0025" peak to peak amplitude when operating.

B. Per Part 2.06.N of Specification Section 11310, the lubrication system shall have sufficient oil storage and cooling capacity to limit the oil bath temperature rise to 45° C above 40° C ambient temperature. Proposed exception states that Emerson's standard oil bath temperature rise will be provided. Submit data for Emerson's standard oil bath temperature rise design.

C. Manufacturer's statement that motors will be provided with "Emerson standard oversized main conduit box" is unacceptable. Per Part 2.06.R of Specification Section 11310, motors shall be equipped with extra-large heavy duty split type conduit boxes. Manufacturer's catalog information indicates that conduit boxes one size larger than standard are available for vertical hollow shaft motors. Submit manufacturer's product data sheets indicating proposed motors will be provided with required conduit boxes.

D. Proposed 7.5 hp TEFC motor shall be provided with drain and breather elements (brass construction). Submit written confirmation of same.

E. The requirements set forth in Specification Section 16150 do not apply to the proposed vertical hollow shaft motors; therefore, the submitted exceptions to same are not necessary.

F. Submitted data sheets for the FE/BWS pumping unit motor include an 1,800 rpm motor. Per submitted pumping unit data and Part 1.02.B.1 of Specification Section 11310, a 1,200 rpm motor is required for said pumping unit. Submit manufacturer's product data sheets for required motor.

G. Submitted data sheets for the proposed motors include an ambient temperature rating of 40° C (104° F). Per Item 10 of the Supplemental Special Requirements, all equipment shall be designed for maximum ambient temperature of 120° F. Submit revised motor data sheets demonstrating that motors will be provided with required temperature rating suitable for continuous operation at 120° F ambient temperature.

H. Per Part 2.06.L of Specification Section 11310, motors shall be equipped with angular contact ball thrust bearings. Submit data verifying required bearings will be provided. Submit motor thrust capacity for one year L-10 minimum life.

I. Per Part 2.06.O of Specification Section 11310, motor thermal protection shall be set to open control circuit at 135° C. Submit data verifying same. Contractor shall coordinate installation of motor thermal control modules (Siemens Thermasentry) to be provided by the motor manufacturer with the MCC manufacturer for mounting in the respective bucket.

J. Not all nameplate data required per Part 2.06.T of Specification Section 11310 is included in submitted motor nameplate data. Resubmittal shall include all the requirements as set forth in the Specification for each proposed pumping unit, including connection nameplate data per Part 2.06.T.2 and bearing nameplate data per Part 2.06.T.3 of Specification Section 11310.

K. Proposed motors for the RCW pumping units are not required to be inverter duty.

L. Submit replacement parts list for proposed FE/BWS pump motor, similar to submitted replacement parts list for proposed RCW motor.

M. Submitted manufacturer's motor brochure is for Weather Protected Type 1 vertical motors. The proposed motor for the RCW pumping unit is Totally Enclosed Fan Cooled (TEFC). Submit manufacturer's product brochures for TEFC motors.

FOR ADDITIONAL COMMENTS, SEE THE FOLLOWING SHEETS AND/OR DRAWINGS:

N/A

☐ ACCEPTED	☐ REJECTED
☒ REVISE AND RESUBMIT	☐ FURNISH AS CORRECTED
☐ SUBMIT SPECIFIED ITEMS	☐ _____

Corrections or comments noted on shop drawings do not relieve contractor of responsibility to comply with Contract Documents. Shop drawing review is hereby performed only to verify general compliance with the Contract Documents and general conformance with the design concept.

Date: _____ By: _____

BEAUMONT-CHERRY VALLEY WATER DISRICT
EQUIPMENT MAINTENANCE DATA SHEET

PREVENTIVE MAINTENANCE PROGRAM	**EQUIPMENT RECORD NUMBER**		
EQUIPMENT DESCRIPTION	**ELECTRICAL OR MECHANICAL DATA**		
Name:	Nameplate Horsepower:		
Serial No.:	Model:		
Vendor:	Catalog Number (polyphase motors):		
Vendor Address:	Type:		
	Manufacturer:		
Vendor Rep:	Voltage:	Measured Current:	Nameplate Current:
Phone:	Phase:	Overload Relay Setting:	rpm:

MAINTENANCE AND LUBRICATION WORK TO BE DONE	Frequency *

SPARE PARTS LIST		**FUSES/LAMPS/SEALS**		
Quantity	Part & Part Number	Qty	Size	Type & Ordering Description

WARRANTY AND OPERATING REQUIREMENTS AND REFERENCE

*D - Daily; W - Weekly; B - Biweekly; M - Monthly; Q - Quarterly; S - Semiannually; A - Annually

SAMPLE
BEAUMONT-CHERRY VALLEY WATER DISRICT
EQUIPMENT MAINTENANCE DATA SHEET

PREVENTATIVE MAINTENANCE PROGRAM	**EQUIPMENT RECORD NUMBER**		
EQUIPMENT DESCRIPTION	**ELECTRICAL OR MECHANICAL DATA**		
Name: Influent Pump No. 1 Tag No.: P01-1	Nameplate Horsepower: 15 HP		
Serial No.: 123456ABC	Model: 140T Frame Serial No. 987654ZY Class F Insulation w/ Space Heater		
Vendor: ABC Pump Co.	Catalog Number (polyphase motors): M36999b		
Vendor Address: 1234 Richter Avenue Irvine, CA 92604	Type: Vertical Turbine Pump, Model VTR14 with 3 stages, impeller 147, and 12 1/2" trim.		
	Manufacturer: DEF Motors, Inc.		
Vendor Rep: XYZ Equipment, Inc.	Voltage: 460	Measured Current: 18 amps	Nameplate Current: 20 amps
Phone: 949-752-0505	Phase: 3	Overload Relay Setting: 25 amps	rpm: 1,800

MAINTENANCE AND LUBRICATION WORK TO BE DONE	Frequency *
1. Operate valves and check such things as a) bearing temperature, b) changes in running sound, c) suction and discharge gage readings, d) pump discharge rate, and e) general condition of the drive equipment.	D
2. Check packing.	D
3. Check pumping unit for any dust, dirt or debris.	W
4. Lubricate bearing frame and motor bearings (consult manufacturer's instructions for type of grease or oil).	Q
5. Disassemble and change or repair the following: a) impeller, b) shafts, c) shaft sleeve, d) rotary seals, and e) sleeve bearings.	A

SPARE PARTS LIST		**FUSES/LAMPS/SEALS**		
Quantity	Part & Part Number	Qty	Size	Type & Ordering Description

WARRANTY AND OPERATING REQUIREMENTS AND REFERENCE

For manufacturer's instructions regarding installation, operation, maintenance and troubleshooting of this equipment, see Volume ____, Section ____.

*D - Daily; W - Weekly; B - Biweekly; M - Monthly; Q - Quarterly; S - Semiannually; A - Annually

SAMPLE
BEAUMONT-CHERRY VALLEY WATER DISRICT
CONTRACTOR'S REQUEST FOR INFORMATION (RFI) #_____

To (Engineer):	
From (Contractor):	
Subject:	
Reference: Construction Drawing:	Specification (Section and Page):
REQUEST	
Information is requested as follows:	
Information Requested By (Name):	**Date**:
Response Requested By (Date):	
Received by Owner's Representative (Date):	
RESPONSE	
Response to Information Request:	
Response By (Name):	**Date**:

Final Distribution:

SAMPLE
CONTRACTOR'S REQUEST FOR CHANGE (RFC) #_____

To (Engineer):	
From (Contractor):	
Subject:	
Reference: Construction Drawing:	Specification (Section and Page):
REQUEST	
The following change is requested:	
Change Requested By (Name):	**Date**:
Response Requested By (Date):	
Received by Owner's Representative (Date):	
Benefit to Owner:	
Benefit to Contractor:	
Cost and/or Schedule Impact:	
Change Order Required or Proposed? ____ YES ____ NO	
RESPONSE	

Response to Change Request: (1)	
RESPONSE (Continued)	
Response By (Name):	**Date**:

(1) It is understood that certain RFCs can be responded to promptly, with minimal expenditures required by Owner. It is also understood that other RFCs require significant expenditures by Owner in order to properly evaluate and respond to Contractor's RFC. For those RFCs that fall in the latter category, Owner will provide an estimate (time and money) to Contractor as an initial response to RFC. Contractor may then elect to have Owner proceed with evaluating Contractor's RFC (with estimated value deducted from Contractor's Contract with Owner), or elect to withdraw Contractor's RFC.

Final Distribution:

SECTION 02300
EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section includes specifications for earthwork including excavation, trench excavation for underground utilities, ballast and subballast removal, placement of backfill, and construction of embankments. Section also includes requirements for placement of detectable tape for underground utilities.

1.02 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM International):

1. C131 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
2. C136 Sieve Analysis of Fine and Coarse Aggregates
3. D422 Particle-Size Analysis of Soils
4. D1556 Density and Unit Weight of Soil in Place by the Sand-Cone Method
5. D1557 Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./cu. ft.)
6. D2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)
7. D2922 Test Method for Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)
8. D3017 Test for Moisture Content of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)
9. D3740 Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction

B. State of California, Department of Transportation, Standard Specifications (Caltrans):

1. Section 19 Earthwork

1.03 DEFINITIONS

A. Existing Ballast: Granular material in areas of existing tracks, between top of tie and existing subgrade. The depth of existing ballast varies.

B. Degree of Compaction: A percentage of the maximum density obtained by the test procedure presented in ASTM D1557, Method C.

C. Satisfactory Materials: Any material classified by ASTM D2487 as GW, GP, SW, SP, SC, GM, GC, and SM.

D. Unsatisfactory Materials: Materials that do not comply with the requirements for satisfactory materials. Unsatisfactory materials include those materials containing roots and other organic matter, trash, debris, stones larger than 3 inches, and materials classified in ASTM D2487 as PR, OH, OL, CH, MH, and ML. Unsatisfactory material also includes refuse and other material.

1.04 SUBMITTALS

A. Submit the following pothole shop drawings if specifically required in the Special Conditions. Submit shop drawings of potholed pipes, sewers, utilities and other facilities a minimum of two (2) weeks before beginning shoring excavation or underground construction. Show survey information at each location, and accurately establish the size, location, elevation, and alignment of the facility as well as the existing grade elevations in the vicinity of the potholes. Include the bearing of the facility alignment, coordinates at the centerline of the facility for pipelines, and the coordinates of the corners of boxes, manholes, and other similar types of facilities. Label pertinent information relating to the bent, column, footing, track alignment, and other proposed improvements including new or relocated underground facilities (waterline, sewer, storm drain, combined system duct bank, and underdrain). Include footing dimensions, bent skew, stationing, column offsets, and footing elevations. Proceed with no trenching, excavation, or shoring work until the Engineer has accepted potholing shop drawings. Shop drawings shall be prepared at 1:20 or 1:60 scale, sufficient to show the following information:

1. Topography
2. The entire bent and footings
3. Columns adjacent to the potholes
4. The track alignment
5. Other proposed improvements in the vicinity that might be affected by the location of the existing pipe, sewer, utility or other facility

1.05 DELIVERABLES

A. Submit copies of test reports for material properties and compaction as required in this Section.

1.06 QUALITY ASSURANCE

A. Inspection and Testing Agency retained for inspection and testing specified in this Section shall meet the requirements of ASTM D3740.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Imported Backfill shall consist of well-graded sand, gravel, crushed gravel, crushed stone composed of hard, tough and durable particles, and shall contain not more than 10 percent by weight of material passing a No. 200 mesh sieve and no less than

95 percent by weight passing the 3/4-inch sieve. The maximum allowable aggregate size shall be 1 inch. Gradation shall be determined in accordance with ASTM C136 or D422, as applicable.

B. The following materials shall be as specified in the respective Sections of the Caltrans Standard Specifications, except as otherwise indicated:

1. Structure Backfill: Section 19-3.06, Structure Backfill

2. Pervious Backfill: Section 19-3.065, Pervious Backfill Material

3. Slurry Cement Backfill: Section 19-3.062, Slurry Cement Backfill

C. Soil Stabilization Geotextile: Tensar Bi-Axial Geogrid reinforcement or Engineer approved equal.

D. Bedding Material for Culverts, Pipes, and Utilities: Sand conforming to Caltrans Standard Specifications, Section 19-3.025B, Sand Bedding.

E. Underground Warning or Detectable Tracer Tape: Terra Tape Reinforced Sentry-Line as manufactured by Reef Industries, or Engineer approved equal. Extra stretch is acceptable if Reinforced type is not available for the color. Uniform color code (per APWA) as follows:

Identification	Type	Color
Gas Line	12" wide Reinforced	Yellow
Water Line	6" wide Reinforced	Blue
Electrical Line	12" wide Reinforced	Red
Sewer, Drain, Irrigation Line	6" wide Reinforced	Green
Fiber Optics, Signal, Communications Line	12" wide Reinforced	Orange

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Existing Underground Lines and Services: Remove or abandon in place unclaimed, abandoned utilities as indicated on the Contract Drawings.

B. Utilization of Excavated Materials: Use material removed from excavations for backfill, embankment, subgrade, and similar purposes, unless the material is unsatisfactory. Refer to Article entitled "Excess Material" herein for disposal of excess materials.

C. Use existing salvaged ballast for backfill, bedding, embankment, or fill as designated by the Engineer.

D. Erosion Protection: Refer to Section 01560, Temporary Controls, for storm water pollution prevention, dust control, and related requirements. Protect exposed graded areas from wind and water erosion until stabilization is achieved.

E. Perform dewatering as necessary. Refer to Section 02210, Dewatering.

F. Use Soil Stabilization Geotextile for soil stabilization where indicated in the Contract Drawings.

3.02 EXCAVATION

A. Excavate material encountered within the limits of the work, to the lines, grades, and elevations as indicated on the Contract Drawings and as specified herein.

1. In areas where track is to be constructed in the location of an existing track, excavate to the subgrade indicated on the Contract Drawings or bottom of existing ties, whichever is lower.

B. General construction excavation shall not exceed 1 vertical to 1 horizontal slope. If this cannot be accomplished, provide temporary shoring, sheeting and bracing as necessary to retain excavations, maintain banks securely, withstand water pressure, and prevent cave-ins in accordance with Section 02200, Support of Excavation.

C. Perform excavation and placement of fill in a manner and sequence that will provide proper drainage at all times.

D. Surfaces shall be level, or sloped if required, clean, and clear of loose soil. Maintain in good condition until overlying materials are placed.

E. Perform measures to correct over-excavation due to error or careless excavation procedures.

F. Perform structure excavation in accordance with Caltrans Standard Specifications, Section 19-3, Structure Excavation and Backfill.

G. Maintenance of Excavation: When backfill is placed, remove sheeting and bracing in stages so that the walls are supported by the shoring or by newly placed backfill.

3.03 BACKFILL (GENERAL)

A. Place backfill in layers not to exceed 8 inches of loose material, and compact each layer to at least 95 percent laboratory maximum density, in such a manner as to prevent wedging action or eccentric loading.

B. Backfill excavations when installations have been completed, inspected, and approved. Ensure that the following conditions are satisfied prior to proceeding with backfill operations:

1. Concrete has attained sufficient strength to withstand pressure of earth and compacting operation.

2. Excavations are free of forms, debris, and other foreign materials.

C. Place structure, pervious, and slurry cement backfill as specified in the following respective Sections of the Caltrans Standard Specifications, except as otherwise indicated:

1. Structure Backfill: Section 19-3.06, Structure Backfill

2. Pervious Backfill: Section 19-3.065, Pervious Backfill Material

3. Slurry Cement Backfill: Section 19-3.062, Slurry Cement Backfill

3.04 BACKFILL, BEDDING AND FILL FOR CULVERTS, PIPES, AND UTILITIES

A. Bottom of Trench Compaction. Bottoms of excavations shall be firm, undisturbed earth or cut subgrade, clean and free from loose materials, debris, and foreign matter. When bottoms of excavations or trenches are a soft or unstable materials, make bed firm and solid by removing said unstable materials to a sufficient depth and replace same with sand or pea gravel, and compact to a minimum of 90 percent relative compaction. If during construction, soft soils are encountered at depths that make removal impractical, notify the Engineer.

1. Refer to Section 02650, Precast Concrete Culverts, for specific requirements for precast culvert trenches. Refer to Section 15550, Storm Water Lift Stations, for specific requirements for precast vault manhole for pump station.

B. Bedding and Backfill Around Pipes:

1. Before the initial layer of bedding is placed, tamp the bottom surface of the trench or compact bottom surface by plate or other means to provide a base for the bedding.

2. Before the pipe or conduit is laid, place and compact bedding material in conformance to the provisions in Caltrans Standard Specifications, Section 19-3.025, Culvert Beddings. Do not use jetting.

C. Unless specified elsewhere, backfilling for underground utilities shall comply with the following:

1. Replace any unsuitable material with approved backfill material and compact as specified herein. Approved backfill material shall include:

a. Native excavated material approved to the Engineer

b. Salvaged track ballast approved by the Engineer

c. Imported Backfill (if native material or reclaimed track ballast is not available)

2. Place and compact initial lifts in six (6) inch layers maximum uncompacted thickness until 12 inches over pipe. Subsequent lifts may be up to 12 inches in depth prior to compaction. Bring up uniformly on both sides of pipe.

3. Compact foundations for underground utilities and associated structures to not less than 95 percent of the maximum density as determined by ASTM D1557.

4. Place tracer tape (detection tape) one foot above new and recently exposed buried utilities including conduits, fiber optics, communication and signal cables, gas lines, petroleum lines, water lines, and electrical lines. Lay tape flat with three foot of overlap at the end of rolls. If tracer tape depth will exceed tape manufacturer's recommendation, obtain additional instructions from the Engineer before proceeding.

D. Place and compact structure backfill at culverts as specified in this Section under Backfill (General) and as follows:

1. When the level of fill reaches the top of the structure, spread and hand compact two lifts over the structure without traversing the structure with heavy equipment. Begin no compaction with heavy equipment until a minimum of two lifts have been placed, hand compacted, and tested.

2. Back and compact backfill to the same elevation on both sides of the culvert before proceeding to the next layer.

3. When the height of cover indicated on the approved shop drawings or Contract Drawings, as applicable, is 12 inches or less, backfill structure with slurry cement backfill to the top of the structure.

4. In regard to precast concrete culverts, operate equipment over the culvert in accordance with the culvert manufacturer's recommendation.

E. Keep construction equipment away from edges of excavation a distance equal to the depth of the excavation.

F. Do not place stones larger than 3 inches in backfill around pipes.

G. Refer to compaction and field quality control requirements specified herein for additional requirements.

3.05 EMBANKMENTS

A. Clear and grub ground surface on which embankment fill is to be placed of live, dead, or decayed vegetation including trees; rubbish; debris; and other unsatisfactory material in accordance with Section 02110, Site Clearing.

B. Scarify prepared ground surface and moisten or aerate as required just prior to placement of embankment materials to ensure bond between embankment material and the prepared ground surface.

C. Construct earth embankments from satisfactory materials free of organic or frozen material. Use no rocks greater than 3 inches. Place material in successive horizontal lifts of loose material not more than 12 inches in depth. Prior to placement of each layer, moisten or aerate soil surface as necessary and scarified or otherwise broken up in such a manner that the fill will bond with the surface on which it is placed. Uniformly spread layer. After spreading each layer, plow, disk, or otherwise break up layer; moistened or aerated as necessary; thoroughly mix; and compact to at least 90 percent laboratory maximum density, if more than two (2) feet below subgrade elevation, and 95 percent if within two (2) feet of subgrade elevation.

3.06 GRADING

A. Grading shall conform to the Contract Drawings and the tolerances specified herein. Transport satisfactory excavated materials to and place in fill or embankment within the limits of grading work. Excavate unsatisfactory materials encountered within the limits of the work and replace with satisfactory materials. Remove unsatisfactory materials and dispose of as specified in the Article entitled "Excess Materials" herein.

B. Finish the surface of excavations, embankments, and subgrade to a smooth and compact surface in accordance with the lines, grades, and cross sections or

elevations shown on the Contract Drawings. Finish grade to within 1/2 inch of the grades and elevations indicated. Finish ditches in a manner that will result in effective drainage.

C. Preparation of Subgrade: Shape subgrade to line, grade, and cross section, and compacted as specified. Shaping subgrade shall include plowing, disking, scarifying existing track subgrade and moistening or aerating required to obtain specified compaction. Remove soft or otherwise unsatisfactory material and replace with satisfactory excavated material or other approved material as directed. Bring low areas resulting from removal of unsatisfactory material up to required grade with satisfactory materials, shape entire subgrade to line, grade, and cross section, and compact as specified. After rolling, the surface of the subgrade shall not show deviation greater than 1/2 inch when tested with a 10-foot straightedge applied both parallel and at right angles to the centerline of the area.

D. Protection and Maintenance of Subgrade:

1. Maintain ditches and drains along subgrade at all times as required to effectively drain the subgrade. Do not disturb finished subgrade by traffic or other operations. Protect and maintain subgrade in a satisfactory condition until ballast, subballast, base, or pavement is placed. Do not store or stockpile materials on the finished subgrade.

2. Obtain Engineer's inspection and approval of subgrade prior to laying base, subballast, ballast, or pavement. Place no base, subballast, ballast, surfacing, or pavement on a muddy, spongy, or frozen subgrade.

3.07 COMPACTION

A. Do not compact fill or backfill until it has attained the required moisture content. Add an accurately determined and carefully measured amount of water to the materials or surfaces which are too dry. Dry material containing an excess of moisture by manipulation, aeration, drainage, or other means before being compacted. Refer to Field Quality Control field moisture and related testing.

B. When subgrade has been prepared and has reached required grade, proof-roll surfaces to determine if soft spots exist in the material using a 50-ton pneumatic-tired roller or similar approved equipment. If wet or spongy areas are revealed, notify the Engineer so that corrective measures may be determined. Remove soft spots and refill until they meet the required compaction. Proof-roll areas which support the track structure, paving, utility structures, buildings, or other structures in the presence of the Engineer and obtain the Engineer's approval before further earthwork operations are performed.

C. In addition to proof-rolling, perform field density tests as specified under Field Quality Control herein.

D. Use power-operated or power-driven hand operated equipment wherever possible to compact to requirements specified herein. Do not operate mobile equipment closer to foundation than a horizontal distance equal to the height of backfill above bottom of wall. Accomplish compaction using sheep foot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibrator compactors, or other approved equipment well suited to the type of material being compacted.

E. If the degree of compaction is unsatisfactory, make necessary adjustments until specifications are met. Remove material placed over layers not satisfactorily compacted and re-compact unsatisfactory areas.

F. Unless otherwise noted, relative compaction of fill materials composing each layer of fill shall not be less than 95 percent as determined by ASTM D1556.

G. These compaction requirements do not apply to material placed in stockpiles or waste areas.

3.08 EXCESS MATERIAL

A. Dispose of material authorized to be wasted outside the work site in accordance with GP7.16, Disposal of Material Outside the Work Site, or at waste areas designated on the Contract Drawings, if applicable. Do not dispose of any excavated material in such a manner as to obstruct the flow of any stream, impact wetlands, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

B. The following requirements apply to waste sites designated in the Contract Documents for the Contractor's use:

1. The limits of the storage location will be designated by the Engineer. Keep stockpiles clear of tracks and other facilities, and preventing erosion. Create stockpiles in a manner that does not disturb or damage other work.

2. Construct discrete stockpiles that measure no more than 1000 cubic yards and in a shape that is easily measured by the Engineer or surveyor.

3. Avoid mixing of dissimilar materials. Construct each stockpile of similar material, such as non-impacted overburden soil, obviously compacted soil, or debris. Segregate dissimilar debris materials to facilitate salvage or recycling.

4. Move soil impacted by contaminants around the work site only with the approval of the Engineer.

5. Protect stockpiled soil in accordance with Section 01560, Temporary Controls. Cover stockpiles with plastic sheeting secured against removal by wind or rain. On a daily basis, inspect plastic sheeting covering stockpiles and make necessary repairs.

6. Inform the Engineer each day of the number and locations of stockpiles created that day.

7. When the Engineer has completed sampling from a stockpile, the Engineer will place an identification sign in the stockpile. From that date forward, add no soil to nor remove soil from the stockpile without the approval of the Engineer.

3.09 FIELD QUALITY CONTROL

A. Testing shall be performed by an approved Inspection and Testing Agency retained by the Contractor.

B. Unless otherwise indicated, perform field in-place density testing in accordance with ASTM D1556. Perform field density tests in accordance with ASTM D1556 (Sand-Cone Method). Periodically verify density tests by the nuclear probe method in accordance with ASTM D2922 with density tests from the Sand-Cone method. Minimum number of field density tests shall be as follows:

1. One field density test shall be taken for every 300 linear feet of track for each lift of soil placed and at each grade crossing.

2. One field density test shall be performed for each 1,000 square feet of embankment for each layer of compacted fill.

C. Determine the relative compaction of fill materials composing each layer of fill in accordance with ASTM D1556. Perform testing at same frequency as specified for field in-place density testing.

D. Maximum Dry Density and Optimum Moisture Content: The maximum dry density and optimum moisture content of non-granular soils (greater than 12 percent by weight passing through a No. 200 sieve) shall be determined by one of the methods described in ASTM D1557.

E. Moisture Control: Perform field moisture tests in accordance with ASTM D3017 (Nuclear Probe Method). At the time of compacting, backfill material and the surface on which it is to be placed shall be within plus or minus two (2) percent optimum moisture content and meet specified compaction requirements.

END OF SECTION

SECTION 02444

CHAIN LINK FENCING AND GATES

PART 1 -- GENERAL

1.01 DESCRIPTION

Requirements specified in Conditions of the Contract and Division 1 form a part of this Section. The Work of this Section includes all labor, machinery, construction equipment and materials to install new chain link fencing as shown on the Drawings, and to remove and re-install existing fencing and gates as shown on the Drawings. Gates shall be provided as shown. The fence shall be of height shown on the Drawings and Option selected, and shall include bottom tension wire, top rail, and an option to install three (3) strands of barbed wire running along the top of the fence attached to extension arms. Portions of existing fence and associated fence poles removed or altered in performance of Work of this Contract shall be replaced.

A. The Contractor shall provide chain link fencing and gates and appurtenant Work, complete and operable, in accordance with the Contract Documents.

B. **Single Manufacturer**: Chain link fencing, gates, accessories, fittings, and fastenings shall be products of a single manufacturer.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARD STANDARDS

All work and materials shall conform to the applicable or referenced portions of the Standard Specifications for Public Works Construction of the Joint Cooperative Committee of the APWA-AGC, latest edition, (SSPWC) including latest supplements. In case of conflict between any requirements set forth in these Specifications and any provisions of said Standard Specifications, the requirements set forth herein shall control.

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

B. Commercial Standards

1. ASTM International (ASTM)

ASTM A90	Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
ASTM A121	Metallic-Coated Carbon Steel Barbed Wire
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A392	Zinc-Coated Steel Chain Link Fence Fabric
ASTM A702	Steel Fence Posts and Assemblies, Hot Wrought

ASTM A780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM F567	Standard Practice for Installation of Chain-Link Fence
ASTM F626	Fence Fittings
ASTM F668	Standard Specification for Polvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric
ASTM F900	Industrial and Commercial Swing Gates
ASTM F1043	Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
ASTM F1083	Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.03 QUALIFICATIONS

A. Manufacturer's Qualifications: Chain link fencing and gates shall be products of a single manufacturer which has been successfully engaged in the production of such items for a period of at least five years.

B. Installer's Qualifications: Installation of the chain link fences, gates and operators shall be by the manufacturer or by a licensed contractor registered with the manufacturer.

1.04 SUBMITTALS

A. **General**: Furnish submittals in accordance with Section 01300 - Submittals.

B. Shop Drawings

1. Manufacturer's technical data, product specifications, standard details, certified product test results, installation instructions and general recommendations, including the following items:

    a. Fence assembly

    b. Gate assembly

    c. Gate hardware and accessories

2. Scaled layout of fencing and accessories, including erection/Installation drawings showing fence height, post layout, including sizes and sections; post setting and bracing configuration, details of gates and corner construction, barbed wire support arms; and other accessories which may be necessary, including the following items:

a. Fence assembly

b. Location of gate, corner, end, and pull posts

c. Location of gate operators and mounting pads for automated vehicular gates

d. Gate assembly

e. Gate hardware and accessories

3. Design calculations, fabrication details, and erection drawings of gates, including the foundations. Calculations shall be signed and stamped by a professional engineer registered in the State of California.

C. **Samples**: Samples of proposed fence components, at least 12 inches long, to illustrate the selected finish.

D. Assembly and Installation Instructions

1. Manufacturer's instructions that detail proper assembly and materials in the design for fence, gate, hardware and accessories.

2. Erection/installation drawings along with manufacturer's catalog data for complete fence assembly, gate assembly, hardware assembly and accessories.

E. **Operation and Maintenance Data**: Operating and maintenance instructions for electro-mechanical locks, including telephone numbers of the nearest service center.

1.05 FIELD MEASUREMENTS

Verify that field measurements are as indicated on shop drawings.

PART 2 -- PRODUCTS

2.01 FENCING

A. General

1. Fencing materials shall conform to the requirements of ASTM A702, ASTM F626, ASTM F668 and the following applicable supplemental requirements.

2. Dimensions indicated herein for roll-formed pipe are outside dimensions, excluding coatings.

3. Fence fabric height shall be 6 feet unless Option “B” was selected, which shall require 8 feet height.

4. Fencing materials shall be hot-dip galvanized after fabrication unless otherwise indicated.

5. Fencing shall be topped with 1 foot, three lines of barbed wire on single, vertical or 45 degree supporting arms sloping outward, as indicated.

6. Galvanized coating damaged during transit or construction of the fencing shall be repaired by application of zinc-rich cold galvanizing coating. The zinc-rich cold galvanizing coating shall contain 90 percent or more metallic zinc by weight in dry film. The coating shall be applied at sufficient wet film thickness to achieve 3 to 4 mils total dry film thickness.

7. Fused Bonded or Extruded Bonded PVC coated fencing damaged during transit or construction of the fencing shall be rejected and new material shall be provided.

B. Steel Fabric

1. Fence fabric shall be No. 11 gauge steel wire for fence height of 6 feet or No. 9 gauge steel wire for fence height of 8 feet, 2-inch mesh, with top selvages knuckled and bottom selvages twisted and barbed conforming to ASTM A116 and ASTM F668

2. Fabric Finish: Fabric shall be

    a. Galvanized in conformance with ASTM A392, Class II, with no less than 2 ounces zinc per square foot of coated surface, AND

    b. Extruded in conformance with ASTM F668, Class 2a, with polymer thickness between 0.015 in and 0.025 in, OR

    c. Fused in conformance with ASTM F668, Class 2b, with polymer coating thickness between 0.006 in and 0.010 in

C. Framing and Accessories

1. Steel Framework: Unless otherwise indicated, framework components shall be fabricated of galvanized steel conforming to ASTM F1043.

    a. Fittings and accessories shall be galvanized in accordance with ASTM A153 with zinc weights per Table I of that standard, except that no coating shall be less than 1.8 ounces zinc per square foot of coated surface.

    b. Pipe for use as structural support for fencing shall conform to ASTM F1083 and ASTM F1043, Group IA.

    c. Galvanizing repair material shall be cold-applied zinc-rich coating conforming to ASTM A780.

2. Fence Posts: Steel fence posts and assemblies shall conform to ASTM A702 and as specified.

    a. For fences 6 feet in height:

        1. Line Posts: Line posts shall be 2-inch diameter Schedule 40 pipe (3.65 pounds per linear foot), and spaced no more than 10-foot on center.

        2. Gate Posts: Gate posts shall be Schedule 40 pipe, 3-inch diameter (5.71 pounds per linear foot) for gate openings greater than 26 feet but not over 36 feet.

        3. End, Corner and Pull Posts: Posts shall be one piece without circumferential welds, 2 ½-inch diameter schedule 40 pipe (3.65 pounds per linear foot).

    b. For fences 8 feet in height:

        1. Line Posts: Line posts shall be 2 ½-inch diameter Schedule 40 pipe (5.80 pounds per linear foot), and spaced no more than 10-foot on center.

        2. Gate Posts: Gate posts shall be Schedule 40 pipe, 3-inch diameter (5.71 pounds per linear foot) for gate openings greater than 26 feet but not over 36 feet.

        3. End, Corner and Pull Posts: Posts shall be one piece without circumferential welds, 2 ½-inch diameter schedule 40 pipe (5.80 pounds per linear foot).

3. Top Rail: Top railing shall be provided in manufacturer's longest lengths, with expansion type couplings, approximately 7 inches long, for each joint. Fence design shall provide positive, secure attachment of top rail to each gate post, corner post, pull post and end post. Top rail and braces shall be 1 ¼-inch diameter Schedule 40 pipe (2.27 pounds per linear foot).

4. Tension Wire: Tension wire shall be located at the bottom of the fabric and shall consist of No. 7 gauge galvanized coil spring wire of metal and finish to match fabric. Tension wire shall be interlaced with the fabric or attached to the fabric along the extreme bottom of the fence. Tension wire attachment shall be with fabric tie wires at a spacing of no more than 18 inches apart.

5. Fabric Tie Wires: Fabric tie wires shall be No. 9 gauge galvanized steel wire of the same finish as the fabric. Ties shall be spaced 14 inches apart on posts and 18 inches on tension wires.

6. Post Brace Assembly: Post brace assembly shall be manufacturer's standard adjustable brace assembly provided at each end post, gate post and at both sides of each corner post and intermediate brace post. Material used for brace shall be same as top rail. Truss bracing between line posts shall be achieved with ⅜-inch diameter rod and adjustable tensioner.

7. Post Tops: Post tops shall be weather-tight closure caps, designed for containment of top rail and positive permanent attachment to post. One cap shall be provided for each post.

8. Stretcher Bars: Stretcher bars shall be one-piece lengths equal to the full height of the fabric, with minimum cross-section of ¼-inch by ¾-inch. One stretcher bar shall be provided for each gate and end post, and two for each corner and intermediate brace post.

9. Stretcher Bar Bands: Stretcher bar bands shall be one-piece fabrications designed to secure stretcher bars to end, corner, intermediate brace, and gate posts. Bands shall have a minimum cross-section of 1/8-inch by 1-inch. Stretcher bar bands shall be spaced no more than 16-inch on center.

10. Barbed Wire Supporting Arms: Supporting arms shall be manufacturer's standard fabrication, of metal and finish to match fence framework, with provision for anchorage to each post and attachment of three rows of barbed wire to each arm. Supporting arms may be either attached to posts or integral with post top weather cap. Supporting arm shall be single, vertical or 45-degree arm type as indicated and shall be capable of withstanding 250 pounds of downward pull at outermost end.

11. Barbed Wire: Barbed wire shall be galvanized and conform to ASTM A121, chain link fence grade. Barbed wire shall be 3-strand, No. 12-½ gauge zinc-coated steel or iron wire with four-point barbs of No. 14 gauge wires spaced no more than 5 inches apart.

12. Fittings: All fence and gate fittings shall be galvanized malleable cast iron or pressed steel in compliance with ASTM F626. Fabric shall be secured to all terminal posts with 5/16-inch diameter hook bolts, specifically designed for that purpose. Fabric shall be secured to all top and/or bottom tension wires with 9-gauge aluminum hog rings.

13. Concrete Footings: Concrete for post footings shall be 3,000 psi in accordance with Section 03300 - Cast-in-place Concrete. Unless otherwise indicated, the dimensions of the concrete footing shall be as follows: four (4) times greater than the outside diameter or the largest cross-section of the posts up to a 4 inch diameter and three (3) times for larger diameters in accordance with ASTM F567 with a minimum diameter of 12 inches. Depths of the footings shall be 6 inches deeper than the post bottom, with a minimum depth of 36 inches.

2.02 GATES

A. General

1. Gate assembly shall conform to ASTM F900 and/or ASTM F1184 of the type of the gate system shown and the following supplemental requirements.

2. Gates shall have smooth bottom edges.

B. Swing Gates

1. Perimeter frames of swing gates shall be constructed of the same pipe as the top rails and shall be fabricated by welding. Welds shall be ground smooth prior to hot-dip galvanizing.

2. Fabrication: Perimeter frames of gates shall be fabricated from same metal and finish as the fence framework specified in Paragraph 2.1 C.

    a. Gate frames shall be assembled by welding or with fittings and rivets for rigid, secure connections. Welds shall be ground smooth. Gate frames and any un-galvanized hardware, shall be hot-dip galvanized after fabrication. Horizontal and vertical members shall be provided to ensure proper gate operation and attachment of fabric, hardware and shall be hot-dip galvanized after fabrication.

    b. The gate filler shall be chain link fabric matching the fence fabric. Fabric shall be installed with stretcher bars at all perimeter edges. Stretcher bars shall be attached to gate frame with stretcher bar bands spaced no more than 16-inch on center.

    c. Each gate shall be diagonally cross-braced with a ⅜-inch diameter adjustable length truss rod to ensure frame rigidity without sag or twist.

    d. Where barbed wire is indicated above gates, vertical members shall be extended and fabricated as required to receive barbed wire supporting arms.

3. Hardware and accessories shall be provided for each gate, galvanized in conformance with ASTM A153 and in accordance with the following supplementary requirements.

    a. Hinges: Hinges shall be of size and material to suit gate size, non-lift-off type, offset to permit 180-degree gate opening. Three hinges shall be provided for each leaf 6 feet or more in height. Two hinges shall be provided for each leaf less than 6 feet in height.

    b. Latch: Latch shall be forked type or plunger-bar type, permitting operation from either side of the gate, with padlock eye as an integral part of the latch. A latch assembly is not required if an electro-mechanical or a mechanical gate lock is indicated to be installed. Latch assemblies are not required for automated gates.

c. Keeper: Keeper shall be provided which automatically engages the gate leaf and holds it in the open position until it is manually released.

d. Double Gates: Gate stops shall be provided for double gates, consisting of mushroom type flush plate with anchors, set in concrete, and designed to engage center drop rod or plunger bar. Locking device and padlock eyes shall be provided as an integral part of the latch, permitting both gate leaves to be locked with a single padlock.

e. The gate shall be designed and installed so as to not create an entrapment area between the gate and other fixed objects.

f. The pillar or column covered by the swing gate when in the open position shall not exceed 4 inches.

2.03 MANUFACTURERS OR EQUAL

A. Fences and Gates

1. **Swan Fence, Inc.**

2. **Master Halco**

B. Zinc-Rich Cold Galvanizing Coating

1. **Carboxane, Carboline Co**.

2. **Cold Galvanizing Compound, ZRC**

PART 3 -- EXECUTION

3.01 INSPECTION

A. Prior to commencing installation, require Installer to inspect all areas and conditions within which Work of this Section will be performed. Dimensions and clearances shall be verified. Final grading shall be completed and all earth, brush, or other obstructions which interfere with the proper alignment and construction of fencing shall be removed.

3.02 INSTALLATION

A. General:

1. All trees, brush, and other obstacles which interfere with construction of fencing shall be removed or relocated as directed by Owner. Ground surface shall be leveled so that fabric can be installed without ground interference. High points shall be excavated and low points shall be filled and compacted (85% relative compaction). Prior to fence construction bottom of fabric shall range between 1 and 2 inches above ground.

2. Installation of chain link fence and appurtenances shall comply with ASTM F567. Unless otherwise indicated, all posts shall be set in concrete. Gate and related posts, corner posts, and other critical elements shall be provided with concrete foundations to safely accommodate the loads to which they will be subjected.

B. Excavation: Holes for posts shall be drilled or hand excavated to the diameters and spacing as indicated, in firm, undisturbed or compacted soil. Post foundations which are not designed by an engineer shall comply with the following:

1. Holes shall be excavated to a diameter no less than 8 inches or no less than three times the largest dimension of the item being anchored, whichever is larger.

2. Depth for holes shall be no less than 36 inches for fence height of 6 feet and 42 inches for fence height of 8 feet; excavated approximately 6 inches lower than the post bottom, with bottom of posts set no less than 36 inches below finished grade surface.

C. Post Setting:

1. Fence Posts

a. Line posts shall be spaced at not more than 10-foot intervals, measured from center to center of the posts, parallel to the ground slope. Posts shall be set plumb and shall be centered in holes, 3 inches above the bottom of the excavation, with posts extending no less than 36 inches below finished grade surface.

b. Corner posts shall be installed where changes in the fence lines equal or exceed 15 degrees, measured horizontally.

c. Each post shall be properly aligned vertically and its top aligned parallel to the ground slope. Posts shall be maintained in proper position during placement and finishing operations.

2. Gate Posts

a. Gate posts shall be installed per gate manufacturer's recommendations.

3. Concrete Footings

a. Concrete for footings may be placed without forms, providing the ground is firm enough to permit excavation to neat line dimensions. Prior to placing concrete, the earth around the hole shall be thoroughly moistened.

b. Encasement concrete for footings shall be placed immediately after mixing in a manner such that there will be no concentration of the large aggregates. The concrete shall be consolidated by tamping or vibrating.

c. Concrete footings shall have a neat appearance and shall be extended 2 inches above grade and troweled to a crown to shed water.

d. A minimum of seven days shall elapse after placing the concrete footings before the fence fabric or barbed wire is fastened to the posts.

D. Bracing: Bracing shall be provided at all ends, corners, gates, and intermediate brace posts. Corner posts and intermediate brace posts shall be braced in both directions. Horizontal brace rails shall be set midway between the top rail and the ground, running from the corner, end, intermediate brace or gate post to the first line post. Diagonal tension members shall connect tautly between posts below horizontal braces. Braces shall be so installed that posts remain plumb when diagonal rod is under proper tension.

E. Intermediate Brace Posts: Where straight runs of fencing exceed 3000 feet, intermediate brace posts shall be installed, spaced equally between ends or corners; with additional posts provided as required, such that the spacing between intermediate brace posts does not exceed 300 feet. Intermediate brace posts shall be equivalent in size to corner posts and shall be braced with horizontal brace rails and diagonal tension members in both directions.

F. Top Rails: Top rails shall be run continuously through post caps, bending to radius for curved runs. Expansion couplings shall be provided as recommended by the fencing manufacturer.

G. Center Rails: Center rails shall be provided where indicated. Rails shall be installed in one piece, between posts and flush with posts on fabric side, using special offset fittings where necessary.

H. Tension Wire: Continuous bottom tension wire shall be stretched tight with turnbuckles at end, gate, intermediate, and corner posts. Tension wire shall be installed on a straight grade between posts, with approximately 2 inches of space between finished grade and bottom selvage, unless otherwise indicated. Tension wire shall be tied to each post with no less than No. 9 gauge galvanized wire.

I. Fabric:

1. Chain-link fabric shall be fastened on the secured side of the posts.

2. Fabric shall be stretched and securely fastened to posts. Between posts, top and bottom edges of the fabric shall be fastened to the top rail and bottom tension wire, respectively.

3. Fabric shall be stretched and anchored in such a manner that it remains in tension after the pulling force is released.

J. Tie Wires: Tie wire shall be bent to conform to the diameter of the pipe to which it is attached, clasping pipe and fabric firmly with ends twisted at least two full turns. Ends of wire shall be bent back to minimize hazard to persons or clothing.

1. Fabric shall be tied to line posts with tie wires spaced at 14-inch on center.

2. Fabric shall be tied to rails and braces with tie wires spaced at 24-inch on center.

3. Fabric shall be tied to tension wires, with hog rings spaced 18-inch on center.

K. Stretcher Bars: Fabric shall be fastened to end, corner, intermediate brace, and gate posts with stretcher bars. Bars shall be threaded through or clamped to fabric at 4- inch on center and secured to posts with stretcher bar bands spaced no more than 16- inch on center.

L. Fasteners: Nuts for tension bands and hardware bolts shall be installed on the side of fence opposite the fabric side. Ends of bolts shall be peened or the threads scored to prevent removal of nuts.

M. Galvanized Coating damaged during transit or construction of the fencing shall be repaired by application of zinc-rich cold galvanizing coating in accordance with the manufacturer's printed instructions.

3.03 GATE

A. All exposed entrapment and pinch points shall be eliminated or guarded. It is the responsibility of the Contractor to indentify these points.

B. Manual Gates

1. Gates shall be installed plumb, level, secured for full opening without interference. Gate movement shall not be initiated by gravity when in an at rest position.

2. Hardware shall be installed in a manner which will prevent unauthorized removal.

3. Gates and hardware shall be adjusted to provide for smooth operation.

4. All gate installations shall conform to ASTM F-567 and ASTM 1184 as well as all applicable federal, state and local codes.

3.04 GROUNDING

A. Fences crossed by power lines shall be grounded at or near the point of crossing and at distances not exceeding 200 feet on each side of the crossing. Ground connections shall be made to the main ground grid system with No. 2/0 AWG bare annealed conductor suitable for direct burial.

B. Fences, gates and appurtenances enclosing electrical equipment areas, gas yards, or other hazardous areas shall be electrically continuous and grounded.

C. Ground conductor shall consist of No. 2/0 AWG bare annealed copper conductor suitable for direct burial. Grounding electrodes shall be ½-inch by 8-foot long copper-clad steel rod. Electrodes shall be driven into the earth so that the top of the electrode is at least 6 inches below grade. Where driving is impracticable, electrodes shall be buried a minimum

of 12 inches deep and radically from the fence. Top of electrode shall be no less than 2 feet or more than 8 feet from the fence.

D. Ground conductor shall be clamped to the fence and electrodes with bronze grounding clamps so as to create electrical continuity between fence posts, fence fabric, and ground rods. After installation, the total resistance of fence to ground shall not be greater than 5 ohms.

3.05 SECURITY

A. The Contractor shall remove existing security fencing, install new security fencing, and perform related work required to provide continuous security for the plant facility.

B. The Contractor shall schedule and fully coordinate work with the Owner.

3.06 CLEANUP

A. Remove waste fencing materials and other debris from the Site each workday.

END OF SECTION 02444

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SECTION 03300

BASIC CONCRETE SPECIFICATIONS

PART 1 - GENERAL

1.01 General Requirements

A. Contractor shall furnish all materials for concrete in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished concrete, all in accordance with the requirements of the Contract Documents.

B. All cast-in-place concrete falls into one of the following categories and shall comply with all requirements of this basic specification.

1. Structural Concrete (or Class "A" Concrete). Concrete to be used in all cases except where noted otherwise in the Contract Documents.

2. Sitework Concrete (or Class "B" Concrete). Concrete to be used for curbs, gutters, catch basins, sidewalks, pavements, fence and guard post embedment, underground duct bank encasement and all other concrete appurtenant to electrical facilities unless otherwise shown.

3. Lean Concrete (or Class "C" Concrete). Concrete to be used for thrust blocks, pipe trench cut-off blocks and cradles, where the preceding items are detailed on the drawings as unreinforced. Concrete to be used as protective cover for dowels intended for future connection.

C. Only one class of concrete shall be present at the job site at any one time.

1.02 Reference Specifications, Codes, and Standards

A. Specifications

Items specified elsewhere in these Contract Documents:

Concrete Formwork - See Section 03100, Basic Concrete Formwork Specifications.

B. Codes

The Building Code, as referenced herein, shall be the California Building Code (CBC), of the California Building Standards Commission, latest edition.

C. Commercial Standards

Where not covered in this specification, all work shall comply with the following standards, latest editions:

ACI 214	Evaluation of Strength Test Results of Concrete
ACI 301	Specifications for Structural Concrete
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 347	Guide to Formwork for Concrete
ACI 318	Building Code Requirements for Structural Concrete and Commentary
ACI 350	Code Requirements for Environmental Engineering Concrete Structures and Commentary
ASTM C 494	Standard Specification for Chemical Admixtures for Concrete

1.03 Contractor Submittals

All submittals shall be in accordance with the Section 01300, Contractor Submittals Technical Specifications.

A. Mix Designs

Prior to beginning the work, Contractor shall submit to Engineer, for review, preliminary concrete mix designs which shall show the proportions and gradations of all materials proposed for each class and type of concrete to be used on the job. The mix designs shall be designed by an independent testing laboratory acceptable to Engineer. All costs related to such mix design shall be borne by the Contractor.

B. Certified Delivery Tickets

Where ready-mix concrete is used, Contractor shall provide certified delivery tickets at the time of delivery of each load of concrete. Each certificate shall show the total quantities (by weight) of cement, sand, each class of aggregate, and

admixtures, and the amounts of water (by gallons) in the aggregate and added at the batching plant as well as the amount of water allowed to be added at the site for the specific design mix. Each certificate shall, in addition, state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to when the batch was dispatched, when it left the plant, when it arrived at the job, the time that unloading began, and the time that unloading was finished.

1.04 Quality Assurance

A. Tests on component materials and for compressive strength of concrete will be performed as specified herein. Test for determining slump will be in accordance with the requirements of ASTM C 143.

B. The cost of all laboratory tests on concrete will be borne by the Owner. However, Contractor shall be charged for the cost of any additional tests and investigation on work performed which fails to meet specification.

C. Concrete for testing shall be supplied by Contractor at no cost to the Owner, and Contractor shall provide assistance to the Engineer in obtaining samples, and disposal and cleanup of excess material.

D. Field Compression Tests

1. Compression test specimens will be taken during construction from the first placement of each class of concrete specified herein and at intervals thereafter as selected by the Engineer to insure continued compliance with these specifications. Each set of test specimens will be a minimum of 4 cylinders.

2. Compression test specimens for concrete shall be made in accordance with ASTM C 31. Specimens shall be 6" diameter by 12" high cylinders.

3. Compression tests shall be performed in accordance with ASTM C 39. One test cylinder will be tested at 7 days and two will be tested at 28 days.

   The remaining cylinder will be held to verify test results, if needed.

E. Evaluation and Acceptance of Concrete

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 350, Chapter 5, "Concrete Quality, Mixing, and Placing", and as specified herein.

2. If any concrete fails to meet these requirements, immediate corrective action shall be taken to increase the compressive strength for all subsequent batches of the type of concrete affected.

3. All concrete which fails to meet the ACI requirements and these specifications is subject to removal and replacement at the cost of the Contractor.

F. Construction Tolerances

Contractor shall set and maintain concrete forms and perform finishing operations so as to insure that the completed work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Where tolerances are not stated in the specifications, permissible deviations will be in accordance with ACI 347.

G. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise shown:

Item	Tolerance
Variation of the constructed linear outline from the established position in plan	In 10 feet: 1/4 inch; In 20 feet or more: 1/2 inch
Variation from the level or from the grades shown	In 10 feet: 1/8 inch; In 20 feet or more: 1/4 inch
Variation from the plumb	In 10 feet: 1/8 inch; In 20 feet or more: 1/4 inch
Variation in the thickness of slabs and walls	Minus 1/4 inch; Plus 1/2 inch
Variation in the locations and sizes of slab and wall openings	Plus or minus 1/4 inch

Regardless of the tolerances listed herein, it shall be the responsibility of the Contractor to limit deviations in line and grade to tolerances which will permit proper installation and operation of mechanical equipment and piping.

PART 2 - PRODUCTS

2.01 Concrete Materials

A. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.

B. All materials furnished for the work shall comply with the requirements of Section 4.2.1 of ACI 301.

C. Storage of materials shall conform to the requirements of Section 4.1.4 of ACI 301.

D. Materials for concrete shall conform to the following requirements:

1. Cement shall be standard brand portland cement conforming to ASTM C 150 for Type II or Type V. Portland cement shall contain not more than 0.60 percent alkalies. A single brand of cement shall be used throughout the work, and prior to its use, the brand shall be acceptable to the Engineer. The cement shall be suitably protected from exposure to moisture until used. Cement that has become lumpy shall not be used. Stacked cement shall be stored in such a manner so as to permit access for inspection and sampling. Certified mill test reports for each shipment of cement to be used shall be submitted to the Engineer if requested regarding compliance with these specifications.

2. Fly Ash or other pozzolans are not permitted as a component in the concrete mix.

3. Water shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts and other impurities. The water shall be considered potable, for the purposes of this section only, if it meets the requirements of the local governmental agencies. Agricultural water with high total dissolved solids (over 1000 mg/l TDS) shall not be used.

4. Aggregates shall be obtained from pits acceptable to the Engineer, shall be non-reactive, and shall conform to ASTM C 33. Maximum size of coarse aggregate shall be as specified in Paragraph 2.07B herein. Lightweight sand for fine aggregate will not be permitted.

    a. Coarse aggregates shall consist of clean, hard, durable gravel, crushed gravel, crushed rock or a combination thereof. The coarse aggregates shall be prepared and handled in two or more size

groups for combined aggregates with a maximum size greater than 3/4". When the aggregates are proportioned for each batch of concrete the two size groups shall be combined.

b. Fine aggregates shall be natural sand or a combination of natural and manufactured sand that are hard and durable.

c. Combined aggregates shall be well graded from coarse to fine sizes, and shall be uniformly graded between screen sizes to produce a concrete that has optimum workability and consolidation characteristics. Where a trial batch is required for a mix design, the final combined aggregate gradations will be established during the trial batch process.

5. Ready-mix concrete shall conform to the requirements of ASTM C 94.

6. Air-entraining agent meeting the requirements of ASTM C 260, shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 4 to 6 percent; provided that, when the mean daily temperature in the vicinity of the worksite falls below 40°F for more than one day, the total air content provided shall be 5 to 7 percent. The Owner reserves the right, at any time, to sample and test the air-entraining agent received on the job by the Contractor. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement.

7. Admixtures shall be required as stated herein and at the Engineer's discretion or, if not required, may be added at the Contractor's option to control the set, effect water reduction, and increase workability. In either case, the addition of an admixture shall be at the Contractor's expense. The use of an admixture shall be subject to acceptance by the Engineer. Concrete containing an admixture shall be first placed at a location determined by the Engineer. If the use of an admixture is producing an inferior end result, Contractor shall discontinue use of the admixture. Admixtures specified herein shall conform to the requirements of ASTM C 494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used. Admixtures shall contain no free chloride ions, be non-toxic after 30 days, and shall be compatible with and made by the same manufacturer as the air entraining admixture.

a. Low range water reducer shall be used in all structural and sitework concrete and shall conform to ASTM C 494, Type A. It shall be either a hydroxylated carboxylic acid type or a hydroxylated polymer type. The quantity of admixture used and

the method of mixing shall be in accordance with the manufacturer's instructions and recommendations.

b. Set controlling admixture shall be either with or without water-reducing properties. Where the air temperature at the time of placement is expected to be consistently over 80°F, a set retarding admixture such as Sika Chemical Corporation's Plastiment, BASF's Pozzolith 300R, or equal shall be used. Where the air temperature at the time of placement is expected to be consistently under 40°F, a set accelerating admixture such as Sika Chemical Corporation's Plastocrete 161FL, BASF's Pozzolith 122HE, or equal shall be used.

c. High range water reducer may be used if approved by Engineer. If allowed it shall be sulfonated polymer conforming to ASTM C 494, Type F or G.

High range water reducing agent shall only be added to the concrete at the batch plant. It shall be second generation type, Daracem 100 as manufactured by W.R. Grace & Co., Rhedbuild 1000 as manufactured by BASF, or equal. High range water reducer shall be added to the concrete after all other ingredients have been mixed and initial slump has been verified.

Concrete shall be mixed at mixing speed for a minimum of 30 mixer revolutions after the addition of the high range water reducer.

8. Calcium Chloride shall not be added to or used in concrete.

9. Floor Hardener shall be provided where specified on the Drawings. Floor hardener shall be natural aggregate dry shake hardener for concrete. Hardener shall be composed of crushed, washed, and specially graded quartz silica aggregate, cementitious binders, plasticizers, dispersing agents and stable colorants. Contractor shall coordinate adjustments in concrete mix design necessary to accommodate proposed floor hardener, including air entrainment and admixtures. Unless specified otherwise, hardener color shall be natural light gray.

Floor hardener shall be ConColor by ChemMasters, Lithochrome by L.M. Scofield Co., Colorcron by Master Builders, or equal. Floor hardener shall be applied in strict accordance with the manufacturer's printed instructions.

2.02 Curing Materials

Materials for curing concrete shall conform to the following requirements:

A. Concrete curing compound shall be Resi-Chem manufactured by Symons, or approved equal. The curing compound shall contain a fugitive dye so that areas of application will be readily distinguishable.

B. Polyethylene sheet for use as concrete curing blanket shall be white, and shall have a nominal thickness of 6 mils. The loss of moisture when determined in accordance with the requirements of ASTM C 156 shall not exceed 0.055 grams per square centimeter of surface.

C. Polyethylene-coated waterproof paper sheeting for use as concrete curing blanket shall consist of white polyethylene sheeting free of visible defects, uniform in appearance, having a nominal thickness of 2 mils and permanently bonded to waterproof paper conforming to the requirements of Federal Specification UU-B-790A (Int. Amd. 1). The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 gram per square centimeter of surface.

D. Polyethylene-coated burlap for use as concrete curing blanket shall be 4 mil thick, white opaque polyethylene film impregnated or extruded into one side of the burlap. Burlap shall weigh not less than 9 ounces per square yard. The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 grams per square centimeter of surface.

E. Curing mats for use in Curing Method 6 as specified in Paragraph 3.09G herein, shall be heavy shag rugs or carpets or cotton mats quilted at 4" on center. Curing mats shall weigh a minimum of 12 ounces per square yard when dry.

F. Evaporation retardant shall be a material such as Confilm as manufactured by BASF, Cleveland, OH; or equal.

2.03 Waterstop

A. Contractor shall provide waterstops at all construction and expansion joints in all water holding structures. Waterstop shall be Greenstreak PVC Style 732, 6" wide, or Style 735, 9" wide, as specified on Drawings.

B. Contractor shall heat fuse joints and connections in strict compliance with manufacturer's instructions using heating tools and devices recommended by same. Waterstops shall be continuous in joints, following offsets and angles in joint until spliced to waterstops at intersecting joints, completely sealing the structure. Waterstops shall be aligned and centered in joints. Contractor shall

secure flanges of waterstops to reinforcing bars with 18 gauge wire ties spaced maximum 18" on center. Waterstop joints shall be properly heat-spliced at ends and crosses to preserve continuity. Contractor shall locate waterstops where shown on drawings and in all waterbearing walls and slabs where common to: earth-bearing or earth-support; occupied areas; or above-grade exposed surfaces.

C. All joints with waterstops involving more than 2 ends to be jointed together, and all joints which involve an angle cut, alignment change, or the joining of 2 dissimilar waterstop sections shall be prefabricated by the Contractor prior to placement in the forms, allowing not less than 24" long strips of waterstop material beyond the joint. Upon being inspected and approved, such prefabricated waterstop joint assemblies shall be butt welded to the straight run portions of waterstop.

D. Waterstop splices shall have a tensile strength of not less than 60 percent of the unspliced materials tensile strength.

2.04 Expansion Joints

A. Contractor shall provide expansion joints where indicated on Construction Drawings. Expansion joints shall consist of joint filler material and joint sealant. Filler material shall be held down 1/2" for sealant unless otherwise shown.

B. Expansion joint filler material shall be performed sponge neoprene or cork conforming to ASTM D 1752. Filler material containing asphalt shall not be used.

2.05 Joint Sealant

A. Joint sealant for use in construction, control, and expansion joints shall be Sika-Flex 1a as supplied by the Sika Corporation, or approved equal.

Joint primer shall be as produced and/or recommended by sealant manufacturer.

B. Contractor shall clean all locations where sealant is placed by sandblasting and be free from oil, foreign materials, and moisture. Lower surfaces of joints shall be isolated with a bond breaker such as polyethylene, polyethylene tape, or equal as recommended by sealant manufacturer.

C. Sealant shall be placed in strict accordance with manufacture's recommendations by a firm specializing in this type of work, or by the Contractor under direct supervision of the manufacturer. If the Contractor chooses to apply sealant, manufacturer's technical representative shall be present at the beginning of sealant placement to observe and advise on methods for mixing, joint preparation, and application of sealant.

2.06 Concrete Bond Breaker

A. Bond breaker shall be Spec Tilt WB Bond Breaker as manufactured by SpecChem; Tilt-EEZ WB Bond Breaker as manufactured by Conspec; or approved equal. It shall contain a fugitive dye so that areas of application will be readily distinguishable.

B. Contractor shall strictly follow manufacturer's application guidelines. Just prior to application, joint shall be thoroughly soaked so that concrete contains approximately the same surface moisture as newly cast concrete. Bond breaker shall be brush applied with a minimum of two coats. Extreme care must be taken to prevent any bond breaker from contacting waterstops. If necessary, wrap waterstop during bond breaker application.

2.07 Concrete Design Requirements

A. General

Concrete shall be composed of cement, admixtures, aggregates and water. These materials shall be of the qualities specified. The exact proportions in which these materials are to be used for different parts of the work will be determined during the trial batch. In general, the mix shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface. Mix designs shall not contain more than 43 percent of sand of the total weight of fine and coarse aggregate. The aggregate gradations shall be formulated to provide fresh concrete that will not promote rock pockets around reinforcing steel or embedded items. The proportions shall be changed whenever necessary or desirable to meet the required results at no additional cost to the Owner. All changes shall be approved by Engineer.

B. Water-Cement Ratio and Compressive Strength

The minimum compressive strength and cement content of concrete shall be not less than that specified in the following tabulation.

Type of Work	Min. 28-Day Compressive Strength (psi)	Max. Size Aggregate (in.)	Min. Cement per cu yd (sacks)	Max. W/C Ratio (by wt.)
Structural Concrete (Class "A"):				
Walls, floor slabs, columns, and footings of hydraulic (water or wastewater) bearing structures	4,000	1	6.2	0.45
Walls, roof slabs, floor slabs, columns, and footings and all other concrete items not specified elsewhere	4,000	1	6.2	0.48
Sitework concrete (Class "B"):	3,000	1	5.5	0.52
Lean concrete (Class "C"):	2,000	1	4.0	0.60

Note: One sack of cement equals 94 lbs.

C. Adjustments to Mix Design

Mixes used shall be changed whenever such change is necessary or desirable to secure required strength, density, workability, and surface finish and Contractor shall be entitled to no additional compensation because of such changes. Approval shall be obtained from Engineer prior to any changes.

2.08 Consistency

The quantity of water entering into a batch of concrete shall be just sufficient, with a normal mixing period, to produce concrete which can be worked properly into place without segregation, and which can be compacted by vibratory methods herein specified to give desired density, impermeability and smoothness of surface. The quantity of water shall be changed as necessary, with variations in the nature of moisture content of the aggregates, to maintain uniform production of desired consistency. The consistency of the concrete in successive batches shall be determined by slump tests in accordance with ASTM C 143. The slumps shall be as follows:

Part of Work	Slump
Structural concrete	3" (±1")
Other work	4" (±1")
With high range water reducer added	8" max.

2.09 Ready-Mixed Concrete

A. At Contractor's option, ready-mixed concrete may be used provided it meets all requirements as to materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C 94, including the supplementary requirements specified in Paragraphs 2.09B through 2.09F herein.

B. Ready-mixed concrete shall be delivered to the site of the work, and discharge shall be completed within 90 minutes after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first. In hot weather (ambient temperature above 95°F) or under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85°F or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed 45 minutes.

C. Truck mixers shall be equipped with electrically-actuated counters by which the number of revolutions of the drum or blades may be readily verified. The counter shall be of the resettable, recording type, and shall be mounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

D. Each batch of concrete shall be mixed in a truck mixer for not less than 70 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolution of mixing.

E. Truck mixers and their operation shall be such that the concrete throughout the mixed batch as discharged is within acceptable limits of uniformity with respect to consistency, mix, and grading. If slump tests taken at approximately the 1/4 and 3/4 points of the load during discharge give slumps differing by more than 1" when the specified slump is 4" or less, or if they differ by more than 2" when the specified slump is more than 4", the mixer shall not be used on the work unless the causing condition is corrected and satisfactory performance is verified by additional slump tests. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed of rotation, general mechanical condition of the unit, and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.

F. Each batch of ready-mixed concrete delivered at the job site shall be accompanied by a certified weighmaster delivery ticket furnished to the Engineer in accordance with Paragraph 1.03B herein.

G. Non-agitating equipment for transporting ready-mixed concrete shall not be used. Combination truck and trailer equipment for transporting ready-mixed concrete shall not be used. The quality and quantity of materials used in ready-mixed concrete and in batch aggregates may be subject to continuous inspection at the batching plant by the Engineer.

H. Transit mix trucks delivering concrete to the site shall have full water tanks upon arrival at the site. Any addition of water must be approved by Engineer. Added water must be incorporated by additional mixing of at least 35 revolutions.

PART 3 - EXECUTION

3.01 Proportioning and Mixing

A. Proportioning

Proportioning of the concrete mix shall conform to the requirements of Section 4.2.3 of ACI 301; provided, that the maximum slump for any concrete shall not exceed 4" except when the use of high range water reducer is permitted which increases the maximum slump to 8".

B. Mixing

Mixing of concrete shall conform to the requirements of Section 4.3.1 of ACI 301 specifications.

C. Slump

Maximum slumps shall be as specified in Paragraph 2.08A herein.

D. Retempering

Concrete or mortar which has partially hardened shall not be retempered.

3.02 Preparation of Surfaces for Concreting

A. General

Earth surfaces shall be thoroughly wetted by sprinkling, prior to placing any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. These surfaces shall be free from standing water, mud, and debris at the time of placing concrete.

B. Joints in Concrete

The location of all construction joints not specifically noted or shown shall be approved by Engineer. Concrete surfaces upon or against which concrete is to be placed, where the placement of the old concrete has been stopped or interrupted so that, as determined by the Engineer, the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints. The surfaces of horizontal joints shall be given a compacted, roughened surface for good bond. Except where the drawings call for joint surfaces to be coated, the joint surfaces shall be cleaned of all laitance, loose or defective concrete, and foreign material. Such cleaning shall be accomplished by sandblasting to remove laitance and to provide a uniform surface texture with approximately 1/4" of surface sandblasted off. Sandblasting shall be followed by thorough washing. All pools of water shall be removed from the surface of construction joints before the new concrete is placed.

C. Placing Interruptions

When placing of concrete is to be interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means, that will secure proper union with subsequent work; provided that construction joints shall be made only where acceptable to the Engineer.

D. Embedded Items

1. Concrete shall not be placed until all formwork, installation of parts to be embedded, reinforcement steel, and preparation of surfaces involved in the placing have been completed and accepted by the Engineer at least 4 hours

before placement of concrete. All surfaces of forms and embedded items that have become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.

2. All reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms where shown on Contract Drawings and shall be acceptable to the Engineer before any concrete is placed. Accuracy of placement is the responsibility of the Contractor.

3. Anchor Bolts shall be accurately set, and shall be maintained in position by templates while being embedded in concrete.

4. Concrete anchor bolts and expansion anchors shall be ASTM type A-316 stainless steel and shall be inserted to the minimum depths listed below, unless noted otherwise:

Size	Reinforced Concrete
1/4"	3"
3/8"	4"
1/2"	5"
3/4"	6"

5. Expansion anchors shall be stainless steel Hilti Kwik Bolt T2, or equal.

6. All smooth dowels shall have at least one side coated with a bond breaker. Dowel bond breaker shall be a heavy duty industrial grease hand applied. A wax paper or PVC sleeve may be used at the Contractor's option if specifically manufactured to create slip dowels. Paper tubing shall be multi-ply stock and heavily impregnated with paraffin. Maximum sleeve thickness shall be 1/16" and sleeve shall fit snugly over dowel.

E. Casting New Concrete Against Old

1. Where new concrete is to be cast against existing (old) concrete (concrete which is greater than 60 days of age), surfaces of old concrete shall be roughened by mechanical means to provide an aggregate-fractured surface with a 1/4" (min.) profile and cleaned of all loose concrete and dust. The remaining surface shall be saturated in advance of concrete placement but be free of standing water. A bonding agent such as Sika Armatec 110 shall be applied to the interface between old and new concrete just prior to concrete placement.

2. Overlays of existing concrete and repair of holes, cavities, and depressions in existing concrete due to removal of existing facilities or installation of new facilities shall be as follows:

   a. Remaining concrete surfaces shall be prepared as specified in Paragraph 3.02E.1 herein.

   b. A bonding agent shall be applied to all concrete and metal surfaces to receive repair mortar or concrete. Bonding agent shall be Sika Armatec 110, or equal.

   c. Overlays, holes, cavities, and depressions shall be filled with Sika Monotop 611 mortar, or equal. For placements greater than 1" in depth, 3/8" coarse aggregate shall be added to the mortar to create a repair concrete. Vertical surfaces shall be formed. Horizontal surfaces, including slab overlays, shall be hand trolled and finished to match adjacent concrete.

   d. Bonding agent and repair mortar/concrete shall be mixed and installed in strict accordance with the manufacturer's printed instructions.

F. Concrete shall not be placed in any old or new structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the forms, clear of the work. Concrete shall not be deposited underwater nor shall the Contractor allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such a manner and at such velocity as to injure the surface finish of the concrete. Contractor shall provide pumping or other necessary dewatering operations for removing groundwater, if required, with methods subject to review by Engineer.

G. Corrosion Protection

Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2" clearance between said items and any part of the concrete reinforcement. Contractor shall not secure such items in position by wiring or welding them to the reinforcement.

H. Cleaning

Surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before concrete is placed.

3.03 Handling, Transporting, and Placing

A. General

Placing of concrete shall conform to the applicable requirements of Section 5.3.2 of ACI 301 and the requirements of this Section.

B. Non-Conforming Work or Materials

Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the work. Concrete which is not placed in accordance with these specifications, or which is of inferior quality, shall be removed and replaced by and at the expense of the Contractor.

C. Unauthorized Placement

Concrete shall not be placed except in the presence of duly authorized representative of the Engineer. Contractor shall notify Engineer at least 24 hours in advance of placement of any concrete.

D. Placement in Wall Forms

Concrete shall not be dropped through reinforcement steel or into any deep form, whether reinforcement is present or not, causing separation of the coarse aggregate from the mortar on account of repeatedly hitting rods or the sides of the form as it falls, nor shall concrete be placed in any form in such a manner as to leave accumulation of mortar on the form surfaces above the placed concrete. In such cases, some means such as the use of hoppers and, if necessary, vertical ducts of canvas, rubber, or metal shall be used for placing concrete in the forms in a manner that it may reach the place of final deposit without separation. In no case shall the free fall of concrete exceed 4' below the ends of ducts, chutes, or buggies. Concrete shall be uniformly distributed during the process of depositing and in no case after depositing shall any portion be displaced in the forms more than 6' in horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 2'; and Contractor shall take care to avoid inclined layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft.

E. Placement in Slabs

Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement. As the work progresses,

concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.

F. Temperature of Concrete

Temperatures of concrete when it is being placed shall be not more than 90°F nor less than 40°F in moderate weather, and not less than 50°F in weather during which the mean daily temperature drops below 40°F. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90°F, Contractor shall employ effective means, such as precooling of aggregates and mixing water using ice or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90°F. Contractor shall be entitled to no additional compensation on account of the foregoing requirements.

G. Cold Weather Placement

Earth foundations shall be free from frost or ice when concrete is placed upon or against them. Fly ash concrete shall not be placed when the air temperature falls below 50°F.

3.04 Pumping of Concrete

A. General

If the pumped concrete does not produce satisfactory end results, Contractor shall discontinue the pumping operation and proceed with the placing of concrete using conventional methods.

B. Pumping Equipment

Pumping equipment must have 2 cylinders and be designed to operate with one cylinder only in case the other one is not functioning. In lieu of this requirement, Contractor may have a standby pump on the site during pumping.

C. The minimum diameter of hose (conduits) shall be 4".

D. Contractor shall replace pumping equipment and hoses (conduits) that are not functioning properly.

E. Contractor shall not use aluminum conduits for conveying the concrete.

F. Proportioning

Minimum compressive strength, cement content, and maximum size of aggregates shall be as specified in Paragraph 2.07 herein.

G. Gradation of coarse aggregates shall conform to ASTM C 33 and shall be as close to the middle range as possible.

H. Gradation of fine aggregate shall conform to ASTM C 33, with 15 to 30 percent passing the number 50 screen and 5 to 10 percent passing the number 100 screen. The fineness modules of sand used shall not be over 3.00.

I. Water and slump requirements shall conform to Paragraphs 2.01D.2 and 2.07B herein for water and Paragraph 2.08A herein for slump.

J. Cement and admixtures shall conform to Paragraph 2.01D herein.

3.05 Order of Placing Concrete

The order of placing concrete in all parts of the work shall be acceptable to the Engineer. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall have cured before the contiguous unit or units are placed, as follows:

A. Foundations

Foundation forms shall remain in place for a minimum of 48 hours after the end of a placement. Thereafter, forms may be removed and construction of adjacent formwork or wall formwork may commence. Concrete for foundation sections shall not be placed until a minimum of 7 days have elapsed from the end of the adjacent placement. Concrete for walls above foundations may be placed after a minimum of 72 hours have elapsed, provided the footings have attained at least 50% of their design strength as demonstrated by testing of concrete cylinders.

B. Walls

Concrete for walls may be placed on top of foundations as described in Paragraph 3.05A herein. Concrete for subsequent wall placements located vertically above new walls may be placed after a minimum of 72 hours have elapsed, provided the walls have attained at least 50% of their design strength as demonstrated by testing of concrete cylinders. Concrete for wall sections shall not be placed until a minimum of 7 days have elapsed from the end of the adjacent placement.

C. Roof Slabs, Decks, and Walkways

Concrete for roof slabs, decks, and walkways may be placed on top of walls after a minimum of 72 hours have elapsed, provided slabs, decks, and walkways are supported by formwork. Concrete for slab, deck, and walkway sections shall not be placed until a minimum of 7 days have elapsed from the end of the adjacent placement.

3.06 Tamping and Vibrating

A. As concrete is placed in the forms or in excavations, Contractor shall insure it is thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement. Vibrators shall be high speed power vibrators (8000 to 10,000 rpm) of an immersion type in sufficient number and with (at least one) standby units as required.

B. Contractor shall take care in placing concrete around waterstops. Contractor shall carefully work concrete by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration, over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.

C. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Vibrators shall be inserted vertically into the concrete and pulled out slowly, penetrating 1/3 of the layer depth of the layer previously placed. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the results herein specified within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

3.07 Finishing Concrete Surfaces

A. General

Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous hard surface. Allowable deviations from plumb or level and from the alignment, profiles, and dimensions shown are defined as tolerances and are specified in Paragraphs 1.04F and 1.04G herein. These tolerances are to be distinguished from irregularities in finish as described herein. Aluminum finishing tools shall not be used.

B. Edges

All exposed edges of columns, beams, walls, roof slabs, elevated walkways, and foundations shall have a 3/4" chamfer, unless noted otherwise.

C. Formed Surfaces

Upon removal of forms, all surfaces shall be cured in accordance with Paragraph 3.09 herein. After the curing period, all surfaces shall be sandblasted to expose air pocket voids and surface defects, and then repaired in accordance with Paragraph 3.12 herein. After repairs are completed, surfaces shall be given an architectural finish in accordance with Paragraph 3.08 herein.

D. Unformed Surfaces

After proper and adequate vibration and tamping, all unformed top surfaces of slabs, floors, walls, and curbs shall be brought to a uniform surface with suitable tools. The classes of finish specified for unformed concrete surfaces are designated and defined as follows:

1. Class "1". After the floated surface (as specified for Class "3") has hardened sufficiently to prevent excess of fine material from being drawn to the surface, steel troweling shall be performed with firm pressure such as will flatten the sandy texture of the floated surface and produce a dense, uniform surface free from blemishes, ripples, and trowel marks. The finish shall be smooth and free of all irregularities.

2. Class "2". Steel trowel finish (as specified for Class "1") without local depressions or high points. In addition, the surface shall be given a light hairbroom finish with brooming perpendicular to drainage unless otherwise shown. The resulting surface shall be rough enough to provide a nonskid finish.

3. Class "3". After sufficient stiffening of the screeded concrete, surfaces shall be float finished with wood or metal floats or with a finishing machine using float blades. Contractor shall not excessively float concrete surfaces while the concrete is plastic or dust concrete surfaces with dry cement and sand to absorb excess moisture. Floating shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture. Surface irregularities shall not exceed 1/4". Joints and edges shall be tooled where shown or as determined by the Engineer.

4. Class "4". Contractor shall provide sufficient leveling and screeding to produce an even, uniform surface with surface irregularities not to exceed 3/8". No further special finish is required.

Contractor shall finish unformed surfaces according to the following schedule unless otherwise shown or specified:

Unformed Surface Finish Schedule

Area	Finish
Grade slabs and foundations to be covered with concrete or fill material	Class "4"
Floors to be covered with grouted tile or topping grout	Class "3"
Slabs which are water bearing with slopes 10 percent and less	Class "1"
Sloping slabs which are water bearing with slopes greater than 10 percent	Class "2"
Slabs not water bearing	Class "2"
Slabs to be covered with built-up roofing	Class "3"
Interior slabs and floors to receive architectural finish/flooring	Class "3"

3.08 Architectural Finish

A. Smooth Sacked Finish

Contractor shall provide architectural finish for exposed to view concrete surfaces. Exposed concrete surfaces include the exterior of structures beginning 1' below grade, the tops of walls, and the interior of water holding structures from the floor to the top of the walls. Architectural finish shall also be provided for

interior exposed to view concrete surfaces. All other incidental exposed to view concrete surfaces shall be provided with an architectural finish such as concrete stairways, concrete containment facilities around chemical storage tanks, elevated walkways, and the like. Architectural finish (i.e., smooth sacked finish) shall also be provided where shown.

B. Immediately after the forms have been stripped, the concrete surface shall be inspected by Engineer and treated and cured in accordance with in Paragraphs 3.09 and 3.12 herein.

C. After the concrete has cured at least 14 days, Contractor shall sandblast the surfaces and repair same in accordance with Paragraph 3.12 herein. Thereafter, the surfaces shall be wetted, and a grout shall be applied with a brush. The grout shall be made by mixing one part portland cement and one part of fine sand that will pass a No. 16 sieve with sufficient water to give it the consistency of thick paint. The cement used in said grout shall be 1/2 gray and 1/2 white portland cement, as determined by the Engineer. White portland cement shall be Atlas white, or equal, furnished by the Contractor. The freshly applied grout shall be vigorously rubbed into the concrete surface with a wood float filling all small air holes. After all the surface grout had been removed with a steel trowel, the surface shall be allowed to dry and, when dry, shall be vigorously rubbed with burlap to remove completely all surface grout so that there is no visible paint-like film of grout on the concrete. The entire cleaning operation for any area shall be completed the day it is started, and grout shall not be left on the surface overnight.

D. Surface Overnight

Cleaning operations for any given day shall be terminated at panel joints. Contractor shall insure that the various operations be carefully timed to secure the desired effect which is a light-colored concrete surface of uniform color and texture without any appearance of a paint or grout film.

E. In the event that improper manipulation results in an inferior finish, Contractor shall rub such inferior areas with carborundum bricks.

F. Before beginning any of the final treatment on exposed surfaces, Contractor shall treat in a satisfactory manner a trial area of at least 200 square feet in some inconspicuous place selected by the Engineer and shall preserve said trial area undisturbed until the completion of the job.

G. All architecturally-treated concrete surfaces shall conform to the accepted sample in texture, color, and quality. It shall be the Contractor's responsibility to maintain and protect the concrete finish.

3.09 Curing and Dampproofing

A. General

All concrete shall be cured for not less than 14 days after placing in accordance with the methods specified herein for the different parts of the work as follows:

Surface to be Cured or Dampproofed	Method
Unstripped forms	1
Wall sections with forms removed	4
Construction joints between footings and walls, and between floor slab and columns	2
Encasement concrete and thrust blocks	3
All concrete surfaces not specifically provided for elsewhere in this Paragraph	4

Surface to be Cured or Dampproofed	Method
Floor slabs on grade in hydraulic structures	5
Roof and slabs not on grade	6

B. Method 1

Wooden forms shall be wetted immediately after concrete has been placed and shall be kept wet with water until removed. If steel forms are used the exposed concrete surfaces shall be kept continuously wet until the forms are removed. If forms are removed within 14 days of placing the concrete, curing shall be continued in accordance with Method 4, Paragraph 3.09E herein.

C. Method 2

The surface shall be covered with burlap mats which shall be kept wet with water for the duration of the curing period, until the concrete in the walls has been placed. No curing compound shall be applied to surfaces cured under Method 2.

D. Method 3

The surface shall be covered with moist earth not less than 4 hours, nor more than 24 hours, after the concrete is placed. Earthwork operations that may damage the concrete shall not begin until at least 7 days after placement of concrete.

E. Method 4

The surface shall be sprayed with a liquid curing compound.

1. Curing compound shall be applied in accordance with the manufacturer's printed instructions at a maximum coverage rate of 175 square feet per gallon and in such a manner as to cover the surface with a uniform film which will seal thoroughly. Two spray coats shall be applied, with the second coat sprayed at right angle direction from first coat.

2. Where the curing compound method is used, care shall be exercised to avoid damage to the seal during the curing period. Should the seal be damaged or broken before the expiration of the curing period, Contractor shall repair break immediately by the application of additional curing compound over the damaged portion.

3. Wherever curing compound may have been applied by mistake to surfaces against which concrete subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by wet sandblasting just prior to the placing of new concrete.

4. Where curing compound is specified, it shall be applied as soon as the concrete has hardened enough to prevent marring on unformed surfaces, and within 2 hours after removal of forms from contact with formed surfaces. Repairs required to be made to formed surfaces shall be made within the said 2-hour period; provided, however, that any such repairs which cannot be made within the said 2-hour period shall be delayed until after the curing compound has been applied. When repairs are to be made to an area on which curing compound has been applied, the area involved shall first be wet-sandblasted to remove the curing compound, following which repairs shall be made as specified herein.

F. Method 5

Immediately after the concrete has been screeded, it shall be treated with a liquid evaporation retardant. The retardant shall be used again after each work operation as necessary to prevent drying shrinkage cracks.

1. Immediately after each square foot of the concrete has been finished, it shall be given a coat of curing compound in accordance with Method 4, Paragraph 3.09E herein. Not less than one hour nor more than 4 hours after the coat of curing compound has been applied, the surface shall be wetted with water delivered through a fog nozzle, and concrete-curing blankets shall be placed on the slabs. The curing blankets shall be polyethylene sheet, polyethylene-coated waterproof paper sheeting or polyethylene-coated burlap. The blankets shall be laid with the edges butted together and with the joints between strips sealed with 2" wide strips of sealing tape or with edges lapped not less than 3" and fastened together with a waterproof cement to form a continuous watertight joint.

2. Curing blankets shall be left in place during the 14 day curing period and shall not be removed until after concrete for adjacent work has been placed. Should the curing blankets become torn or otherwise ineffective, Contractor shall replace damaged sections. During the first 3 days of the curing period, Contractor shall not allow traffic of any nature or depositing, temporary or otherwise, of any materials on the curing blankets. During the remainder of the curing period, foot traffic and temporary depositing of materials that impose light pressure will be permitted only on top of plywood sheets 5/8" minimum thickness, laid over the curing blanket. Contractor shall add water under the curing blanket as often as necessary to maintain damp concrete surfaces at all times.

G. Method 6

Concrete slabs shall be treated with an evaporation retardant as specified in Method 5. The concrete shall be kept continuously wet by the application of water for a minimum period of at least 14 consecutive days beginning immediately after the concrete has been placed or forms removed. Heavy curing mats shall be used as a curing medium to retain the moisture during the curing period. The curing medium shall be weighted or otherwise held in place to prevent being dislodged by wind or any other causes. Until the concrete surface is covered with the curing medium, the entire surface shall be kept damp by applying water using nozzles that atomize the flow so that the surface is not marred or washed. Curing blankets and concrete shall be kept continuously wet by the use of sprinklers or other means both during and after normal working hours. Immediately after the application of water has terminated at the end of the

curing period, the curing medium shall be removed and curing compound immediately applied in accordance with Method 4, Paragraph 3.09E herein. Contractor shall dispose of excess water from the curing operation to avoid damage to the work.

3.10 Protection

Contractor shall protect all concrete against injury until final acceptance by the Owner. Fresh concrete shall be protected from damage due to rain, hail, sleet, or snow. Contractor shall provide such protection while the concrete is still plastic and whenever such precipitation is imminent or occurring. Immediately following the first frost in the fall, Contractor shall be prepared to protect all concrete against freezing. After the first frost, and until the mean daily temperature in the vicinity of the worksite falls below 40°F for more than one day, the concrete shall be maintained at a temperature not lower than 50°F for at least 72 hours after it is placed.

3.11 Curing in Cold Weather

A. Water curing of concrete may be reduced to 6 days during periods when the mean daily temperature in the vicinity of the worksite is less than 40°F; provided that, during the prescribed period of water curing, when temperatures are such that concrete surfaces may freeze, water curing shall be temporarily discontinued.

B. Concrete cured by an application of curing compound will require no additional protection from freezing if the protection at 50°F for 72 hours is obtained by means of approved insulation in contact with the forms or concrete surfaces; otherwise, concrete shall be protected against freezing temperatures for 72 hours immediately following 72 hours protection at 50°F. Concrete cured by water curing shall be protected against freezing temperatures for 3 days immediately following the 72 hours of protection at 50°F.

C. Discontinuance of protection against freezing temperatures shall be such that the drop in temperature of any portion of the concrete will be gradual and will not exceed 40°F in 24 hours. In the spring, when the mean daily temperature rises above 40°F for more than 3 successive days, the specified 72 hour protection at a temperature not lower than 50°F may be discontinued for as long as the mean daily temperature remains above 40°F; provided, that the concrete shall be protected against freezing temperatures for not less than 48 hours after placement.

D. Where artificial heat is employed, Contractor shall take special care to prevent the concrete from drying. Use of unvented heaters will be permitted only when unformed surfaces of concrete adjacent to the heaters are protected for the first 24 hours from an excessive carbon dioxide atmosphere by application of curing compound; provided, that the use of curing compound for such surfaces is otherwise permitted by these specifications.

3.12 Treatment of Surface Defects

A. As soon as forms are removed, all exposed surfaces shall be carefully examined by Engineer and any irregularities shall be immediately rubbed or ground by the Contractor in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Contractor shall not plaster or coat surfaces to be smoothed. Concrete shall then be cured for the specified curing period in accordance with Paragraph 3.09 herein. After the curing period, all surfaces shall be sandblasted to remove curing compound (if utilized), concrete paste film, and laitance, and to expose all air pocket voids and surface defects. Repairs shall not be made until after inspection by the Engineer. Contractor shall not in any case perform extensive patching of honeycombed concrete. Concrete containing minor voids, holes, or similar depression defects with a maximum depth of 1/4" may be filled with the grout used for the architectural finish, or if below grade on the exterior, may be left unfilled. Concrete containing minor voids, holes, honeycombing, or similar depression defects deeper than 1/4" with a maximum depth of 3/4" and/or a maximum surface area of 2 square inches shall be repaired as specified in Section 3.12B. Concrete containing extensive voids, holes, honeycombing, or similar depression defects, shall be repaired utilizing a repair material specifically manufactured for such use (such as Sikatop 121) subject to approval by Engineer, or completely removed and replaced. All repairs and replacements herein specified shall be promptly executed by the Contractor at its own expense.

B. Defective surfaces to be repaired as specified in Paragraph 3.12A herein, shall be cut back from trueline a minimum depth of 1/2" over the entire area. Edges shall not be feathered. Where chipping or cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32" depth of the surface film from all hard portions, by means of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of applying cement mortar so that while the repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The concrete shall then be patched as follows:

A bonding material such as acryl 60 shall be applied to the surface of the area to be repaired just prior to application of the repair mixture. The repair mixture shall consist of one part of Type II, low alkali, portland cement to 3 parts concrete sand. Mix solution shall contain 1/3 bonder, such as acryl 60, to 2/3 water and added in quantities sufficient to allow placement but not cause hairchecking or slippage. Quantities prepared should be limited to that able to be completed within 30 minutes. Areas repaired shall be compacted with a wood ramming device and cured with the water/acryl 60 solution. Repair mixture shall be applied in maximum 1" lifts.

For exposed walls, the cement shall contain such a proportion of Atlas white Portland cement as is required to make the color of the patch match the color of the surrounding concrete.

C. Holes left by tie-rod cones shall be reamed with suitable toothed reamers so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired as described in Paragraph 3.12B herein.

D. All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of Paragraph 3.08 or 3.09 herein, as applicable, using approved methods which will not disturb the bond, cause sagging, or cause horizontal fractures.

3.13 Joint Sealant in Hydraulic Structures

Joint sealant shall be placed in all horizontal and vertical joints of all cast-in-place walls exposed to water. Provide 1" wide x 1/2" deep formed groove for joint sealant. Sealant strip material and installation procedure shall be per Paragraph 2.05 herein.

3.14 Installation of Epoxy Rebar Dowels and Anchor Bolts

Epoxy rebar dowels and anchor bolts shall be bonded with the Hilti Hit-RE 500-SD System, or equal. Unless noted otherwise, rebar dowels shall be ASTM A615 Grade 60 steel and anchor bolts shall be 316 stainless steel threaded rod. Rebar dowels and anchor bolts shall be installed to the depths shown on the Drawings or equipment manufacturer's shop drawings. Prior to injecting epoxy, each drilled hole shall be cleaned out with a nylon brush. Contractor shall install dowels and anchor bolts in strict accordance with the manufacturer's printed instructions.

3.15 Backfilling Against Concrete Structures

All curing shall be in accordance with Paragraph 3.09 herein.

A. Foundations

Minimum time to begin backfilling against foundations is 72 hours from completion of placement.

B. Walls

For non-hydraulic structures, backfilling may commence after 7 days and 75% of design strength have been reached, as demonstrated by testing of field cured concrete cylinders. Backfill height shall not exceed one half of wall height until wall has attained 100% of design strength. Hydraulic structures shall not be backfilled until after hydrostatic leak testing has been completed and accepted.

C. Shear Rings and Thrust Blocks

Shear rings and thrust blocks shall be cured 24 hours minimum prior to backfilling. No pipeline pressure testing shall be performed until 7 days after the last concrete placement.

3.16 Testing of Hydraulic Structures

A. General

Contractor shall water test all concrete tanks, hydraulic channels, sumps, basins, and other structures designed to contain water prior to backfilling. Testing shall be accomplished by filling the structure with water. Testing shall not be performed until roof is in place (if applicable) and all concrete has attained full design strength. Contractor shall provide the following:

1. All pumps, power, piping, and any other equipment required to fill tanks for testing.

2. Necessary provisions to dispose of test water after testing, including pumping if necessary. At completion of tests all temporary piping and connections shall be removed. Waste water shall be disposed of without creating a nuisance or damage to adjacent property.

B. Test Procedure

The structure shall be full to high water level at beginning of test. Contractor may elect to keep the tank full of water for as long as 48 hours prior to the test to allow for water absorption by the concrete. Test period shall be 5 consecutive 24 hour periods totaling 5 consecutive days. Liquid level shall be accurately measured at the beginning and end of test to determine amount of leakage. All visible leaks shall be marked for repair after draining. Permissible leakage from the structure shall not exceed 0.5 gpm per million gallon storage capacity in each 24 hour period over a period of 5 consecutive days after allowance is made for evaporation. If the leakage exceeds the permissible amount, the structure shall be emptied, leaks shall be repaired (in a manner acceptable to the Engineer), and the test rerun. Even if structure passes water loss test, all visible leakage shall be repaired and the test rerun to demonstrate all visible leakage has been repaired.

C. Leak Repair

All visible leaks shall be repaired from the structure interior utilizing epoxy injection. The hydraulic structure shall be drained, and a surface seal shall be applied to the area where leak commences; thereafter, the crack(s) and voids shall

be injected with epoxy in accordance with the manufacturer's recommendations. After injection process is completed, the structure shall be refilled and checked for visible leakage. If structure continues to leak, this process shall be repeated until no visible leaks are present.

3.17 Care and Repair of Concrete

Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance of the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, fails to conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

END OF SECTION

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BEAUMONT-CHERRY VALLEY WATER DISTRICT

NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING

APPENDIX A

CONSTRUCTION PLANS

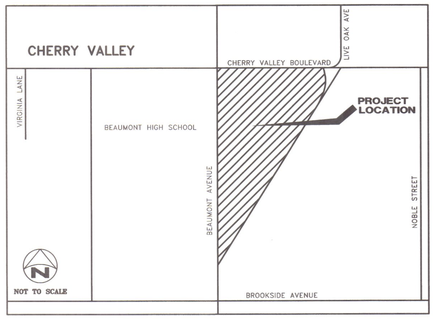
BEAUMONT-CHERRY VALLEY WATER DISTRICT

FENCING PLAN

FOR

NOBLE CREEK RECHARGE FACILITY PHASE I

LOCATED WITHIN A PORTION OF SECTION 27, TOWNSHIP 2 SOUTH, RANGE 1 WEST, S.B.M.

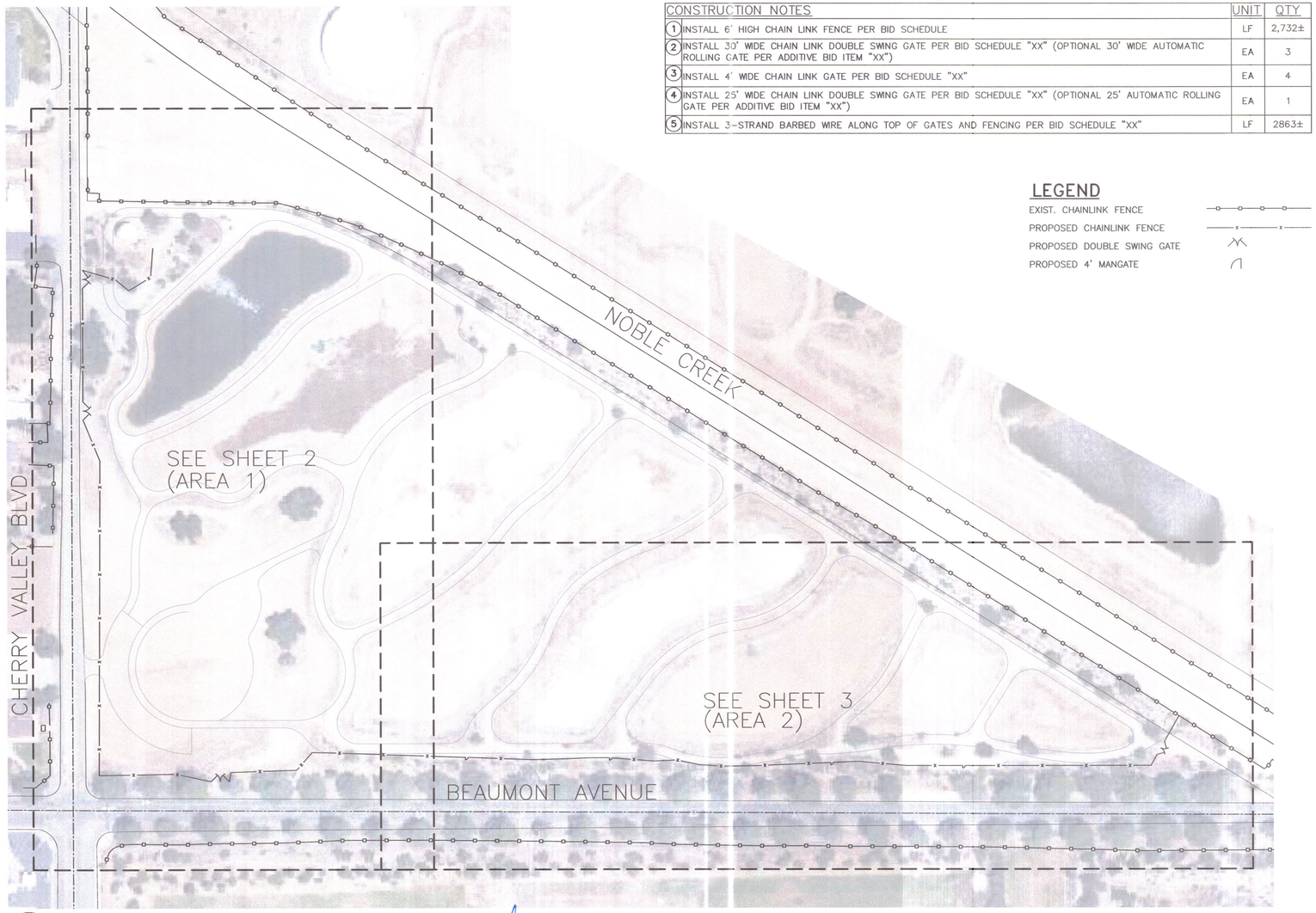


LOCATION MAP

VICINITY MAP

SHEET No.	DESCRIPTION
1	TITLE, VICINITY MAP, SHEET INDEX, LEGEND, CONSTRUCTION NOTES
2	AREA 1 FENCING PLAN
3	AREA 2 FENCING PLAN

SHEET INDEX



SCALE: 1"=100'

CONSTRUCTION NOTES	UNIT	QTY
(1) INSTALL 6' HIGH CHAIN LINK FENCE PER BID SCHEDULE	LF	2,732±
(2) INSTALL 30' WIDE CHAIN LINK DOUBLE SWING GATE PER BID SCHEDULE "XX" (OPTIONAL 30' WIDE AUTOMATIC ROLLING GATE PER ADDITIVE BID ITEM "XX")	EA	3
(3) INSTALL 4' WIDE CHAIN LINK GATE PER BID SCHEDULE "XX"	EA	4
(4) INSTALL 25' WIDE CHAIN LINK DOUBLE SWING GATE PER BID SCHEDULE "XX" (OPTIONAL 25' AUTOMATIC ROLLING GATE PER ADDITIVE BID ITEM "XX")	EA	1
(5) INSTALL 3-STRAND BARBED WIRE ALONG TOP OF GATES AND FENCING PER BID SCHEDULE "XX"	LF	2863±

LEGEND

EXIST. CHAINLINK FENCE

PROPOSED CHAINLINK FENCE

PROPOSED DOUBLE SWING GATE

PROPOSED 4' MANGATE

FOR BIDDING PURPOSES ONLY

48 hours BEFORE excavation
1-(800)227-2600
CALL Underground Service Alert

BEAUMONT-CHERRY VALLEY WATER DISTRICT

ENGINEERING

SYM	REVISIONS	DATE	BY

REGISTERED PROFESSIONAL ENGINEER MARK BRYAN SWANSON No. 72332 CIVIL STATE OF CALIFORNIA

BEAUMONT-CHERRY VALLEY WATER DISTRICT

560 Magnolia Ave. • Beaumont, CA. 92223 • 951-845-9581

APPROVED BY _____

REGISTERED ENGINEER No. 72332 DATE 02-13-2020

SCALE	AS NOTED
FIELD BOOK	N/A
DESIGN	DAB
DRAWN	DAB
CHECKED	MBS/DKJ

BCVWD

NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING PLAN

TITLE, VICINITY MAP, SHEET INDEX, LEGEND, CONSTRUCTION NOTES

SHEET 1 OF 3 SHEETS

FILE No. ---

CHERRY VALLEY
BLVD ALIGNMENT

EX. ASPHALT BERM

33'±

19'±

14'±

EX. ASPHALT BERM

10+00 11+00 12+00 13+00 14+00 15+00 15+91 16+21 17+00 18+00 18+08 18+38 19+00 20+00 20+12

BEAUMONT AVE.
ALIGNMENT

EX. CHAIN LINK FENCE

11+00

11+85

12+15

13+00

14+00

15+00

15+42

EX. ASPHALT BERM

EX. ASPHALT BERM

30'± 20'±

BEAUMONT AVENUE

EX. CHAIN LINK FENCE

MATCHLINE
SEE SHEET 3

NOTES:

1. DIMENSIONS SHOWN ON PLANS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY AND QUOTE FENCING MATERIALS BASED UPON ACTUAL FIELD MEASRUEMENTS.

N

40' 0 40' 80' 120'

SCALE: 1"=40'

CONSTRUCTION NOTES

(1)	INSTALL 6' HIGH CHAINLINK FENCE PER BID SCHEDULE
(2)	INSTALL 30' WIDE CHAINLINK DOUBLE SWING GATE PER BID SCHEDULE "XX" (OPTIONAL 30' WIDE AUTOMATIC ROLLING GATE PER ADDITIVE BID ITEM "XX")

FOR BIDDING PURPOSES ONLY

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CALL Underground Service Alert

BEAUMONT-CHERRY VALLEY WATER DISTRICT

ENGINEERING

SYM	REVISIONS	DATE	BY

REGISTERED PROFESSIONAL ENGINEER
MARK BRYAN SWANSON
No. 72332
CIVIL
STATE OF CALIFORNIA

BEAUMONT-CHERRY VALLEY WATER DISTRICT

560 Magnolia Ave. • Beaumont, CA. 92223 • 951-845-9581

APPROVED BY _____
REGISTERED ENGINEER No. 72332 DATE 02-13-2020

SCALE	AS NOTED
FIELD BOOK	N/A
DESIGN	DAB
DRAWN	DAB
CHECKED	MBS/DKJ

BCVWD

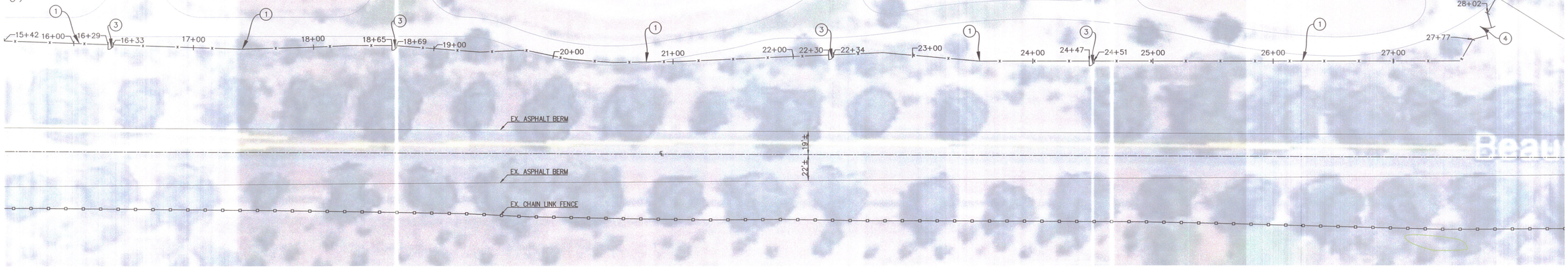
NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING PLAN

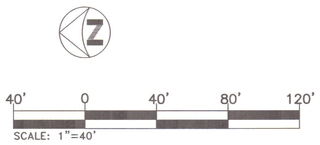
AREA 1 FENCING PLAN

SHEET 2 OF 3 SHEETS

FILE No.

MATCHLINE
SEE SHEET 2





CONSTRUCTION NOTES	
1	INSTALL 6' HIGH CHAIN LINK FENCE PER BID SCHEDULE
3	INSTALL 4' WIDE CHAIN LINK GATE PER BID SCHEDULE "XX"
4	INSTALL 25' WIDE CHAIN LINK DOUBLE SWING GATE PER BID SCHEDULE "XX" (OPTIONAL 25' WIDE AUTOMATIC ROLLING GATE PER ADDITIVE BID ITEM "XX")

NOTES:

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BEAUMONT-CHERRY VALLEY WATER DISTRICT
ENGINEERING

SYM	REVISIONS	DATE	BY

REGISTERED PROFESSIONAL ENGINEER MARK BRYAN NEMMERS No. 72332 CIVIL STATE OF CALIFORNIA

BEAUMONT-CHERRY VALLEY WATER DISTRICT
560 Magnolia Ave. • Beaumont, CA. 92223 • 951-845-9581

APPROVED BY
REGISTERED ENGINEER No. 72332 DATE 02-13-2020

SCALE	AS NOTED
FIELD BOOK	N/A
DESIGN	DAB
DRAWN	DAB
CHECKED	MBS/DKJ

BCVWD
NOBLE CREEK RECHARGE FACILITY
PHASE I FENCING PLAN
AREA 2 FENCING PLAN

SHEET 3 OF 3 SHEETS
FILE No. ---