

## **REQUEST FOR PROPOSAL (RFP)**

for

### **Sobrante Water Treatment Plant Standby Generator Diesel Tank Installation**

Request For Proposal (RFP) No. 734-24-01

#### **ADDENDA**

Prospective bidders are responsible for reviewing any published addenda regarding this bid at [ebmud.com/business-center](http://ebmud.com/business-center)

#### **CONTACT**

**Christian Narvaez**, Associate Mechanical Engineer  
(510) 287-1015  
[christian.narvaez@ebmud.com](mailto:christian.narvaez@ebmud.com)

#### **RESPONSE DUE**

May 1, 2024  
12:00 p.m. PST

#### **SUBMIT ELECTRONICALLY TO\***

**Christian Narvaez**, EBMUD  
[christian.narvaez@ebmud.com](mailto:christian.narvaez@ebmud.com)

*\*Hardcopy proposals will not be accepted*

# **EAST BAY MUNICIPAL UTILITY DISTRICT**

RFP for

## **Sobrante Water Treatment Plant Standby Generator**

### **Diesel Tank Installation**

#### **RFP No. 734-24-01**

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**I. STATEMENT OF WORK**

**A. SCOPE**

It is the intent of these specifications, terms, and conditions to describe the general services needed for the demolition of an existing diesel fuel system, installation of a new diesel tank and the construction/commissioning of a new diesel fuel system that serves the standby diesel generator at the Sobrante Water Treatment Plant.

East Bay Municipal Utility District (District) intends to award a contract (to the Proposer(s) who best meets the District's requirements.

**B. PROPOSER QUALIFICATIONS**

**1. Proposer Minimum Qualifications**

- a. Proposer, Proposer's principal, or Proposer's staff shall have been regularly engaged in the business of providing demolition, installation and commissioning services of diesel fuel tanks and diesel fuel tank systems for at least three (3) years.
- b. Proposer or sub-contractors shall be a certified or authorized general contractor having an "A" license, have an International Codes Council (ICC) certification, shall be a Veeder-Root Certified Technician and have a Hazardous Substance Removal Certification (HAZ) per California State Licensing Board Business and Professions Code, Division 3, Chapter 9. Contractors, Article 4. Classifications Section 7058.7.
- c. Proposer shall possess all permits, licenses, and professional credentials necessary to perform services as specified under this RFP.

**C. SPECIFIC REQUIREMENTS**

1. The proposer shall demolish existing diesel fuel system in accordance with page E-1 of Exhibit E, Project Drawings, that consists of:
  - a) One 2,000 gallon diesel aboveground fuel storage tank.
  - b) Existing tank monitor systems, wiring and conduit.
  - c) One 50 gallon Day-Tank with associated electrical and piping.
2. The proposer shall abandon existing 1,000 gallon diesel underground fuel storage tank in place. The underground tank will need to be made inert through options including, but not limited to, evacuating the contents of the

tank through local county-approved hazardous waste disposal methods, filling with sand, etc.

3. The proposer shall install new diesel fuel system.

The new diesel fuel system that needs to be installed includes:

- a) One, 2,000 gallon aboveground diesel fuel storage tank.
- b) One 50 gallon Day-Tank.
- c) All associated piping, wiring and spill protection.
- d) Tank and piping monitoring system.

4. The manufacturer of the new diesel fuel tank system shall design the day tank control system and commission the entirety of the fuel system while coordinating with District Staff.

5. The proposer shall coordinate fire, building, and health department inspections with Contra Costa County once the diesel fuel system is installed.

6. The proposer shall supply all necessary information to District to complete the following permits that have been initiated by the District:

- a. Contra Costa County Environmental Health existing AST Removal /Closure In Place.
- b. Contra Costa County Fire Protection District new AST Construction / AST Removal.
- c. County of Contra Costa Building Department – Building and Electrical Permit.

#### D. DELIVERABLES / REPORTS

1. Weekly construction reports detailing major demolition or construction activities.
2. Results of fire, building, and health department inspections.
3. Commissioning reports of the day tank operating system.
4. Final documentation of decommissioning of the underground diesel storage tank.
5. As-built drawings.

**II. CALENDAR OF EVENTS**

EVENT	DATE/LOCATION	
RFP Issued	April 2, 2024	
MANDATORY Site Walk	April 16, 2024@ 10 AM	at: Sobrante Water Treatment Plant 5500 Amend Rd. El Sobrante, CA 94803
Addendum to Announce Pre-Approved Equivalents (if necessary)	April 23, 2024	
Response Due	May 1, 2024, by 4:00 p.m.	
Anticipated Contract Start Date	June 3, 2024	

**Note:** All dates are subject to change by District.

Proposers are responsible for reviewing <https://www.ebmud.com/business-center/requests-proposal-rfps/> for any published addenda. Hard copies of addenda will not be mailed out.

**A. MANDATORY SITE WALK/ PROPOSAL CONFERENCE**

Mandatory site walk will be held to:

1. Allow the District to discuss the scope of the project.
2. Provide Proposers an opportunity to view a site, receive documents, etc. necessary to respond to this RFP.
3. Provide an opportunity for Proposers to ask specific questions about the project and request RFP clarifications.
4. Provide the District with an opportunity to receive feedback regarding the project and RFP.

All questions deemed to be pertinent by the District will be addressed in Addenda following the site walk/Proposal conference.

**\*\*\*In order to be eligible to Proposal on this RFP**, a representative from the Proposer’s company **MUST** attend site walk/Proposal conference and sign into confirm her/his

attendance. If an RFP response is submitted by a company that was not in attendance at this meeting, its RFP response WILL be rejected\*\*\*

### **III. DISTRICT PROCEDURES, TERMS, AND CONDITIONS**

#### **A. RFP ACCEPTANCE AND AWARD**

1. RFP responses will be evaluated by the Selection Committee and will be scored and ranked in accordance with the RFP section entitled "Evaluation Criteria/Selection Committee."
2. The Selection Committee will recommend award to the Proposer who, in its opinion, has submitted the RFP response that best serves the overall interests of the District. Award may not necessarily be made to the Proposer with the lowest overall cost.
3. The District reserves the right to award to a single or to multiple General or Professional Service Providers, dependent upon what is in the best interest of the District.
4. The District has the right to decline to award this contract or any part of it for any reason.
5. Any specifications, terms, or conditions issued by the District, or those included in the Proposer's submission, in relation to this RFP, may be incorporated into any purchase order or contract that may be awarded as a result of this RFP.
6. Award of contract. The District reserves the right to reject any or all proposals, to accept one part of a proposal and reject the other, unless the proposer stipulates to the contrary, and to waive minor technical defects and administrative errors, as the interest of the District may require. Award will be made, or proposals rejected by the District as soon as possible after proposals have been opened.

#### **B. EVALUATION CRITERIA/SELECTION COMMITTEE**

All proposals will be evaluated by a Selection Committee. The Selection Committee may be composed of District staff and other parties that have expertise or experience in this type of procurement. The Selection Committee will select a Proposer in accordance with the evaluation criteria set forth in this RFP. The evaluation of the RFP responses shall be within the sole judgment and discretion of the Selection Committee.

The Selection Committee will evaluate each RFP response meeting the qualification requirements set forth in this RFP. Proposer should bear in mind that any RFP response that is unrealistic in terms of the technical or schedule commitments, or unrealistically high or low in cost, will be deemed reflective of an inherent lack of technical

competence or indicative of a failure to comprehend the complexity and risk of the District’s requirements as set forth in this RFP.

RFP responses will be evaluated and scored according to the Evaluation Criteria below and scored according to a zero to five-point scale. The scores for all Evaluation Criteria will then be added to arrive at a weighted score for each RFP response. An RFP response with a high weighted total will be ranked higher than one with a lesser-weighted total.

The Evaluation Criteria are as follows:

	<b>Evaluation Criteria</b>
<b>A.</b>	<p><b>Cost:</b>                      The points for Cost will be computed by dividing the amount of the lowest responsive RFP response received by each Proposer’s total proposed cost.</p> <p>While not reflected in the Cost evaluation points, an evaluation may also be made of:</p> <ol style="list-style-type: none"> <li>1. Reasonableness (i.e., does the proposed pricing accurately reflect the Proposer’s effort to meet requirements and objectives?)</li> <li>2. Realism (i.e., is the proposed cost appropriate to the nature of the products and services to be provided?); and</li> <li>3. Affordability (i.e., the ability of the District to finance this project).</li> </ol> <p>1. Consideration of price in terms of overall affordability may be controlling in circumstances where two or more RFP responses are otherwise judged to be equal, or when a superior RFP response is at a price that the District cannot afford.</p>
<b>B.</b>	<p><b>Implementation Plan and Schedule:</b>                      An evaluation will be made of the likelihood that the Proposer’s implementation plan and schedule will meet the District’s schedule. Additional credit will be given for the identification and planning for mitigation of schedule risks which the Proposer believes may adversely affect any portion of the District’s schedule.</p>
<b>C.</b>	<p><b>Relevant Experience:</b>                      RFP responses will be evaluated against the RFP specifications and the questions below:</p> <ol style="list-style-type: none"> <li>1. Do the individuals assigned to the project have experience on similar projects?</li> <li>2. Are résumés complete and do they demonstrate backgrounds that would be desirable for individuals engaged in the work the project requires?</li> </ol>

	How extensive is the applicable education and experience of the personnel designated to work on the project?
<b>D.</b>	<p><b>References (See Exhibit A – RFP Response Packet):</b></p> <ol style="list-style-type: none"> <li>1. If a short list process is used for a solicitation, references are only performed on the shortlisted Proposers and the score for reference checks is not included in the preliminary short list score.</li> </ol>
<b>E.</b>	<p><b>Understanding of the Project:</b></p> <p>RFP responses will be evaluated against the RFP specifications and the questions below:</p> <ol style="list-style-type: none"> <li>1. Has the Proposer demonstrated a thorough understanding of the purpose and scope of the project?</li> <li>2. How well has the Proposer identified pertinent issues and potential problems related to the project?</li> <li>3. Has the Proposer demonstrated that it understands the deliverables the District expects it to provide?</li> <li>4. Has the Proposer demonstrated that it understands the District’s time schedule and can meet it?</li> </ol>
<b>F.</b>	<p><b>Methodology:</b></p> <p>RFP responses will be evaluated against the RFP specifications and the questions below:</p> <ol style="list-style-type: none"> <li>1. Does the methodology depict a logical approach to fulfilling the requirements of the RFP?</li> <li>2. Does the methodology match and contribute to achieving the objectives set out in the RFP?</li> <li>3. Does the methodology interface with the District’s time schedule?</li> </ol>
<b>G.</b>	<p><b>Contract Equity Program:</b></p> <p>Proposer shall be eligible for SBE or DVBE preference points if they are a certified small business entity, as described in the guidelines contained in Exhibit A-Contract Equity Program, <u>and</u> they check the appropriate box, requesting preference, in Exhibit A-Proposer Information and Acceptance. Qualified DVBEs and/or SBEs will receive an additional 5 points to their total score.</p>

c. PRICING

1. Prices quoted shall be firm for the first 6 months of any contract that may be awarded pursuant to this RFP.
2. All prices quoted shall be in United States dollars.
3. Price quotes shall include any and all payment incentives available to the District.



4. Proposers are advised that in the evaluation of cost, if applicable, it will be assumed that the unit price quoted is correct in the case of a discrepancy between the unit price and extended price.
5. Prevailing Wages:

All Contractors proposing on a public works project and all Subcontractors of any tier shall be registered with the State Department of Industrial Relations pursuant to Section 1725.5 of the Labor Code.

The Contractor shall post a copy of the general prevailing rate of per diem wages at the jobsite pursuant to Section 1773.2 of the Labor Code of the State of California.

Pursuant to the provisions of Division 2, Part 7, Chapter 1, Article 2, and any amendments thereof of the Labor Code of the State of California, the Contractor and any Subcontractor shall pay not less than the specified prevailing rate of wages to all workers employed in the execution of the contract.

The Contractor shall, as a penalty to the State or the District, forfeit Twenty-Five (\$25.00) Dollars for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing rates for any work or craft in which such worker is employed under the contract by the Contractor or by any Subcontractor. The difference between such stipulated prevailing wage rates and the amount paid to such worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor. The Contractor shall comply with the provisions of Section 1776 of the Labor Code of the State of California. For all classes of work not specified herein, the minimum wage shall be that specified for general laborer.

The specified wage rates are minimum rates only and the District will not consider and shall not be liable for any claims for additional compensation made by the Contractor because of payment by Contractor of any wage rate in excess of the general prevailing rates. All disputes in regard to the payment of wages in excess of those specified herein shall be adjusted by the Contractor at his own expense.

The holidays upon which such rates shall be paid shall be all holidays recognized in the collective bargaining agreement applicable to the particular craft, classification, or type of worker employed on the project.

D. NOTICE OF INTENT TO AWARD AND PROTESTS

At the conclusion of the RFP response evaluation process, all entities who submitted a proposal package will be notified in writing by e-mail or USPS mail with the name of the Proposer being recommended for contract award. The document providing this notification is the Notice of Intent to Award.

Negotiations for a Consulting Services Agreement with a “not to exceed” contract price (for time and expenses) will be scheduled shortly after the Notice of Intent to Award. If an Agreement cannot be achieved, the District will proceed to negotiate with the next highest ranked Proposer.

Protests must be in writing and must be received no later than seven (7) workdays after the District issues the Notice of Intent to Award. The District will reject the protest as untimely if it is received after this specified time frame. Protests will be accepted from proposers or potential proposers only.

If the protest is mailed and not received by the District, the protesting party bears the burden of proof to submit evidence (e.g., certified mail receipt) that the protest was sent in a timely manner so that it would be received by the District within the RFP protest period.

Proposal protests must contain a detailed and complete written statement describing the reason(s) for protest. The protest must include the name and/or number of the proposal, the name of the firm protesting, and include a name, telephone number, email address and physical address of the protester. If a firm is representing the protester, they shall include their contact information in addition to that of the protesting firm.

Protests must be mailed, hand delivered, or emailed to the Manager of Purchasing, Mailstop 102, East Bay Municipal Utility District, 375 Eleventh Street, Oakland, CA 94607 or P.O. Box 24055, Oakland, California 94623. Facsimile and electronic mail protests must be followed by a mailed or hand delivered identical copy of the protest and must arrive within the seven workday time limit. Any proposal protest filed with any other District office shall be forwarded immediately to the Manager of Purchasing.

In the event that the protest is denied, the protester can appeal the determination to the requesting organization’s Department Director. The appeal must be submitted to the Department Director no later than five workdays from the date which the protest determination was transmitted by the District, to the protesting party. The appeal shall focus on the points raised in the original protest, and no new points shall be raised in the appeal.

Such an appeal must be made in writing and must include all grounds for the appeal and copies of the original protest and the District’s response. The proposal protester must

also send the Purchasing Division a copy of all materials sent to the Department Director.

The Department Director will make a determination of the appeal and respond to the protester by certified mail in a timely manner. If the appeal is denied, the letter will include the date, time, and location of the Board of Directors meeting at which staff will make a recommendation for award and inform the protester it may request to address the Board of Directors at that meeting.

The District may transmit copies of the protest and any attached documentation to all other parties who may be affected by the outcome of the protest. The decision of the District as to the validity of any protest is final. This District's final decision will be transmitted to all affected parties in a timely manner.

E. WARRANTY

1. Proposer expressly warrants that all goods and services to be furnished pursuant to any contract awarded arising from the Proposal will conform to the descriptions and specifications contained herein and in supplier catalogs, product brochures, and other representations, depictions, or models, and will be free from defects, of merchantable quality, good material, and workmanship. Proposer expressly warrants that all goods and services to be furnished pursuant to such award will be fit and sufficient for the purpose(s) intended. This warranty shall survive any inspections, delivery, acceptance, payment, or contract termination for any reason, by the District. Proposer warrants that all work and services furnished hereunder shall be guaranteed for a period of 1 year from the date of acceptance by the District.

F. INVOICING

1. Following the District's acceptance of product(s) meeting all specified requirements, and/or the complete and satisfactory performance of services, the District will render payment within thirty (30) days of receipt of a correct invoice.
2. The District will notify the General or Professional Service Provider of any invoice adjustments required.
3. Invoices shall contain, at a minimum, District purchase order number, invoice number, remit to address, and itemized services description.

4. The District will pay General or Professional Service Provider in an amount not to exceed the negotiated amount(s) which will be referenced in the agreement signed by both parties.

G. LIQUIDATED DAMAGES

1. A deduction for liquidated damages of \$ 1000 per week will be assessed for not meeting proposer submitted schedule construction completion date.
2. It being impracticable or extremely difficult to fix the actual damage, the amount set forth above is hereby agreed upon as liquidated damages and will be deducted from any money due under the agreement arising from this RFP.
3. In the event performance and/or deliverables have been deemed unsatisfactory, the District reserves the right to withhold future payments until the performance and/or deliverables are deemed satisfactory.

H. BONDS

1. The successful Proposer will be required to post and maintain a Payment Bond for 2 percent (2%) of the total contract amount with the District. Bonds must be on District forms attached to this RFP as **Exhibit D - Bond Forms**.

**IV. RFP RESPONSE SUBMITTAL INSTRUCTIONS AND INFORMATION**

A. DISTRICT CONTACTS

All contact during the competitive process is to be through the contact listed on the first page of this RFP. The following persons are to be contacted only for the purposes specified below:

FOR INFORMATION REGARDING TECHNICAL SPECIFICATIONS:

Attn: Christian Narvaez, Associate Mechanical Engineer

EBMUD-Plant Engineering Services

E-Mail: [Christian.Narvaez@ebmud.com](mailto:Christian.Narvaez@ebmud.com)

PHONE: (510) 287-1015

FOR INFORMATION ON THE CONTRACT EQUITY PROGRAM:

Attn: Contract Equity Office

PHONE: (510) 287-0114

AFTER AWARD:

Attn: Christian Narvaez, Associate Mechanical Engineer  
EBMUD- Plant Engineering Services  
E-Mail: Christian.Narvaez@ebmud.com  
PHONE: (510) 287-1015

B. SUBMITTAL OF RFP RESPONSE

1. At this time, no hardcopy proposals will be accepted. Upload your RFP response in pdf format and prior to the bid due date/time RFP submittals, in their entirety, shall be emailed to Christian.Narvaez@ebmud.com. The District's email has limitations on attachment size. Make sure your response is less than 25 megabytes. If the file exceeds the limit, you will need to send multiple emails. Proposers are solely responsible for ensuring timely delivery of the proposals. The District shall not be responsible for any issues related to transfer of files through email. You may call at (510)-287-1015 to check receipt of the proposal.
2. All costs required for the preparation and submission of an RFP response shall be borne by the Proposer.
3. California Government Code Section 4552: In submitting an RFP response to a public purchasing body, the Proposer offers and agrees that if the RFP response is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2, commencing with Section 16700, of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the Proposer for sale to the purchasing body pursuant to the RFP response. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the Proposer.
4. Proposer expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act.
5. The RFP response shall remain open to acceptance and is irrevocable for a period of one hundred eighty (180) days, unless otherwise specified in the RFP documents.
6. It is understood that the District reserves the right to reject any or all RFP responses.

c. RESPONSE FORMAT

1. **Proposers shall not modify the existing text for any part of Exhibits A, B, C, D, E, or F or qualify their RFP responses. Proposers shall not submit to the District a re-typed or otherwise re-created version of these documents or any other District-provided document.**
2. RFP responses, in whole or in part, are NOT to be marked confidential or proprietary. The District may refuse to consider any RFP response or part thereof so marked. RFP responses submitted in response to this RFP may be subject to public disclosure. The District shall not be liable in any way for disclosure of any such records.



# EXHIBIT A RFP RESPONSE PACKET

RFP For –

## Sobrante Water Treatment Plant Standby Generator Diesel Tank Installation & No.

To: The EAST BAY MUNICIPAL UTILITY District (“District”)

From: \_\_\_\_\_  
(Official Name of Proposer)

### RFP RESPONSE PACKET GUIDELINES

- **SUBMITTAL SHALL CONTAIN THE FOLLOWING:**
  - EXHIBIT A – RFP RESPONSE PACKET**INCLUDING ALL REQUIRED DOCUMENTATION AS DESCRIBED IN “EXHIBIT A- REQUIRED DOCUMENTATION AND SUBMITTALS”**
  
- **PROPOSERS THAT DO NOT COMPLY WITH THE REQUIREMENTS, AND/OR SUBMIT AN INCOMPLETE RFP RESPONSE MAY BE SUBJECT TO DISQUALIFICATION AND THEIR RFP RESPONSE REJECTED IN WHOLE.**
  
- **IF PROPOSERS ARE MAKING ANY CLARIFICATIONS AND/OR AMENDMENTS, OR TAKING EXCEPTION TO ANY PART OF THIS RFP, THESE MUST BE SUBMITTED IN THE EXCEPTIONS, CLARIFICATIONS, AND AMENDMENTS SECTION OF THIS EXHIBIT A – RFP RESPONSE PACKET. THE DISTRICT, AT ITS SOLE DISCRETION, MAY ACCEPT AMENDMENTS/EXCEPTIONS, OR MAY DEEM THEM TO BE UNACCEPTABLE, THEREBY RENDERING THE RFP RESPONSE DISQUALIFIED.**
  
- **PROPOSORS SHALL NOT MODIFY DISTRICT LANGUAGE IN ANY PART OF THIS RFP OR ITS EXHIBITS, NOR SHALL THEY QUALIFY THEIR RFP RESPONSE BY INSERTING THEIR OWN LANGUAGE OR FALSE CLAIMS IN THEIR RESPONSE. ANY EXCEPTIONS AND CLARIFICATIONS MUST BE PLACED IN THE “EXCEPTIONS/ CLARIFICATIONS” PAGE, NOT BURIED IN THE PROPOSAL ITSELF.**



### PROPOSER INFORMATION AND ACCEPTANCE

1. The undersigned declares that all RFP documents, including, without limitation, the RFP, Addenda, and Exhibits, have been read and that the terms, conditions, certifications, and requirements are agreed to.
2. The undersigned is authorized to offer, and agrees to furnish, the articles and services specified in accordance with the RFP documents.
3. The undersigned acknowledges acceptance of all addenda related to this RFP. List Addenda for this RFP on the line below:

Addendum #	Date

4. The undersigned hereby certifies to the District that all representations, certifications, and statements made by the Proposer, as set forth in this RFP Response Packet and attachments, are true and correct and are made under penalty of perjury pursuant to the laws of California.
5. The undersigned acknowledges that the Proposer is, and will be, in good standing in the State of California, with all the necessary licenses, permits, certifications, approvals, and authorizations necessary to perform all obligations in connection with this RFP and associated RFP documents.
6. It is the responsibility of each Proposer to be familiar with all of the specifications, terms, and conditions and, if applicable, the site condition. By the submission of an RFP response, the Proposer certifies that if awarded a contract it will make no claim against the District based upon ignorance of conditions or misunderstanding of the specifications.
7. Patent indemnity: General or Professional Service Providers who do business with the District shall hold the District, its Directors, officers, agents, and employees harmless from liability of any nature or kind, including cost and expenses, for infringement or use of any patent, copyright or other proprietary right, secret process, patented or unpatented invention, article, or appliance furnished or used in connection with the contract or purchase order.
8. Insurance certificates are not required at the time of submission. However, by signing Exhibit A – RFP Response Packet, the Proposer agrees to meet the minimum insurance requirements stated in the RFP. This documentation must be provided to the District prior to execution of an agreement by the District and shall include an insurance certificate which meets the minimum insurance requirements, as stated in the RFP.



9. The undersigned acknowledges that RFP responses, in whole or in part, are NOT to be marked confidential or proprietary. The District may refuse to consider any RFP response or part thereof so marked. RFP responses submitted in response to this RFP may be subject to public disclosure. The District shall not be liable in any way for disclosure of any such records.
10. The undersigned Proposer hereby submits this RFP response and binds itself to the District. The RFP, subsequent Addenda, Proposers Response Packet, and any attachments, shall be used to form the basis of a Contract, which once executed shall take precedence.
11. The undersigned acknowledges **ONE** of the following (please check only one box)\*:
- Proposer is not an SBE nor a DVBE and is ineligible for any Proposal preference; **OR**
- Proposer is an SBE or DVBE as described in the Contract Equity Program (CEP) and Equal Employment Opportunity (EEO) Guidelines, and has completed the CEP and EEO forms at the hyperlink contained in the CEP and EEO section of this Exhibit A.

\*If no box is checked it will be assumed that the Proposer is ineligible for Proposal preference, and none will be given. For additional information on SBE/DVBE Proposal preference please refer to the Contract Equity Program and Equal Employment Opportunity Guidelines at the above referenced hyperlink.

Official Name of Proposer (exactly as it appears on Proposer's corporate seal and invoice): \_\_\_\_\_

Street Address Line 1: \_\_\_\_\_

Street Address Line 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Webpage: \_\_\_\_\_

Type of Entity / Organizational Structure (check one):

- |  |  |
|--|--|
| <input type="checkbox"/> Corporation                   | <input type="checkbox"/> Joint Venture       |
| <input type="checkbox"/> Limited Liability Partnership | <input type="checkbox"/> Partnership         |
| <input type="checkbox"/> Limited Liability Corporation | <input type="checkbox"/> Non-Profit / Church |
| <input type="checkbox"/> Other: _____                  |  |

Jurisdiction of Organization Structure: \_\_\_\_\_

Date of Organization Structure: \_\_\_\_\_

Federal Tax Identification Number: \_\_\_\_\_

Department of Industrial Relations (DIR) Registration Number: \_\_\_\_\_

Primary Contact Information:

Name / Title: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Street Address Line 1: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Does proposer or any employee/representative/service provider have any relatives currently employed with EBMUD? (This does not impact award of a qualified proposal; required reporting purposes only.)

YES  NO

If so, please list :

CONTRACTOR OR CONTRACTOR EMPLOYEE FIRST AND LAST NAME	DISTRICT EMPLOYEE FIRST AND LAST NAME	RELATIONSHIP

**SIGNATURE:** \_\_\_\_\_

Name and Title of Signer (printed): \_\_\_\_\_

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_



## PROPOSAL FORM

Cost shall be submitted on this Proposal Form as is. The prices quoted shall not include Sales Tax or Use Tax; said tax, wherever applicable, will be paid by the District to the General or Professional Service Provider, if licensed to collect, or otherwise directly to the State.

No alterations or changes of any kind to the Proposal Form(s) are permitted. RFP responses that do not comply may be subject to rejection in total. The cost quoted below shall be the cost the District will pay for the term of any contract that is a result of this RFP process.

Quantities listed herein are annual estimates based on past usage and are not to be construed as a commitment. No minimum or maximum is guaranteed or implied.

<b>Description</b>	<b>Unit of Measure</b>	<b>Estimated Quantity</b>	<b>Unit Cost</b>	<b>Extended Cost</b>
Disposal of Existing Aboveground Diesel Tank	each	1	\$	\$
Installation of New Aboveground Diesel Tank	each	1	\$	\$
Installation of New Day Tank	Each	1	\$	\$
<b>TOTAL COST</b>				<b>\$</b>



## REQUIRED DOCUMENTATION AND SUBMITTALS

All of the specific documentation listed below is required to be submitted with the Exhibit A – RFP Response Packet. Proposers shall submit all documentation, in the order listed below, and clearly label each section of the RFP response with the appropriate title (i.e., Table of Contents, Letter of Transmittal, Key Personnel, etc.).

1. **Letter of Transmittal**: RFP response shall include a description of the Proposer’s capabilities and approach in providing its services to the District, and provide a brief synopsis of the highlights of the RFP response and overall benefits to the District. This synopsis should not exceed three (3) pages in length and should be easily understood.
2. **Key Personnel**: RFP response shall include a complete list of all key personnel associated with the RFP. This list must include all key personnel who will provide services to District staff and all key personnel who will provide maintenance and support services. For each person on the list, the following information shall be included:
  - (a) The person’s relationship with the Proposer, including job title and years of employment with the Proposer;
  - (b) The role that the person will play in connection with the RFP;
  - (c) The person’s telephone number, fax number, and e-mail address;
  - (d) The person’s educational background; and
  - (e) The person’s relevant experience, certifications, and/or merits
3. .
4. **Description of the Proposed Services**: RFP response shall include a description of the terms and conditions of services to be provided during the contract term including response times. The description shall contain a basis of estimate for services including its scheduled start and completion dates, the number of Proposer’s and District personnel involved, and the number of hours scheduled for each person.. Finally, the description must: (1) specify how the services in the RFP response will meet or exceed the requirements of the District; (2) explain any special resources or approaches that make the services of the Proposer particularly advantageous to the District; and (3) identify any limitations or restrictions of the Proposer in providing the services that the District should be aware of in evaluating its RFP response to this RFP.
5. **Implementation Plan and Schedule**: The RFP response shall include an implementation plan and schedule. The plan for implementing the proposed equipment/system and services shall include an Acceptance Test Plan. In addition, the plan shall include a detailed schedule indicating how the Proposer will ensure adherence to the timetables for the final equipment/system and/or services.

6. **Sustainability Statement:** Contractors shall submit a statement regarding any sustainable, environmental or socially responsible initiatives or practices that they or their suppliers engage in. This information can be in relation to the specific services or work products solicited via this RFP, or in relation to the manufacture, delivery, or business practices of your firm.

7. **References:**

- (a) Proposers must use the templates in the “References” section of this Exhibit A – RFP Response Packet to provide references.
- (b) References should have similar scope, volume, and requirements to those outlined in these specifications, terms, and conditions.
  - Proposers must verify the contact information for all references provided is current and valid.
  - Proposers are strongly encouraged to notify all references that the District may be contacting them to obtain a reference.
- (c) The District may contact some or all of the references provided in order to determine Proposer’s performance record on work similar to that described in this RFP. The District reserves the right to contact references other than those provided in the RFP response and to use the information gained from them in the evaluation process.

8. **Exceptions, Clarifications, Amendments:**

- (a) The RFP response shall include a separate section calling out all clarifications, exceptions, and amendments, if any, to the RFP and associated RFP documents, which shall be submitted with the proposer’s RFP response using the template in the “Exceptions, Clarifications, Amendments” section of this Exhibit A – RFP Response Packet.
- (b) **THE DISTRICT IS UNDER NO OBLIGATION TO ACCEPT ANY EXCEPTIONS, AND SUCH EXCEPTIONS MAY BE A BASIS FOR RFP RESPONSE DISQUALIFICATION.**

9. **Contract Equity Program:**

- (a) Every proposer must fill out, sign, and submit the appropriate sections of the Contract Equity Program and Equal Employment Opportunity documents located at the hyperlink contained in the last page of this Exhibit A. Special attention should be given to completing Form P-25, "Employment Data and Certification". Any proposer needing assistance in completing these forms should contact the District's Contract Equity Office at (510) 287-0114 prior to submitting an RFP response.



## REFERENCES

### RFP For - Standby Generator Diesel Tank Installation RFP No.

Proposer Name: \_\_\_\_\_

**Proposer must provide a minimum of 3 references.**

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	

Company Name:	Contact Person:
Address:	Telephone Number:
City, State, Zip:	E-mail Address:
Services Provided / Date(s) of Service:	



**EXCEPTIONS, CLARIFICATIONS, AMENDMENTS**

**RFP For - Sobrante Water Treatment Plant Standby Generator Diesel Tank Installation & No.**

**Proposer Name:** \_\_\_\_\_

List below requests for clarifications, exceptions, and amendments, if any, to the RFP and associated RFP documents, and submit with your RFP response.

The District is under no obligation to accept any exceptions and such exceptions may be a basis for RFP response disqualification.

Reference to:			Description
Page No.	Section	Item No.	
p. 23	D	1.c.	<i>Proposer takes exception to...</i>

\*Print additional pages as necessary



## **CONTRACT EQUITY PROGRAM & EQUAL EMPLOYMENT OPPORTUNITY**

The District's Board of Directors adopted the Contract Equity Program (CEP) to enhance equal opportunities for business owners of all races, ethnicities, and genders who are interested in doing business with the District. The program has contracting objectives, serving as the minimum level of expected contract participation for the three availability groups: white-men owned businesses, white-women owned businesses, and ethnic minority owned businesses. The contracting objectives apply to all contracts that are determined to have subcontracting opportunities, and to all General or Professional Service Providers regardless of their race, gender, or ethnicity.

All Contractors and their subcontractors performing work for the District must be Equal Employment Opportunity (EEO) employers and shall be bound by all laws prohibiting discrimination in employment. There shall be no discrimination against any person, or group of persons, on account of race, color, religion, creed, national origin, ancestry, gender including gender identity or expression, age, marital or domestic partnership status, mental disability, physical disability (including HIV and AIDS), medical condition (including genetic characteristics or cancer), genetic information, or sexual orientation.

**Contractor and its subcontractors shall abide by the requirements of 41 CFR §§ 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities and prohibit discrimination against all individuals based on their race, color, religion, sex, sexual orientation, gender identity, or national origin in the performance of this contract. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, national origin, protected veteran status or disability.**

All Contractors shall include the nondiscrimination provisions above in all subcontracts. Please include the required completed forms with your proposal. Non-compliance with the Guidelines may deem a proposal non-responsive, and therefore, ineligible for contract award. Your firm is responsible for:

- 1) Reading and understanding the CEP guidelines.
- 2) Filling out and submitting with your proposal the appropriate forms.

The CEP guidelines and forms can be downloaded from the District website at the following link:  
**<https://www.ebmud.com/business-center/contract-equity-program>**

If you have questions regarding the Contract Equity Program, please call (510) 287-0114.





## EXHIBIT B

# INSURANCE REQUIREMENTS

PROPOSER shall take out and maintain during the life of the Agreement all insurance required and PROPOSER shall not commence work until such insurance has been approved by DISTRICT. The proof of insurance shall be on forms provided by DISTRICT directly following these Insurance Requirements.

PROPOSERS are not required to submit completed insurance verification documents with their bid but will be required to submit them upon notification of award. By signing Exhibit A – RFP Response Packet, the Proposer agrees to meet the minimum insurance requirements stated in the RFP.

The following provisions applicable to all required insurance:

- A. Prior to the beginning of and throughout the duration of Services, and for any additional period of time as specified below, CONTRACTOR shall, at its sole cost and expense, maintain insurance in conformance with the requirements set forth below.
- B. CONTRACTOR shall provide Verification of Insurance as required by this Agreement by providing the completed Verification of Insurance as requested below signing and submitting this Exhibit B to the DISTRICT. The Exhibit B may be signed by an officer of the CONTRACTOR (Agent) or by the Insurance Broker for the CONTRACTOR. CONTRACTOR shall update Exhibit B throughout the specified term of the insurance required by this Agreement by resubmitting the completed Exhibit B prior to the expiration date of any of the required insurance. The updated Exhibit B shall become a part of the Agreement but shall not require a change order to the Agreement. The Notice to Proceed shall not be issued, and CONTRACTOR shall not commence Services until such insurance has been accepted by the DISTRICT.
- C. CONTRACTOR shall carry and maintain the minimum insurance requirements as defined in this Agreement. CONTRACTOR shall require any subcontractor to carry and maintain the minimum insurance required in this Agreement to the extent they apply to the scope of the services to be performed by subcontractor.
- D. Acceptance of verification of Insurance by the DISTRICT shall not relieve CONTRACTOR of any of the insurance requirements, nor decrease liability of CONTRACTOR.
- E. The insurance required hereunder may be obtained by a combination of primary, excess and/or umbrella insurance, and all coverage shall be at least as broad as the requirements listed in this Agreement.
- F. Any deductibles, self-insurance, or self-insured retentions (SIRs) applicable to the required insurance coverage must be declared to and accepted by the DISTRICT.
- G. At the option and request of the DISTRICT, CONTRACTOR shall provide documentation of its financial ability to pay the deductible, self-insurance, or SIR.
- H. Any policies with a SIR shall provide that any SIR may be satisfied, in whole or in part, by the DISTRICT or the additional insured at its sole and absolute discretion.

- I. Unless otherwise accepted by the DISTRICT, all required insurance must be placed with insurers with a current A.M. Best's rating of no less than A- V.
- J. CONTRACTOR shall defend the DISTRICT and pay any damages as a result of failure to provide the waiver of subrogation from the insurance carrier.
- K. For any coverage that is provided on a claims-made coverage form (which type of form is permitted only where specified) the retroactive date must be shown and must be before the date of this Agreement, and before the beginning of any Services related to this Agreement.
- L. Insurance must be maintained, and updated Verification of Insurance be provided to the DISTRICT before the expiration of insurance by having CONTRACTOR's insurance broker or agent update, sign and return Exhibit B to the DISTRICT's contract manager. For all claims-made policies the updated Verification of Insurance must be provided to the DISTRICT for at least three (3) years after expiration of this Agreement.
- M. If claims-made coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the effective date of this Agreement or the start of any Services related to this Agreement, CONTRACTOR must purchase an extended reporting period for a minimum of three (3) years after expiration of the Agreement.
- N. If requested by the DISTRICT, a copy of the policies' claims reporting requirement must be submitted to the DISTRICT for review.
- O. Where additional insured coverage is required, the additional insured coverage shall be "primary and non-contributory," and will not seek contribution from the DISTRICT's insurance or self-insurance.
- P. CONTRACTOR agrees to provide immediate Notice to the DISTRICT of any loss or claim against CONTRACTOR arising out of, pertaining to, or in any way relating to this Agreement, or Services performed under this Agreement. The DISTRICT assumes no obligation or liability by such Notice but has the right (but not the duty) to monitor the handling of any such claim or claims if they are likely to involve the DISTRICT.
- Q. CONTRACTOR agrees, upon request by the DISTRICT, to provide complete, certified copies of any policies and endorsements within 10 days of such request (copies of policies may be redacted to eliminate premium details.)
- R. It is CONTRACTOR's responsibility to ensure its compliance with the insurance requirements. Any actual or alleged failure on the part of the DISTRICT to obtain proof of insurance required under this Agreement shall not in any way be construed to be a waiver of any right or remedy of the DISTRICT, in this or any regard.
- S. Notice of Cancellation/Non-Renewal/Material Reduction The insurance requirements hereunder are mandatory, and the DISTRICT may, at its sole and absolute discretion, terminate the services provided by CONTRACTOR, should CONTRACTOR breach its obligations to maintain the required coverage and limits set forth in this Agreement. No coverage required hereunder shall be cancelled, non-renewed or materially reduced in coverage or limits without the DISTRICT being provided at least thirty (30) days prior written notice, other than cancellation for the non-payment of premiums, in which event the DISTRICT shall be provided ten (10) days prior written notice. Replacement of coverage with another

policy or insurer, without any lapse in coverage or any reduction of the stated requirements does not require notice beyond submission to the DISTRICT of an updated Verification of Insurance which shall be met by having the CONTRACTOR's insurance broker or agent update, sign and return this EXHIBIT B.

**I. Workers' Compensation and Employer's Liability Insurance Coverage**

- A. Workers' Compensation insurance including Employer's Liability insurance with minimum limits as follows:
  - Coverage A. Statutory Benefits Limits
  - Coverage B. Employer's Liability of not less than:
    - Bodily Injury by accident: \$1,000,000 each accident
    - Bodily Injury by disease: \$1,000,000 each employee
    - Bodily Injury by disease: \$1,000,000 policy limit
- B. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- C. If there is an onsite exposure of injury to CONTRACTOR, subcontractor, and/or subcontractor's employees under the U.S. Longshore and Harbor Workers' Compensation Act, the Jones Act, or under laws, regulations or statutes applicable to maritime employees, coverage is required for such injuries or claims.
- D. If CONTRACTOR is self-employed, a sole proprietorship or a partnership, with no employees, and is exempt from carrying Workers' Compensation Insurance, CONTRACTOR must return the completed Verification of Insurance confirming that CONTRACTOR has no employees and is exempt from the State of California Workers' Compensation requirements.
- E. If CONTRACTOR is self-insured with respect to Workers' Compensation coverage, CONTRACTOR shall provide to the DISTRICT a Certificate of Consent to Self-Insure from the California Department of Industrial Relations. Such self-insurance shall meet the minimum limit requirements and shall waive subrogation rights in favor of the DISTRICT as stated below in section "F."
- F. Waiver of Subrogation. Workers' Compensation policies, including any applicable excess and umbrella insurance, must contain a waiver of subrogation endorsement providing that CONTRACTOR and each insurer waive any and all rights of recovery by subrogation, or otherwise, against the DISTRICT, its directors, board, and committee members, officers, officials, employees, agents, and volunteers. CONTRACTOR shall defend and pay any and all damages, fees, and costs, of any kind arising out of, pertaining to, or in any way relating to CONTRACTOR's failure to provide waiver of subrogation from the insurance carrier.

**INSURANCE VERIFICATION DOCUMENTS**

**Verification of Workers' Compensation and Employer's Liability Insurance Coverage**

By checking the box and signing below, I hereby verify that the CONTRACTOR is exempt from the State of California's requirement to carry workers' compensation insurance.

As the CONTRACTOR's insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries workers' compensation insurance as required by this Agreement, including the relevant provisions applicable to all required insurance.

Self-Insured Retention Amount: \$ \_\_\_\_\_

Policy Limit: \$ \_\_\_\_\_

Policy Number: \_\_\_\_\_

Policy Period: from: \_\_\_\_\_ to: \_\_\_\_\_

Insurance Carrier Name: \_\_\_\_\_

Insurance Broker or Agent: Print Name: \_\_\_\_\_

Insurance Broker or Agent's Signature: \_\_\_\_\_

## II. Commercial General Liability Insurance (“CGL”) Coverage

- A. CONTRACTOR’s insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- C. Minimum Requirements. CGL insurance with minimum per occurrence and aggregate limits as follows:
- |                                    |  |
|------------------------------------|--|
| Bodily Injury and Property Damage  | \$2,000,000 per occurrence & aggregate |
| Personal Injury/Advertising Injury | \$2,000,000 per occurrence & aggregate |
| Products/Completed Operations      | \$2,000,000 per occurrence & aggregate |
- D. Coverage must be on an occurrence basis.
- E. Coverage for Products, and Completed Operations, and Ongoing Operations must be included in the insurance policies and shall not contain any “prior work” coverage limitation or exclusion applicable to any Services performed by CONTRACTOR and/or subcontractor under this Agreement.
- F. Insurance policies and Additional Insured Endorsement(s) Coverage shall be included for all premises and operations in any way related to this Agreement.
- G. There will be no exclusion for explosions, collapse, or underground liability (XCU).
- H. Insurance policies and Additional Insured Endorsement(s) shall not exclude liability and damages to work arising out of, pertaining to, or in any way relating to services performed by Subcontractor on CONTRACTOR’s behalf.
- I. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONTRACTOR under this Agreement as an “insured contract.”
- J. Waiver of Subrogation. The policy shall be endorsed to include a Waiver of Subrogation ensuring that the CONTRACTOR and its insurer(s) waive any rights of recovery by subrogation, or otherwise, against the DISTRICT, its directors, board, and committee members, officers, officials, agents, volunteers, and employees. CONTRACTOR shall defend and pay any and all damages, fees, and costs, of any kind, arising out of, pertaining to, or in any way resulting from CONTRACTOR’s failure to provide the waiver of subrogation from its insurance carrier(s).

- K. "Independent CONTRACTOR's Liability" shall not limit coverage for liability and/or damages arising out of, pertaining to, or in any way resulting from Services provided under this Agreement.

To the fullest extent permitted by law, the DISTRICT, its directors, board, and committee members, officers, officials, employees, agents, and volunteers must be covered as Additional Insureds on a primary and noncontributory basis on all underlying, excess and umbrella policies that shall be evidenced in each case by an endorsement. The Additional Insureds must be covered for liability arising in whole, or in part, from any premises, Products, Ongoing Operations, and Completed Operations by or on behalf of CONTRACTOR, in any way related to Services performed under this Agreement.

- L. A severability of interest provision must apply for all the Additional Insureds, ensuring that CONTRACTOR's insurance shall apply separately to each insured against whom a claim is made, or suit is brought, except with respect to the policies' limit(s).

**Verification of Commercial General Liability (CGL) Insurance Coverage**

**As the CONTRACTOR'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Commercial General Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance:**

**Self-Insured: Amount: \$** \_\_\_\_\_

**Policy Limit: Per Occurrence: \$** \_\_\_\_\_ **Aggregate: \$** \_\_\_\_\_

**Policy Number:** \_\_\_\_\_

**Policy Period: from:** \_\_\_\_\_ **to:** \_\_\_\_\_

**Insurance Carrier Name:** \_\_\_\_\_

**Insurance Broker or Agent: Print Name:** \_\_\_\_\_

**Insurance Broker or Agent's Signature:** \_\_\_\_\_

### III. Business Auto Liability Insurance Coverage

CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.

A. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.

B. Minimum Requirements. Auto insurance with minimum coverage and limits as follows:  
Each Occurrence Limit (per accident) and in the Aggregate: \$2,000,000  
Bodily Injury and Property Damage: \$2,000,000

C. Coverage must include either "owned, non-owned, and hired" autos or "any" automobile

This provision ensures the policy covers losses arising out of use of company-owned vehicles ("owned autos"), employee's personal autos ("non-owned autos" meaning not owned by company/insured) or autos that are rented or leased ("hired autos").

D. If CONTRACTOR is transporting hazardous materials or contaminants, evidence of the Motor Carrier Act Endorsement-hazardous materials clean-up (MCS-90, or its equivalent) must be provided.

E. If CONTRACTOR's Scope of Services under this Agreement exposes a potential pollution liability risk related to transport of potential pollutants, seepage, release, escape or discharge of any nature (threatened or actual) of pollutants into the environment arising out of, pertaining to, or in any way related to CONTRACTOR's and/or Subcontractor's performance under this Agreement, then Auto Liability Insurance policies must be endorsed to include Transportation Pollution Liability insurance. Alternatively, coverage may be provided under the CONTRACTOR's Pollution Liability Policies if such policy has no exclusions that would restrict coverage under this Agreement. Coverage shall also include leakage of fuel or other "pollutants" needed for the normal functioning of covered autos.

F. To the fullest extent permitted by law, the DISTRICT, its directors, board, and committee members, officers, officials, employees, agents, and volunteers must be covered as Additional Insureds on a primary and noncontributory basis on all underlying and excess and umbrella policies. The Additional Insureds must be covered for liability arising in whole, or in part, from any premises, Products, Ongoing Operations, and Completed Operations by or on behalf of CONTRACTOR, in any way related to Services performed under this Agreement.

- G. A severability of interest provision must apply for all the Additional Insureds, ensuring that CONTRACTOR's insurance shall apply separately to each insured against whom a claim is made, or suit is brought, except with respect to the insurer's limits of liability.

**Verification of Business Auto Liability Insurance Coverage**

**As the CONTRACTOR'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Business Automobile Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance:**

**Self-Insured: Amount: \$** \_\_\_\_\_

**Policy Limit: Per Accident/Occurrence \$** \_\_\_\_\_ **Aggregate: \$** \_\_\_\_\_

**Policy Number:** \_\_\_\_\_

**Policy Period: from:** \_\_\_\_\_ **to:** \_\_\_\_\_

**Insurance Carrier Name:** \_\_\_\_\_

**Insurance Broker or Agent: Print Name:** \_\_\_\_\_

**Insurance Broker or Agent's Signature:** \_\_\_\_\_



#### **IV. Professional Liability (also known as Errors and Omissions) Insurance Coverage**

- A. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- C. Minimum Requirements: Professional Liability Insurance with minimum limits as follows:

Each Claim or Occurrence Limit:	\$2,000,000
Aggregate Limit:	\$2,000,000
- D. If Coverage is written on a claims-made form, the following shall apply:
  - 1. The retroactive date must be shown and must be before the date of the Agreement or the beginning of the Services.
  - 2. Insurance must be maintained, and evidence of insurance must be provided for a minimum of three (3) years after completion of the Services.
  - 3. If claims-made coverage is canceled or non-renewed, and not replaced with another claims-made policies form with a retroactive date prior to the effective date of the Agreement, CONTRACTOR must purchase an extended period of coverage for a minimum of three (3) years after completion of the Services.
- E. Insurance shall include prior acts coverage sufficient to cover the services under this Agreement.
- F. Coverage shall be included for all premises and operations in any way related to this Agreement.

**Verification of Professional Liability (Errors and Omissions) Insurance Coverage**

As the CONTRACTOR'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Professional Liability insurance as required by this Agreement, including the relevant provisions applicable to all required insurance.

Self-Insured: Amount: \$ \_\_\_\_\_

Policy Limit: Per Claim \$ \_\_\_\_\_ Aggregate: \$ \_\_\_\_\_

Policy Number: \_\_\_\_\_

Policy Period: from: \_\_\_\_\_ to: \_\_\_\_\_

Insurance Carrier Name: \_\_\_\_\_

Insurance Broker or Agent: Print Name: \_\_\_\_\_

Insurance Broker or Agent's Signature: \_\_\_\_\_

## V. Pollution Liability Insurance Coverage

- A. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- C. Minimum Requirements: Pollution Liability Insurance with minimum limits, as follows:
  - Each Claim or Occurrence Limit:     \$2,000,000;
  - Aggregate Limit:                     \$2,000,000.
- D. Coverage must be included for bodily injury and property damage, including coverage for loss of use and/or diminution in property value, and for clean-up costs arising out of, pertaining to, or in any way related to the actual, alleged or threatened discharge, dispersal, seepage, migration, release or escape of contaminants or pollutants, arising out of, pertaining to, or in any way resulting from any Services performed by CONTRACTOR under this Agreement; including any transportation of hazardous wastes, hazardous materials, or contaminants.
- E. If Coverage is written on a claims-made form, the following shall apply:
  - 1. The retroactive date must be shown and must be before the date of the Agreement or the beginning of the Services.
  - 2. Insurance must be maintained, and evidence of insurance must be provided for a minimum of three (3) years after completion of the Services.
  - 3. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the effective date of the Agreement, CONTRACTOR must purchase an extended period of coverage for a minimum of three (3) years after completion of the Services.
- F. Insurance shall include prior acts coverage sufficient to cover the services under this Agreement.

Verification of Pollution Liability Insurance Coverage

As the CONTRACTOR'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Pollution Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance.

Self-Insured Amount: \$ \_\_\_\_\_

Policy Limit: Per Claim \$ \_\_\_\_\_ Aggregate: \$ \_\_\_\_\_

Policy Number: \_\_\_\_\_

Policy Period: from: \_\_\_\_\_ to: \_\_\_\_\_

Insurance Carrier Name: \_\_\_\_\_

Insurance Broker or Agent: Print Name: \_\_\_\_\_

Insurance Broker or Agent's Signature: \_\_\_\_\_

## **VI. Excess and/or Umbrella Liability Insurance Coverage**

- A. CONTRACTOR's insurance shall be primary, and any insurance or self-insurance procured or maintained by the DISTRICT shall not be required to contribute to it.
- B. The insurance requirements under this Agreement shall be the greater of (1) the minimum coverage and limits specified in this Agreement; or (2) the broader coverage and maximum limits of coverage of any insurance policies or proceeds available to the Named Insured. It is agreed that these insurance requirements shall not in any way act to reduce coverage that is broader or that includes higher limits than the minimums required herein. No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of the CONTRACTOR.
- C. Minimum Requirements: It is expressly understood by the parties that CONTRACTOR's Excess and/or Umbrella Liability policies shall, at minimum, comply with all insurance requirements set forth within this Agreement.
1. Coverage for Products, Completed Operations, and Ongoing Operations must be included in the insurance policies and shall not contain any "prior work" coverage limitation or exclusion applicable to any Services performed under this Agreement and, if it is a claims-made policy, it must be maintained for a minimum of three (3) years following final completion of the Services.
  2. Coverage shall be included for all premises and operations in any way related to this Agreement.
  3. There will be no exclusion for explosions, collapse, or underground damage (XCU).
  4. Insurance policies and Additional Insured Endorsements shall not exclude coverage for liability and damages from services performed by Subcontractor on CONTRACTOR's behalf.
  5. Contractual liability coverage shall be included and shall not limit, by any modification or endorsement, coverage for liabilities assumed by CONTRACTOR under this Agreement as an "insured contract."
  6. "Independent CONTRACTOR's Liability" shall not limit coverage for liability and/or damage arising out of, pertaining to, or in any way related to Services provided under this Agreement.
  7. To the fullest extent permitted by law, the DISTRICT, its directors, officers, officials, agents, volunteers, and employees must be covered as Additional Insureds on a primary and noncontributory basis on all excess and umbrella policies. The Additional Insureds must be covered for liability arising in whole or in part from any premises, Products, Ongoing Operations, and Completed Operations by or on behalf of CONTRACTOR, in any way related to Services performed under this Agreement.

8. A severability of interest provision must apply for all the Additional Insureds, ensuring that the CONTRACTOR's insurance shall apply separately to each insured against whom a claim is made, or suit is brought, except with respect to the policy's limits.
  9. CONTRACTOR and its excess and/or umbrella Liability insurance coverage must waive any rights of subrogation against the DISTRICT, its directors, officers, officials, employees, agents, and volunteers, and CONTRACTOR shall defend and pay any damages as a result of failure to provide the waiver of subrogation from the insurance carrier(s).
- D. CONTRACTOR shall defend and pay any damages as a result of failure to provide the waiver of subrogation from the insurance carrier(s).

**Verification of Excess and/or Umbrella Liability Insurance Coverage**

**As the CONTRACTOR'S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Excess and/or Umbrella Liability insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance.**

**Self-Insured: Amount: \$** \_\_\_\_\_

**Policy Number:** \_\_\_\_\_

**Policy Period: from:** \_\_\_\_\_ **to:** \_\_\_\_\_

**Insurance Carrier Name:** \_\_\_\_\_

**Insurance Broker or Agent: Print Name:** \_\_\_\_\_

**Insurance Broker or Agent's Signature:** \_\_\_\_\_

**VIII. Builders Risk Insurance Coverage**

A. Builder’s Risk (Course of Construction). During all phases of construction and/or renovation work, Contractor shall maintain builder’s risk insurance covering “Special Form” risks of direct physical loss, including, but not limited to, fire, theft, water, explosion, vandalism, mechanical breakdown, electrical arcing, ordinance or law, in an amount sufficient to cover the total value of the structure(s), without co-insurance penalties. Such coverage shall include all items of labor and material, soft costs such as loss of income, architect and engineer fees, building permits and any other non-recurring costs as may be appropriate for Contractor.

1. The policy shall include as insureds the Contractor, all subcontractors, and the District.
2. The policy shall include as insureds the Contractor, all subcontractors, and the District.
3. A severability of interest provision must apply for all the Additional Insureds, ensuring that the CONTRACTOR’s insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the policy’s limits.
4. Contractor’s Tools and Equipment. Contractor is solely responsible for maintaining insurance for any tools owned or used by Contractor, and any tools, equipment, scaffoldings, staging, towers, and forms, rented or owned by the Contractor and or its subcontractors, the value of which is not included in the cost of the Work, or any shanties or other structures erected for the sole convenience of the workers.
5. In the event of a loss by the perils insured against, of any or all of the Work and/or materials herein provided for, at any time prior to Contract Completion and acceptance by the District, the Contractor shall promptly reconstruct, repair, replace or restore all work or materials so destroyed.
6. Nothing herein provided for shall in any way excuse the Contractor or its surety from the obligation of furnishing all the required materials and completing the Work in full compliance with the terms of the Contract.
7. Value of the materials furnished to the Contractor by the District is stated under Section 01 64 05 – District-Furnished Materials.

**Verification of Builders Risk Insurance Coverage**

**As the CONTRACTOR’S insurance broker/agent, I hereby verify that I have reviewed and confirmed that the CONTRACTOR carries Builders Risk insurance, as required by this Agreement, including the relevant provisions applicable to all required insurance.**

**Self-Insured: Amount: \$ \_\_\_\_\_**

**Policy Limit: Per Claim \$ \_\_\_\_\_ Aggregate: \$ \_\_\_\_\_**

**Policy Number: \_\_\_\_\_**

**Policy Period: from: \_\_\_\_\_ to: \_\_\_\_\_**

**Insurance Carrier Name: \_\_\_\_\_**

**Insurance Broker or Agent: Print Name: \_\_\_\_\_**

**Insurance Broker or Agent’s Signature: \_\_\_\_\_**

# **EXHIBIT C – GENERAL CONDITIONS**



**GENERAL SERVICES AGREEMENT CONDITIONS**

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# GENERAL CONDITIONS

## ARTICLE 1 - GENERAL PROVISIONS

### 1.1 Interpretation

1.1.1 The following interpretative rules apply throughout the Contract Documents.

- .1 The provisions of the Contract Documents are complementary and should be interpreted viewing the Contract Documents as a whole.
- .2 A concept phrased in the singular should be interpreted in the plural as required.
- .3 Masculine includes feminine, and feminine includes masculine.
- .4 The words “shall,” “will” and “must,” in any of their tenses, indicate mandatory requirements.
- .5 The use of examples like “such as” or “including” does not limit or exclude examples not specifically mentioned.
- .6 The words “provide,” “perform,” “construct,” and “install” mean, unless preceded by the word “only,” that the Contractor shall provide, perform, construct, and install and include all services necessary to provide, perform, construct and install.

### 1.2 Definitions

1.2.1 Throughout the Contract Documents, the terms below will have the following defined meanings:

- .1 **Act of God:** An occurrence or condition and effect as defined in Public Contract Code §7105.
- .2 **Addendum:** A written change, clarification, or correction to the Contract Documents issued by the East Bay Municipal Utility District prior to bid opening.
- .3 **Bidder:** Any vendor, individual, partnership, joint venture, or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.
- .4 **Board or Board of Directors:** The Board of Directors of the East Bay Municipal Utility District.

- .5 Business Entity:** Any individual, business, partnership, joint venture, corporation, sole proprietorship, or other private legal entity recognized by statute.
- .6 Change Order:** A Change Order is a written instrument used for modifying the contract with regards to the scope of Work, Contract Sum, and/or Contract Time. An approved Change Order is a Change Order signed by the District. An executed Change Order is a Change Order signed by both the District and the Contractor.
- .7 Compensable Delay:** A period of delay to the Contractor's performance of the Work that meets all of the following criteria:
- a) the delay directly prevents the Contractor from performing critical path Work;
  - b) the delay is caused directly and solely by the District or by causes within the exclusive control of the District;
  - c) the delay is not concurrent with any other type of delay;
  - d) the delay could not have been avoided by the Contractor through work-arounds, rescheduling or other mitigation measures; and
  - e) the Contractor gave timely notice of the delay to the District in compliance with the terms of this contract.
- .8 Concurrent Delay:** Two or more independent causes of delay to the Contractor's performance of the Work that meet all of the following criteria:
- a) the delays occur at the same time during all or a portion of the delay period being considered;
  - b) the delays directly prevent the Contractor from performing critical path Work;
  - c) each of the delays would have delayed the Contractor's performance of critical path work even in the absence of any of the other delays;
  - d) none of the delays could have been avoided by the Contractor through work-arounds, rescheduling or other mitigation measures required under this contract; and
  - e) the Contractor gave timely notice of the delays to the District in compliance with the terms of this contract.
- .9 Contract Completion:** The Work has been fully completed in accordance with the Contract Documents as determined by the Engineer and all governmental authorities with jurisdiction over the project have issued acceptance or a certificate of occupancy.
- .10 Contract Documents:** See Article 1.3.
- .11 Contract Sum:** The contract price stated in the signed General Services Agreement plus all Approved Change Orders.

- .12 Contract Time:** The number of days set forth in the contract to achieve Contract Completion. The required completion date is computed by adding the number of days to the effective date of the Notice to Proceed. If the required completion date falls on a District holiday or non-Work Day, that day is excluded and the following Work Day is counted. The Contract Time may only be adjusted by approved Change Order.
- .13 Contractor:** The Business Entity with whom the District enters into a contractual agreement. Contractor shall be synonymous with “supplier”, “vendor”, “consultant” or other similar term.
- .14 Critical Path:** The sequence of schedule activities that determines the duration of the Work.
- .15 Day:** Unless otherwise specified, days are calendar days, measured from midnight to the next midnight.
- .16 Deficiency Notice:** A written notice issued by the Engineer informing the Contractor of non-conforming Work.
- .17 District:** The East Bay Municipal Utility District.
- .18 Engineer:** The Director of Engineering and Construction or the Director of Wastewater of the District acting directly or through authorized agents acting within the duties entrusted to them.
- .19 Excusable Delay:** A period of delay to the Contractor’s performance of the Work that meets all of the following criteria:
- a) the delay prevents the Contractor from performing critical path work;
  - b) the delay is directly caused by events beyond the control of both the District and the Contractor (including, but not limited to, adverse weather);
  - c) the delay is not concurrent with an Inexcusable Delay as defined in this contract;
  - d) the delay could not have been avoided by the Contractor through work-arounds, rescheduling or other mitigation measures required under the contract; and
  - e) the Contractor gave timely notice of the delay to the District in compliance with the terms of this contract.
- .20 Fixed Costs (also known as Fixed Price):** Any necessary labor, material, and equipment costs directly expended which remain constant regardless of the quantity of work done.
- .21 Force Account:** Method of compensation for Work performed that is billed at actual cost for labor, materials, equipment, taxes and other costs plus a specified

percentage of markup for overhead and profit. Compensation rate for certain cost elements may be specified in the contract.

- .22 Force Majeure:** An event of force majeure is an event or circumstance which is beyond the control and without the fault or negligence of the Contractor or the District, and which by the exercise of reasonable diligence the Contractor or the District is unable to anticipate or prevent, provided that the event or circumstance is limited to: adverse weather conditions, including, but not limited to, National Weather Service Red Flag Warnings, public safety power shutoffs, drought, fires, or floods; wars; civil or military disturbances; acts of terrorism; epidemics; acts of civil or military authority; or governmental actions, that affect the Contractor's or District's ability to perform its contractual scope of work.
- .23 Free Float (also known as Activity Float):** The amount of time that a scheduled activity can be delayed without delaying the early start of any immediately following schedule activity.
- .24 Goods:** Off-the-shelf software and all types of tangible property, including but not limited to materials, supplies, and equipment.
- .25 Inexcusable Delay:** A period of delay to the Contractor's performance of the Work caused by circumstances within the Contractor's control or within the scope of the Contractor's contract responsibilities. Delays attributable to or within the control of a Subcontractor of any tier, or a Supplier, shall be deemed to be delays within the control of the Contractor. Inexcusable Delays include, but are not limited to, any of the following:
- a) delays caused by the Contractor's failure to perform its cooperation and coordination responsibilities required by this contract;
  - b) delays caused by the District's enforcement of any government act or regulation, or the provisions of the contract;
  - c) delays caused by the District's right to sequence the Work in a manner that would avoid disruption to the District's tenants, customers, contiguous property owners, and their contractors or other prime contractors and their respective Subcontractors;
  - d) any delay that is neither a Compensable Delay nor Excusable Delay as defined in this contract; and
  - e) delays of any kind that the Contractor fails to give timely notice to the District in compliance with the terms of this contract.
- .26 Lump Sum Price:** Pricing arrangement where the Contractor agrees to perform the scope of work for a fixed price that cannot be adjusted unless there is a Change Order. For the purpose of this contract, the terms Lump Sum Price and Fixed Price adjustment are used interchangeably.

- .27 Notice to Proceed:** A written directive, issued by the District, authorizing the Contractor to start performance of the work and establishing date of commencement of the work. The effective date is the date the Contractor acknowledges receipt of the Notice to Proceed or five days from mailing, whichever is earlier.
- .28 Shop Drawings:** Includes all drawings, specifications, diagrams, calculations, illustrations, product samples, brochures, catalog cuts, schedules, and other data which are prepared by the Contractor, a Subcontractor, tier-subcontractor, manufacturer, Supplier, or distributor, illustrating how specific portions of the Work shall be fabricated or installed.
- .29 Shoring:** A temporary structural system designed to support any and all loads for the purposes of excavation. Sloping of the soil shall not be considered as shoring.
- .30 Subcontractor:** The person or persons, co-partnership, firm or entity in direct contract with the Contractor or with any other Subcontractor for the purpose of furnishing materials, equipment, and/or performing a part of the contract Work.
- .31 Superintendent:** The Contractor's authorized on-site representative in charge of supervising the Work. Instructions and information given by the Engineer to the Superintendent shall be considered to have been given to the Contractor.
- .32 Supplier:** A manufacturer, fabricator, distributor, or any person or organization who supplies materials or equipment for the contract Work, including that fabricated to a special design, but who does not ordinarily perform labor at the jobsite.
- .33 Total Float:** The amount of time that a schedule activity may be delayed from its early start without delaying the Contract Completion date, or violating a schedule constraint.
- .34 Underground Utilities:** All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities that are installed underground to furnish any of the following services or materials: water, sewage and drainage removal, electricity, gases, steam, liquid petroleum products, telephone or other communication systems, cable television, traffic, or other control or information systems.
- .35 Unit Price:** Pricing arrangement in which the total amount of compensation for performance of the work is computed by multiplying the actual quantity of Work performed by the line item unit price except as noted in Article 7.5. Measurement of the quantity of work performed shall be determined by the Engineer.

**.36 Work:** All labor, material, equipment, submittal, and appurtenances required to be furnished to properly fulfill the Contractor's obligations as required by the Contract Documents.

**.37 Work Day:** Unless specified elsewhere, work day includes all days of the year except Saturdays, Sundays, and District Holidays.

### **1.3 Contract Documents**

**1.3.1** The Contract Documents comprise the entire agreement between the District and the Contractor concerning the Work. The Contractor shall properly perform all requirements of the Contract Documents.

**1.3.2** The Contract Documents include the District's General Services Agreement and any exhibits attached thereto, purchase order, Request for Proposal (RFP), Request for Quotation (RFQ) or Contractor response packet, drawings, specifications, addenda, and approved Change Orders or amendments, if any.

**1.3.3** The Contract Documents are intended to be complementary and include all items necessary for the Contractor's proper execution and completion of the Work. Anything mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be as if shown or mentioned in both. Any part of the Work not shown or mentioned on the drawings or in the specifications that is reasonably implied by either, or is necessary or usual for proper performance of the Work, shall be provided by the Contractor at its expense.

**.1** In the case of conflicts, errors, or discrepancies in any of the Contract Documents, the order of precedence is as follows. Within the same order of precedence, specific requirements shall take precedence over general requirements.

1. Approved change Orders
2. Addenda
3. RFQ or RFP
4. General Services Agreement General Conditions
5. Referenced Standard Specifications and Drawings
6. Contractor's Response packet
7. Referenced Standard Specifications

**.2** With reference to the Drawings:

1. Numerical dimensions govern over scaled dimensions
2. Detailed drawings govern over general drawings
3. Addenda/Change Order drawings govern over contract drawings



4. Contract drawings govern over standard drawings
  5. Notes apply only to the drawing where the notes appear, unless classified as “typical” or intended to apply elsewhere in which case they apply to all drawings where the conditions or circumstance noted occurs
  6. Typical details apply to all drawings unless a specific different detail is shown
- 1.3.4 “Related Sections” are referenced solely for the convenience of the Contractor and its Subcontractors and Suppliers, but does not, whether by omission or otherwise, lessen the requirements of the specification section where the related section is referenced.
- 1.3.5 Command type sentences used in the specifications refer to and are directed to the Contractor.
- 1.3.6 No interest in the contract shall be transferred to any other party without permission of the Board of Directors.

## **ARTICLE 2 - RIGHTS-OF-WAY AND PROPERTY**

### **2.1 Provided by the District**

- 2.1.1 The District will provide reasonable access to the site for performance of the Work. Upon approval by the Engineer, the Contractor may use a suitable portion of the District's rights-of-way or property for working space and for storage of equipment and materials. The Contractor is responsible for any damage resulting from its use of the District's rights-of-way or property and shall return and restore it to its pre-existing condition. The District will not be responsible for any loss or damage to equipment or materials stored on the work site or on the District's rights-of-way or property.
- 2.1.2 The Contractor does not have exclusive use of the site or the rights-of-way and must coordinate its use with the District and others.

### **2.2 Additional Property**

- 2.2.1 If the Contractor's operations cause the contractor to require additional property that is not within the District's rights-of-way or property for its operations, the Contractor shall, at its own expense, arrange with the property owners to use the additional property.
- 2.2.2 Agreements with property owners for storing materials and equipment, or other purpose related to the Work shall be made in writing with a copy submitted to the Engineer.

## **ARTICLE 3 - ADMINISTRATION OF THE CONTRACT**

### **3.1 Authority of the Engineer**

**3.1.1** The decision of the Engineer will be final and binding on both parties with respect to all questions concerning the intent of the Contract Documents, the acceptability of material or equipment, the classification of material, the execution of the Work, and/or conflicting interests of separate contractors performing related work.

### **3.2 Inspection and Non-Conforming Work**

**3.2.1** All materials furnished and Work completed under the contract is subject to inspection by the Engineer. The Engineer's inspections are solely for the District's benefit and do not constitute acceptance of any of the Contractor's work or waiver of the requirement that the Contractor's work conform to the requirements of the Contract Documents. The Contractor shall furnish, without extra charge, all necessary test pieces and samples, including facilities and labor for obtaining those pieces, as requested by the Engineer. The Engineer will have safe access to the work site or shop where the work, material or equipment subject to inspection is being performed or manufactured or where any off-site work is being performed, including shops, sites, and assembly facilities of Subcontractors and Suppliers.

**3.2.2** All material, equipment or Work that does not conform to the Contract Documents is non-conforming work and will be rejected regardless of whether it may have been inspected by the Engineer or its representative. Installation of unapproved materials and equipment is non-conforming work until the materials or equipment are approved by the Engineer. Deficiency Notices may be issued by the Engineer to advise the Contractor of non-conforming work. However, lack of a Deficiency Notice shall not waive the Contractor's obligation to correct any and all non-conforming work, patent or latent, through the expiration of the warranty period, or other such longer period as specified in the Contract Documents.

**3.2.3** Within 10 Work Days after receipt of a Deficiency Notice, the Contractor shall submit its proposal and schedule for correcting all non-conforming work. The District may withhold 150% of the installed value identified or such reasonable costs as determined by the Engineer until the non-conforming work is completed in accordance with the requirements of the Contract Documents. Additional costs for engineering, observation, administrative, clerical or other work associated with or resulting from the Contractor's failure to perform its work in conformance with the Contract Documents shall be borne solely by the Contractor, and the Engineer may elect to deduct the District's additional costs from any future payments to the Contractor. If the Contractor refuses or neglects to replace the non-conforming work, the District may correct or replace the non-conforming work at the Contractor's expense. The District's expenses in correcting any non-conforming

work will be calculated as fully burdened costs for labor, plus actual costs for materials and equipment, plus a 15% markup on materials and equipment.

- 3.2.4** Work completed without the Engineer's inspection and approval may be required to be reconstructed or replaced upon the Engineer's inspection. Work covered without prior approval of the Engineer may be required to be uncovered to the extent necessary for the Engineer to determine if the covered Work is satisfactory. The entire cost of replacing or uncovering and re-covering the Work, including the cost of materials furnished by the District, shall be borne by the Contractor, whether or not the Work uncovered or replaced is found to be defective.

### **3.3 Lines, Grades, and Measurements**

- 3.3.1** Lines and grades will be established by the Engineer, unless otherwise noted, and the Contractor shall provide such assistance and materials as may be required. The Contractor shall be responsible for transferring grades from the survey stakes provided by the Engineer. The Contractor shall carefully preserve all stakes and reference points. Should any stakes, points or monuments be removed or destroyed without the approval of the Engineer, the stakes, points or monuments shall be reset, as necessary, at the Contractor's expense.
- 3.3.2** The Contractor shall inform the Engineer at least four full Work Days in advance of the times and places that the Contractor requires establishment of lines, grades, or quantity surveys.
- 3.3.3** If the Contractor fails to provide timely notice to the Engineer regarding its survey requirements, no compensation will be made for the impact to the Contractor for resulting delays.

### **3.4 Disputes and Claims**

#### **3.4.1 Disputes**

- .1** If the Engineer issues an order or decision that requires the Contractor to perform Work that the Contractor believes is not required by the Contract Documents, the Contractor shall, within 48 hours of the order or decision, notify the Engineer in writing that it disputes the order or decision. The Contractor's notice shall include the date and circumstances of the Engineer's order or decision and the detailed basis for disputing the order or decision. Regardless of the basis of the dispute, the Contractor shall immediately perform the disputed Work or conform to the Engineer's order or decision.
- .2 Notice of Intent To File a Claim:** The Engineer will consider and investigate the dispute and issue a written and final decision regarding the dispute. If the Contractor disagrees with the Engineer's final decision, the Contractor shall, within 10 days of receipt of the decision, send the Engineer a written Notice of Intent To File a Claim.

- .3 **Waiver:** Failure of the Contractor to comply with the notifications of Articles 3.4.1.1 and 3.4.1.2 within the specified time constitutes a waiver of the Contractor's right to assert a Claim concerning such matter.

### 3.4.2 Claims

- .1 **Time to Submit Claim:** The Contractor shall submit a written Claim within 30 days after submitting a Notice of Intent to File a Claim. The Claim shall relate directly to the circumstances addressed in the Notice of Intent to File a Claim, must identify the date of the Notice of Intent to File a Claim to which the Claim relates, and may not raise new issues or circumstances that were not identified in the Notice of Intent to File a Claim. The Claim shall clearly state that it is a Claim being submitted under this Article. Failure to submit a written Claim within the 30-day period waives any right to recover compensation or obtain an extension of Contract Time due to the issues referenced in the Notice of Intent to File a Claim.
- .2 **Contents of Written Claim:** The written Claim shall provide detailed information sufficient to allow the Engineer to evaluate entitlement and value of the Claim, including:
  - a) Description of the event or events giving rise to the Claim;
  - b) Identification of the date or dates of the event, or events giving rise to the Claim;
  - c) Identification of all statutory or contractual support for the Claim; and
  - d) Detailed analysis of the asserted effect on the Contract Sum and the Contract Time.
- .3 **Extensions in Contract Time:** The Claim shall provide an analysis of schedule impact that describes how the Contractor will incorporate the alleged changed Work in the schedule and how that Work impacts the current accepted schedule. The analysis of schedule impacts shall contain a written narrative and a schedule diagram depicting how the alleged changed Work affects other schedule activities and an analysis of the potential mitigation efforts. The written narrative shall describe the sequence of events surrounding the alleged change, the effect the events had or will have on the progress of the Work, an explanation regarding the cause of delay, the Contractor's mitigation efforts taken to minimize time impacts to the project, and the Contractor's determination whether additional compensation and/or an extension of the Contract Time is sought for delay. If the Contractor is requesting an extension in the Contract Time, the magnitude and cause of the delay shall be demonstrated in the analysis of schedule impacts.
- .4 **Delay Analysis Diagrams:** The analysis diagram shall be provided in an editable, electronic, file format as well as a printed copy. The results of the analysis diagram shall be tied to the affected sequence of schedule activities to

enable the Engineer to evaluate the impact to the critical path as a result of the alleged changed work. The schedule diagram shall also show logic relationships and durations of new activities associated with the alleged change and logic and duration revisions to existing schedule activities due to the alleged change and mitigations taken to minimize impacts to the project. The Contractor is responsible for requesting extensions to its Contract Time based on the analysis of schedule impact.

**.5 Adjustments to Contract Sum:** The Claim shall also provide adequate financial data supporting any request for a change in Contract Sum. The Claim shall include a detailed cost breakdown of all items claimed, including all costs associated with delays, acceleration, overhead and profit, and the computations used in determining such costs. The Contractor's proposal shall include detailed estimates with cost breakdowns for each Subcontractor whose break down will include the following categories: labor, material, equipment, overhead, and profit. Labor shall be broken down into hours and rate per hour. If applicable, the proposal shall include a breakdown for off-site labor (including factory labor, engineering, etc.). If the exact amount of a Claim is not ascertainable at the time the claim is made, the available supporting data shall be submitted and any supplemental data supporting the exact amount of the Claim shall be submitted as soon as available.

**.6 Claim Format:**

a) The Contractor shall submit the claim in the following format:

1) Cover letter and certification.

2) Summary of claim including:

(a) Underlying Facts.

(b) Entitlement.

(c) Mitigation Efforts.

(d) Calculations.

(e) Contract Provisions Supporting Relief.

3) List of documents relating to claim:

(a) Specifications.

(b) Drawings.

- (c) Clarifications/Requests For Information.
  - (d) Schedules.
  - (e) Other.
- 4) Chronology of Events and Correspondence.
- 5) Analysis of Claim Merit.
- 6) Analysis of Claim Cost.
- 7) Analysis of Schedule Impact.
- 8) Attachments:
  - (a) Specifications.
  - (b) Drawings.
  - (c) Clarifications/Requests For Information.
  - (d) Correspondence.
  - (e) Schedules.
  - (f) Other.
- b) The Contractor, through a corporate officer or general partner, shall certify under penalty of perjury pursuant to the laws of the State of California for any Claim filed on behalf of itself or its Subcontractors or Suppliers, that:
  - 1) The Claim is made in good faith;
  - 2) Supporting data are accurate and complete to the best of the Contractor's knowledge and belief; and
  - 3) The amount requested accurately reflects the contract adjustment for which the Contractor believes the District is liable.
- .7 If Contractor does not certify the Claim as required above, the Claim will be considered incomplete and subject to denial without any further recourse by, or remedy to, the Contractor.
- .8 A claim complying with the requirements of Article 3.4 by the Contractor sent to the District by registered or certified mail with return receipt requested, either

on its own behalf, or on behalf of one of its subcontractors of any tier that is a separate demand for a time extension, including without limitation, for relief from damages or penalties for delay, for money or damages arising from work done by, or on behalf of the Contractor for which payment is not otherwise provided, or to which the Contractor is not otherwise entitled, or payment of an amount disputed by the District shall be subjected to the following procedures:

- a) Upon receipt of a Claim, the District will conduct a reasonable review of the Claim and will provide to the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed within 45 days from the date of receipt. The time for providing the written statement may be extended by mutual agreement between the District and the Contractor. If the District requires approval from its governing Board, and its Board does not meet within the 45-day period from receipt of a Claim, then the 45-day period shall be extended to three days following the next duly publicly noticed meeting of the District's Board.
- b) Upon request by the District, the Contractor shall furnish reasonable documentation to support the Claim, as outlined in Article 3.4.2.
- c) Any payment due on an undisputed portion of the Claim will be paid within 60 days after the District issues the written statement referenced in Subparagraph 3.4.2.8.a, above.
- d) If the Contractor disputes the District's written statement, or if the District fails to timely respond to a Claim, the Contractor may demand in writing by registered or certified mail with "return receipt requested", an informal conference to meet and confer for settlement of the issues in dispute with the District. Within 30 days from the date of receipt of such demand to meet and confer, the District will schedule and hold a meet and confer conference, unless the timing is extended by mutual agreement of the Contractor and the District.
- e) Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the District will provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. If additional unpaid undisputed portions of the Claim are identified, payment on such undisputed portions will be made within 60 days after the District issues the written statement referenced in this Subparagraph 3.4.2.8.e.
- f) Following receipt of the District's written statement in Subparagraph 3.4.2.8.e, the Contractor may identify in writing any disputed portion of the Claim and request mediation. The disputed portion of the Claim, as identified in writing by the Contractor, shall be submitted to nonbinding

mediation. The costs of mediation shall be shared equally by the District and the Contractor. The District and the Contractor shall mutually agree to a mediator within 10 business days after the disputed portion of the Claim has been identified in writing as provided herein. If the District and the Contractor cannot agree upon a mediator, they shall each select a mediator, and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. Alternatively, the parties may agree to any nonbinding process, included but not limited to neutral evaluation or a dispute review board, and such nonbinding process shall be considered to comply with the mediation requirements set forth herein. Unless otherwise agreed by the District and the Contractor in writing, the mediation shall excuse any further obligation under Public Contract Code § 20104.4 to mediate after litigation has been commenced. The District and the Contractor may mutually agree to waive mediation in writing, at which time the procedures set forth in Article 3.4 shall be deemed complete and complied with, other than the mediation provided herein.

- g) If mediation of the disputed portion of the Claim is unsuccessful, the Contractor shall be required to follow all of the other claim procedures set forth in Article 3.4.
- h) Failure by the District to respond to a Claim within the time periods set forth herein will result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the District's failure to have responded to a Claim, or its failure to otherwise meet the time requirements of Subparagraph 3.4.2.8, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of the Contractor.
- i) Amounts not paid in a timely manner as required in Subparagraph 3.4.2.8 will bear interest at 7 percent per annum.
- j) It is intended that the provisions stated in this Subparagraph 3.4.2.8 be a summary of the requirements of Public Contract Code § 9204, and it is not intended that the provisions herein shall waive or alter the requirements of Public Contract Code § 9204, except to the extent permitted by law upon mutual written agreement by the Contractor and the District.

**.9 Condition Precedent (Government Code, Sections 930, et seq.):**

- a) The Disputes and Claims procedures set forth in Article 3.4 are the exclusive procedures for presenting any Claims and are a condition precedent to filing a Government Code Claim, which, in turn, is a condition precedent to the right to initiating any action against the District related to



the Claim. Failure to comply with the Disputes and Claims procedures offset forth in Article 3.4 is a waiver of any Claim arising from or related to the facts and circumstances described in the Claim or the Notice of Intent to File a Claim.

- .10 The parties specifically and expressly agree that Government Code, Section 12650, et seq., applies. If a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Government Code, Section 12650, et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.
- .11 Under no circumstances will the Contractor be entitled to indirect, consequential, special and incidental damages.

## **ARTICLE 4 - CONTRACTOR'S RESPONSIBILITIES**

### **4.1 Responsibility of the Contractor**

- 4.1.1 Means and Methods.** The Contractor shall complete the entire Work to the satisfaction of the Engineer in accordance with the Contract Documents. The Contractor is solely responsible for the means, methods, techniques, sequence, scheduling, workforce, and procedures of construction unless otherwise specified. The Contractor is solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with performance of Work under the contract and shall comply and enforce all Cal/OSHA requirements on this project. The Contractor is the "controlling employer" for this project as defined by Cal/OSHA.
- 4.1.2 Work.** The Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, transportation, utilities, and other facilities and services required for the proper execution and completion of the Work included in this contract.
- 4.1.3 Permit, Fee and Licenses.** Unless otherwise specified, the Contractor shall secure and pay for all licenses, royalties, government fees, and permits necessary for proper execution and completion of the Work. The Contractor shall give notices as required by permits prior to commencement of the Work, and provide copies of all permits to the Engineer before starting on the Work.
- 4.1.4 Contractor's Licensing Requirements.** The Contractor shall have all required California State and local licenses and certificates for performance of the Work, and shall furnish satisfactory proof of licensing and certifications to the Engineer upon request. All required licenses and certificates shall be valid throughout construction of the project.

**4.1.5 Taxes.** The Contractor shall pay all State, Federal, and local taxes applicable to the project, including all sales, use, gross receipts and similar taxes properly assessed against its equipment, materials, or property used or required in connection with the Work.

**4.1.6 Compensation for Employees.** In accordance with the provisions of Section 3700 of the Labor Code, the Contractor shall secure the payment of compensation to its employees, Subcontractors and Suppliers.

## **4.2 Supervision of the Work**

**4.2.1 Superintendent.** The Contractor shall provide a qualified, competent superintendent at the project site to supervise and direct all Work being performed by the Contractor, Subcontractors, and their respective agents and employees to ensure that the Work is being carried out in accordance with the Contract Documents. The Contractor shall designate, in writing, the scope and authority of the superintendent before the Work begins. Instructions and information given by the Engineer to the Contractor's superintendent about the Work are binding on the Contractor.

**4.2.2 Coordination of the Work.** Before starting each portion of the Work, the Contractor shall: (i) review and compare the various Contract Documents relative to that portion of the Work, as well as any additional information furnished by the Engineer and approved Subcontractor submittals that may affect proper installation of the Work; (ii) field measure existing conditions related to that portion of the Work; and (iii) observe any conditions at the site that may directly impact that portion of the Work, promptly reporting any improper or defective Work to the Engineer. Any errors or inconsistencies in the Contract Documents shall be promptly reported to the Engineer in writing as a request for information or clarification.

**4.2.3. Duty of Care.** All Work shall be performed in a workmanlike manner meeting construction industry standards for a similar project located in California, regardless of any omission from the Contract Documents.

## **4.3 Contractor's Employees**

**4.3.1** The Contractor shall employ competent qualified personnel to construct the Work and shall maintain discipline and order at the project site.

**4.3.2 Substitution of Key Personnel.** The Contractor cannot substitute key personnel, lessen their level of effort, or reduce the amount of time key personnel are assigned to the project without written consent from the Engineer. If the Contractor proposed specific key personnel during prequalification, or in response to an

invitation to bid, the Contractor shall provide the same personnel at the same level of effort and for the same duration and amounts of time per week.

**4.3.3 Removal of Personnel.** The Contractor shall not remove or replace any key personnel without the prior written consent of the Engineer, which will not be unreasonably withheld. When required by the Engineer, the Contractor shall remove from the project any person who, in the Engineer's opinion, is unfit, disorderly, dangerous, insubordinate, incompetent, or otherwise objectionable. Removed personnel may not be reemployed on the project without the Engineer's prior written consent. Such removal shall not be the basis of any claim for compensation or damages against the District or any of its officers, directors or employees. Within one week of removal, the Contractor shall propose a replacement to the Engineer. The replacement person shall hold the same position or title and have approximately the same number of years of experience or more as the person that was removed from the project.

**4.3.4** All personnel including sole proprietors performing electrical work covered by Division 26 of the contract documents shall be journeymen or registered apprentices or shall be certified as electricians pursuant to certification standards established by the Division of Labor Standards Enforcement. Personnel shall submit satisfactory proof of certification or registration to the Engineer prior to performing electrical work.

#### **4.4 Materials and Workmanship**

**4.4.1 Samples or Specimens.** The Contractor shall submit samples or prepare test specimens of such materials to be furnished or used in the work as the Engineer may require.

**4.4.2 Materials and Workmanship.** All materials and equipment incorporated into the Work shall be new, unexpired, of good quality, and of current manufacture unless otherwise specified. All materials shall be of the specified quality and equal to approved samples, if samples were required.

**4.4.3 Defective Work.** All materials furnished and all Work shall be satisfactory to the Engineer. In the event any goods or materials furnished, or services provided by the Contractor in the performance of the Contract fail to conform to the requirements, or to the samples submitted by the Contractor, the District may reject the same, and it shall be the duty of the Contractor to reclaim and remove the item promptly or to correct the performance of services, without expense to the District, and immediately replace all such rejected items with others conforming to the Contract. If Contractor refuses or neglects to replace such defective work, it may be replaced by the District at the expense of the Contractor, and its sureties shall be liable therefor.

- 4.4.4 Omissions.** All Work shall be completed in a thorough, workmanlike manner, notwithstanding any omission from the specifications or the drawings, and it shall be the duty of the Contractor to call attention to apparent errors or omissions and request instruction before proceeding with the Work. The Engineer may, by appropriate instructions, correct errors and supply omissions, which instructions shall be binding upon the Contractor as though contained in the original Contract Documents.
- 4.4.5 Substitution of Materials or Equipment.** Materials, products, services or equipment specified or designated in the Contract Documents are intended to indicate the measure of quality and utility. Unless the Contract Documents specifically state that there are no substitutions, the Contractor may submit other brands of the specified product provided that the submitted product is of equal or better quality, possesses the required characteristics for the purpose intended and shall not involve additional cost to the District. By proposing a substitute, the Contractor warrants that it is equal to that specified and takes complete responsibility for any errors, omissions, conflicts, all modifications to existing piping, ductwork or electrical connections, or inconsistencies caused by using the substitute, including any additional costs of engineering or inspection, or necessary coordination with connections to make the substitute perform as specified. All submittals shall receive written approval from the Engineer prior to installation.
- 4.4.6 Procurement and Storage.** All materials and equipment shall be furnished in ample quantities and procured in a timely manner to ensure uninterrupted progress of the Work. All materials and equipment shall be properly stored and protected and any loss or damage due to improper storage or protection shall be borne by the Contractor.
- 4.4.7 Site Logistics.** The Contractor shall maintain its storage area and shall keep its storage areas clean, safe and secure. Any materials or equipment stored offsite shall be insured. The risk of loss shall remain on the Contractor for all materials and equipment stored off-site.

#### **4.5 District's Right to Perform Separate Work**

- 4.5.1 Separate Work.** The District reserves the right to perform separate work at or near the project site at any time by the use of its own forces or other contractors. The Contractor shall coordinate its Work with the District and/or the District's other contractors and shall cooperate with the District to avoid any delay or hindrance to the project schedule and the other's work.
- 4.5.2 Delays and Defective Construction.** The District shall be reimbursed by the Contractor for costs incurred by the District that are payable to its separate contractors as a result of the Contractor caused delays, improperly timed activities, damaged work, or defective construction.

## **4.6 Patents and Copyrights**

**4.6.1** The Contractor shall pay all license fees and royalties and all other costs incidental to use in the Work of any patented or copyrighted design, process, or product. The Contractor shall indemnify and hold harmless the District, its officers, agents, and employees against all costs and claims arising from any infringement of patents or copyrights incidental to use in the Work of any design, process, or product not specified in the Contract Documents.

## **4.7 Contractor's Responsibility for Losses and Liabilities**

**4.7.1 Risk of Loss.** Until acceptance of the Work by the District, the Contractor bears all risk of loss or damage to the Work or to any part of the Work and to any materials or equipment ordered or purchased for the Work whether located at the project, suitably stored off-site or in transit regardless of the cause of loss or damage. The Contractor shall sustain all losses arising from unforeseen obstructions or difficulties, either natural or artificial, encountered in the prosecution of the Work, or from any action of the elements prior to final acceptance of the Work, or from an act or omission on the part of the Contractor not authorized by the Contract Documents.

### **4.7.2 Protection of Materials and Facilities**

- .1** The Contractor is responsible for the preservation, protection and care of equipment, materials and facilities whether located on the project site or elsewhere and if it does not do so, the District may, at its option, do so at the Contractor's expense.
- .2** The Contractor is responsible for any District-furnished material upon receipt and for protection of the Work until it is completed and accepted. The Contractor shall at its own expense replace damaged or lost material and repair damaged parts of the Work.
- .3** The Contractor shall protect District facilities from damage resulting from its Work. District facilities damaged by or as a result of the Contractor's Work shall be repaired or replaced, at the Contractor's expense.
- .4** The Contractor shall maintain the project site in a clean, safe and orderly condition. Upon completion of the Work, the Contractor shall remove all temporary buildings and structures, rubbish, debris, abrasive blast media, unused material, concrete forms, and other materials used during construction that are not part of the completed work.
- .5** The Contractor shall provide fire watch and be responsible for all fire prevention in connection with the Work. Open fires will not be permitted on the project site. The Contractor shall notify the Engineer before undertaking any

torch cutting and welding operations. The Contractor shall take all necessary safety precautions during torch cutting and welding operations including, but not limited to, fire watch, providing fire extinguishers and fire blankets at the location where the operations are occurring. The Contractor shall be responsible for any damages caused by the Contractor or Subcontractor during such operations.

#### **4.7.3 Laws and Regulations**

- .1 The Contractor, its agents and employees shall observe and comply with all Federal, State, Municipal and local laws, ordinances, rules, regulations, building codes and standards, orders, notices and requirements applicable to its Work on this project. Nothing in these Contract Documents may be construed to permit Work not conforming to such laws, ordinances, and regulations. If the Contractor should discover any aspect or portion of the Contract Documents that conflicts with any law, ordinance, regulation, order, or decree, the Contractor shall immediately report the conflict in writing to the Engineer. Where the applicable legal requirements of public authorities differ from those of the Contract Documents, the more stringent requirements shall apply.
- .2 If an applicable law requirement was not in effect on the date of submission of bids, the Contract Sum and the Contract Time will be adjusted, if necessary, as provided in Article 7. Under no other circumstance will the Contract Sum or Contract Time be adjusted because of the effect of any applicable law, ordinance, regulation, order, decree or other legal requirement of public authorities in effect on the date of bid submission.

**4.7.4 Duty to Defend.** Notwithstanding assertions that the District, the Board, any member of the Board, or the District's officers, agents, or employees may have been actively or solely negligent, the Contractor shall assume the defense of the District, the Board, each member of the Board, and the District's officers, agents, and employees from all claims of any kind arising directly or indirectly out of the performance of, or on account of, the Work.

#### **4.7.5 Indemnity**

- .1 To the fullest extent allowed by law (including, but not limited to, Civil Code Section 2782), the Contractor shall indemnify and save harmless the District, the Board, each member of the Board, and the District's officers, agents, and employees (collectively "Indemnitees") from all liability, claims, damage and loss, of any kind, including attorneys' fees, subject to the limitations set forth by law, that arise out of, on account of, or in connection with the performance of the Work, including, but not limited to, liability or claims arising out of or resulting from:

- a) Any act or omission of the Contractor, its Subcontractors and Suppliers, or anyone directly employed by any of them for whom the Contractor may be liable, during the performance of the Work; in guarding or maintaining the Work; or from any improper materials, implement, or appliances used in construction of the Work;
  - b) Violation of any law, ordinance, regulation, order, or decree, whether by the Contractor, its Subcontractors, Suppliers or anyone directly employed by any of them for whom the Contractor may be liable;
  - c) The use or manufacture by the Contractor, its agents, or the District of any copyrighted composition, secret process, patented invention, article, or appliance, unless specifically specified in the Contract Documents;
  - d) Any breach of warranties, whether express or implied, made to the District by the Contractor, its Subcontractors, Suppliers or anyone directly employed by any of them for whom the Contractor may be liable;
  - e) The willful misconduct of the Contractor, its Subcontractors, Suppliers or anyone directly employed by any of them for whom the Contractor may be liable;
  - f) Any breach or default of the obligations assumed by the Contractor under this contract;
  - g) Injuries, sickness, disease or death of employees of the Contractor or its Subcontractors, Suppliers or anyone directly employed by any of them for whom the Contractor may be liable in connection with performance of the Work; and
  - h) Destruction of tangible property (other than the Work itself).
- .2 The Contractor's duty to indemnify is not affected or in any way diminished because the District, the Board, any member of the Board, or the District's officers, agents, or employees jointly caused or contributed to the liability or claim by their acts, omissions, conduct, or negligence, except that the Contractor is not obligated to indemnify an Indemnatee against its sole or active negligence, willful misconduct, or for defects in designs furnished by the Indemnatee. The Contractor's indemnification obligation is not limited by the Contractor's insurance, if any, or by the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor or other person or organization under the Workers' Compensation Act, Disability Benefit Act, or other employee benefit act. Said duty to indemnify shall not apply to the District's active negligence, consistent with Civil Code Section 2782.

## **4.8 Protection of Property**

- 4.8.1** The Contractor shall take all necessary precautions to provide for the safety and protection of all persons who may come in contact with the Work and for all property within and adjacent to the project site including, but not limited to, adequate precautions to protect existing sidewalks, curbs, pavements, utilities, shrubs, trees, and other adjoining property and structures. Should any facility, structure, or property be damaged by the operations of the Contractor, the Contractor shall immediately notify the proper owners or authorities and the Engineer. The precautionary measures shall apply continuously and not be limited to normal work hours.
- 4.8.2** If damage to persons or property occur as a result of the Work, the Contractor shall be responsible for proper investigation, documentation, including video or photography, to adequately memorialize and make a record of what transpired. The Contractor, at its own expense, shall rebuild, repair and restore, to the Engineer's satisfaction, all damage resulting from its operations as a condition of contract acceptance.
- 4.8.3** Pursuant to Public Contract Code, Section 9201, the District will provide timely notification to the Contractor of the receipt of any third-party claims relating to damaged property.

## **4.9 Contractor Use of Premises**

- 4.9.1** The Contractor shall confine operations at the project site to areas permitted by the Contract Documents and shall not encumber the site with excessive material or equipment. The Contractor shall not impose load on any structure that will damage or endanger the structure. The Contractor shall take all actions necessary to prevent annoyance to occupants adjacent to or in the vicinity of the Work and shall not hinder access or operations of District personnel or equipment.

## **4.10 Documents On-site**

- 4.10.1 Contract Documents.** The Contractor shall maintain a copy of all Contract Documents at the project site, including but not limited to, subcontracts; Change Orders; requests for information; site, health and safety plan; material safety data sheets; the current construction progress schedule; updated as-built drawings; all approved submittals and samples pertaining to the Work; and any governing authority required documents. The Engineer shall have access to the Contract Documents during the Contractor's normal business hours.

## **4.11 Review of Contract Documents and Field Conditions**

- 4.11.1** The Contractor shall carefully study and compare the Contract Documents for any errors, omissions, or discrepancies; and shall take field measurements and carefully



compare such field measurements with the Contract Documents. The Contractor shall immediately inform the Engineer in writing of any apparent errors, omissions, or discrepancies and shall await instructions before proceeding with the Work. Instructions given by the Engineer, which are manifestly necessary to carry out the intent of the Contract Documents or which are customarily performed, shall be performed by the Contractor as if fully and correctly set forth in the Contract Documents at no additional cost to the District.

- 4.11.2** If the Contractor performs any construction activity that it either knows or should have known involves an error, omission, or discrepancy referred to in Article 4.11.1 without notifying and receiving written instructions from the Engineer, the Contractor shall be responsible for resultant losses, including without limitation, the costs and time of correcting the defective Work.
- 4.11.3** Drawings indicate general and typical details of construction. Where conditions are not specifically indicated but are of similar character to details shown, similar details for construction shall be used, subject to review by the Engineer.

## **ARTICLE 5 – SUBCONTRACTORS AND SUPPLIERS**

- 5.1.1** The Contractor is fully responsible to the District for the acts and omissions of Subcontractors, Suppliers, and of persons and/or persons or entities employed by the Contractor to the same extent the Contractor is responsible for its own acts and omissions.
- 5.1.2** All Subcontractors shall possess the appropriate California State contractor's license and certifications at time of bid and during the performance of the Work. The Contractor shall comply with all requirements of the Subletting and Subcontracting Fair Practices Act commencing with Public Contract Code, Section 4100, et seq. Violation of the Subletting and Subcontracting Fair Practice Act are grounds for cancellation of the Contract under Public Contract Code, Section 4110, and disciplinary actions under Section 4111.
- 5.1.3** The Contractor shall coordinate all Subcontractors and Suppliers engaged in the Work. The Contractor shall ensure that all of its Subcontractors commence their respective work at the proper time and proceed with due diligence to avoid delays and/or damage to the Work. Any property damage caused by Subcontractors or Suppliers during the Work shall be repaired or paid for by the Contractor.
- 5.1.4** Nothing contained in the Contract Documents shall be construed as creating any contractual relationship between any Subcontractor, or Supplier, and the District. The District will not undertake to settle differences between the Contractor and its Subcontractors or Suppliers.

## ARTICLE 6 - SAFETY OF PERSONS AND PROPERTY

### 6.1 Contractor's Responsibility

- 6.1.1** Notwithstanding any other provision of the specifications, the Contractor is solely and completely responsible for conditions of the jobsite, including safety of all persons and property, during performance of the Work. This requirement applies continuously and is not limited to normal work hours. Health and safety provisions shall conform to any specific safety requirements contained in the Contract Documents, applicable Federal, State, County, and local laws, regulations, ordinances, standards, and codes, including the Federal Occupational Safety and Health Act of 1970 (29 U.S.C., Section 651, et seq.) and California Code of Regulations, Title 8, Industrial Relations Division 1, Department of Industrial Relations, Chapter 4. Where any of these are in conflict, the more stringent requirement shall be followed.
- 6.1.2** Contractor shall take any additional precautions the District may reasonably require for safety and accident prevention purposes. Any violation of such rules and requirements, unless promptly corrected, shall be grounds for termination of the Contract or Contractor's right to proceed in accordance with the default provisions of the Contract Documents.

### 6.2 Public Safety

- 6.2.1** During the performance of the Work, the Contractor shall erect and maintain necessary temporary fences, bridges, railings, lights, signals, barriers, or other safeguards as appropriate under the circumstance for the prevention of accidents. In addition, the Contractor shall take other precautions as necessary for public safety including, but not limited to, traffic control.

### 6.3 Engineer's Responsibility

- 6.3.1** The Engineer's review of the Contractor's construction performance and submittal documents is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.
- 6.3.2** The Engineer may suspend operations if it determines that an imminent safety hazard exists.

### 6.4 Emergency Work

- 6.4.1 During Work Hours.** The Contractor shall act, without previous direction from the Engineer in case of an emergency arising from the performance of the Work that threatens loss or injury to property and/or safety of life. The Contractor shall notify the Engineer of the emergency as soon as possible. Any compensation claimed by the Contractor, together with substantiated documents in regard to

expense, shall be submitted to the Engineer within 15 calendar days after the emergency. Additional compensation, if allowed, will be paid for through Article 7.

**6.4.2 Outside of Work Hours.** The Engineer will notify the Contractor of all emergencies for which it is aware that arise outside of regular work hours as a result of the Work. The Contractor shall respond to the emergency immediately without delay and shall, with the least practicable inconvenience, make the necessary repairs, replacements, or perform other necessary work. If the Contractor does not act promptly in accordance with this requirement, or should the circumstances of the case require repairs, replacements, or performance of other necessary work before the Contractor can be notified or can respond, the District may, at its option, make the necessary repairs, replacements, or perform the necessary work and deduct its cost of labor, materials and equipment from the Contractor's next progress payment. Performance of emergency work by District forces will not relieve the Contractor of any of its responsibilities, obligations, or liabilities under the contract.

## **ARTICLE 7 - CHANGES**

### **7.1 General**

The District reserves the right to make changes in the design of materials, equipment, or machinery; to make alterations or additions to, or deviations or subtractions from the Contract and any specifications and drawings; to increase or decrease the required quantity of any item or portion of the Work; to omit any item or portion of the Work as may be deemed by the Engineer to be necessary or advisable; and to order such extra work as may be determined by the Engineer to be required for the proper execution and completion of the whole Work contemplated. No change in the scope of work shall be authorized, and the Contractor shall not be eligible for compensation for any extra work performed, unless the change is ordered by the Engineer in writing.

### **7.2 Change Orders**

**7.2.1** Changes in the Work can only be made through a written contract Change Order issued by the Engineer. If the change causes an increase or decrease in the Contractor's Contract Sum, or a change in the Contract Time, an adjustment may be made as determined by the Engineer. The approved Change Order will specify increase or decrease to the Contract Sum and adjustment to the Contract Time, if any.

**7.2.2** Prior to issuing an approved Change Order, the Engineer may request that the Contractor submit a proposal covering the changes. The Change Order request will include a description of the work or revised drawings or specifications reflecting the proposed changes. Within 10 Work Days after receiving the request, the Contractor

shall submit its proposal to the Engineer of all costs associated with the proposed change and any request for an extension of Contract Time. Contractor's proposal shall include detailed estimates with cost breakdowns for each Subcontractor, including labor, material, equipment, overhead, and profit. Labor shall be broken down into hours and rate per hour. If applicable, the proposal shall include a breakdown for off-site labor (including factory labor, engineering, etc.). The Contractor's proposal shall include an Analysis of Schedule Impact (See Article 3.4.2.3) when the Contractor is requesting an adjustment in Contract Time. Costs associated with preparation of the proposal, including the Analysis of Schedule Impact, are considered to be covered in the markup allowances in Article 7.3.4. The Contractor shall be responsible for any delay associated with its failure to submit its change proposal within the time specified. If the Engineer decides not to issue an approved Change Order after requesting a proposal from the Contractor, the Contractor will be notified in writing. The Contractor is not entitled to reimbursement for Change Order preparation costs for cancelled Change Order requests.

**7.2.3** If the Contractor agrees with the terms and conditions of the approved Change Order, the Contractor shall indicate its acceptance by signing the original copy and returning it to the Engineer within 10 Work Days after receipt or with reasonable promptness and in such sequence as to not delay the Work or activities of the District or of separate contractors, whichever is sooner. If notice of any change is required to be given to a surety by the provisions of any bond, the Contractor shall provide notice and the amount of each applicable bond shall be adjusted separately. Payment in accordance with the terms and conditions set forth in the executed Change Order shall constitute full compensation for all Work included in the Change Order and the District will be released from any and all claims for direct, indirect, and impact expenses and additional time impact resulting from the Work. If the Contractor disagrees with the terms and conditions of the approved Change Order, the Contractor shall indicate specific areas of disagreement and return the approved Change Order to the Engineer. The Contractor shall submit a written dispute in accordance with Article 3.4. No payment will be made on the disputed work until the approved Change Order is returned to the Engineer. However, whether or not the Contractor agrees with the terms and conditions of an approved Change Order, the Contractor shall immediately revise its sequence of operations as required to facilitate timely completion of the changed work and shall proceed with the revised work sequence.

**7.2.4** The Engineer may, after having received a written cost quotation from the Contractor, order the Contractor, in writing, to proceed with the work prior to issuance of an approved Change Order through a change directive. The change directive will authorize the Contractor to proceed with the work subject to the cost quotation submitted by the Contractor. Within five days following receipt of the change directive, the Contractor shall submit a detailed change proposal as described in Article 7.2.2 documenting the amount of compensation. The Engineer will review the change proposal and, at its option, will either issue an approved Change Order

for the work or direct the Contractor to perform the work through Force Account. Until the method of compensation is determined and the approved Change Order is received, the Contractor shall keep full and complete time and material records of the cost of the ordered work and shall permit the Engineer to have access to such records. An approved Change Order shall supersede any previously issued written change directive covering the same Work.

- 7.2.5 Accord and Satisfaction and Reservations of Rights:** Every executed Change Order shall constitute a full accord and satisfaction, and release of all Contractor (and, if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay, and any other type of claim.

### **7.3 Determination of Costs for Force Account Change Order Work**

- 7.3.1 Labor.** The cost of labor used in performing the Change Order work, whether the employer is the Contractor and/or its Subcontractor, shall be the sum of the following:

- .1 Actual Wages:** Actual wages paid to workers, including foremen devoting their exclusive attention to the work in question. The actual wages shall include payments to, or on behalf of, workers for health and welfare, pension, vacation, travel, subsistence, and similar purposes, and shall be paid at the wage rate demonstrated by submitted certified payrolls or, if the certified payrolls were not available, at the rate set forth in the pertinent prevailing wage determinations issued by the Director of Industrial Relations for the wage class common to the work performed. Superintendent's wages are included under the allowance for overhead and profit and shall not be included as part of these computations.
- .2 Labor Surcharge:** To the actual wages, as defined in Article 7.3.1.1 above less those for travel and subsistence, will be added 27 percent, which shall constitute full compensation for all payments imposed by State and Federal laws, such as taxes, and for insurance and all other payments made to, or on behalf of, the workers, other than actual wages as defined in Article 7.3.1.1 above.

- 7.3.2 Materials.** Only materials incorporated in the Change Order work will be paid for, the cost of which shall be the cost to the purchaser, including sales tax, if applicable, whether the Contractor and/or its Subcontractor, from the Supplier thereof, except as the following are applicable:

- .1** If a cash or trade discount by the actual Supplier is offered or available to the purchaser, it shall be credited to the District notwithstanding the fact that such discount may not have been taken.

- .2 If materials are procured by the purchaser by any method which is not a direct purchase from a direct billing by the actual Supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual Supplier as determined by the Engineer. No markup except for actual costs incurred in the handling of such materials will be permitted, and only application of one common markup to cover multiple handling.
- .3 If the materials are obtained from a supply or source owned wholly or in part by the purchaser, payment therefor will not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or the current wholesale price for such materials delivered on the job site, whichever price is lower.
- .4 If the cost of such materials is excessive in the opinion of the Engineer, then the cost of such materials shall be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned and timely delivered to the job site, less any discounts as provided in Article 7.3.2.1 above.

**7.3.3 Equipment.** The Contractor and/or its Subcontractor will be paid for the use of equipment at the rental rates established as provided in Articles 7.3.3.1 and 7.3.3.2 below, which rates shall include the cost of fuel oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Operators of rented equipment will be paid for as provided in Article 7.3.1 above.

Unless otherwise specified, manufacturers' ratings shall be used to classify equipment for the determination of applicable rental rates.

- .1 Equipment on the Work:** For the use of any equipment normally required for the contract regardless of whether the equipment is already on the work or is to be delivered to the project, the Contractor and/or its Subcontractor will be paid for the use of such equipment as follows:
  - a) If equipment is owned by the Contractor and/or its Subcontractor, payment will be at the rental rates listed for such equipment in the State of California's Department of Transportation publication titled "Labor Surcharge and Equipment Rental Rates" that is in effect on the date that the Work is performed. The rental rates for equipment not listed under the schedules of rental rates set forth by the State of California shall be those agreed upon by the Contractor and/or its Subcontractor, and the Engineer, except that in no case shall the rental rates exceed those of established distributors or equipment rental agencies within the locality of the project. The Contractor and/or its Subcontractor shall provide full documentation to the satisfaction of the Engineer to support any proposed equipment rental rates. Documentation shall include a breakdown of costs per Article 7.3.3, including amortized depreciation versus wear and tear, and

maintenance expenses versus operating expenses.

Compensation for idle time of equipment through delays caused by the District will be made by applying the delay factor listed in the Caltrans User's Guide for Labor Surcharge and Equipment Rental Rates (current version), or if unlisted at 50 percent of the rental rates listed in the State of California Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates." Compensation for idle time shall not exceed eight (8) hours per day and forty (40) hours per week.

- b) If equipment is rented, payment will be the actual rental cost as indicated on the rental invoice.

Individual pieces of equipment or tools not listed and having a replacement value of \$1,000 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made for their use on the Work.

In computing the rental of equipment, the minimum rental time to be paid per day shall be one hour. Rental time shall not be allowed while equipment is inoperative due to breakdowns or non-Work Days. Loading and transporting costs shall be allowed when the equipment is moved by means other than its own power.

- .2 Equipment for Change Order Work:** For the use of equipment not required under the Contract Documents, moved on the Work and used exclusively for Change Order work, the Contractor will be paid at the rates agreed upon by the Contractor and/or Subcontractor, and the Engineer through the Change Order process, except that in no case shall the rental rates paid exceed those of established distributors or equipment rental agencies.

The rental period shall begin at the time the equipment is required and unloaded at the site and shall terminate on the day that the Change Order work is completed, except that the minimum total rental time to be paid for shall be not less than four hours.

The Contractor and/or its Subcontractor will be reimbursed for the cost of transporting the equipment to and from the Work. Should the equipment be transported by low bed trailers, hourly rates charged by established haulers will be paid. Also, the District will pay for loading and unloading costs. Should the Contractor and/or its Subcontractor desire the return of the equipment to a location other than its original location, the District will pay the cost of transportation in accordance with the above provisions, provided such cost does not exceed the cost of moving the equipment to the project.

**7.3.4 Markup Allowances.** The Contractor and/or its Subcontractors or Suppliers that perform on-site work are entitled to compensation for overhead and profit for the performance of Change Order work. This compensation shall be in the form of markup percentages applied to the costs computed as provided for in Articles 7.3.1 through 7.3.3 and is full and complete payment for overhead and profit. Overhead includes, but is not limited to, superintendent costs, bond and insurance premiums, financing costs, project engineer, project manager, scheduler, estimator, drafting, small tools, home office expenses, field office expenses, and utilities (gas, electricity, sewer, water, telephone, fax, copier, etc.). The Contractor shall not receive payment for itemized costs which are considered to be included under the profit and overhead percentage markup.

.1 For work by the Contractor's own organization or by its Subcontractor's own workforce, the Contractor may apply, as a maximum, the following markup percentages as overhead and profit:

1. Labor	20 percent
2. Materials	15 percent
3. Equipment (owned or rented)	15 percent

.2 Under a fixed price adjustment basis, if work is performed by a Subcontractor with its own workforce, the Contractor may apply an additional 5 percent markup to the total which has been computed in accordance with Article 7.3.4.1. The Contractor shall reach agreement with the Subcontractor and any intermediate Subcontractor as to the division of the markup percentages between them.

.3 Under a force account basis, if work is performed by a Subcontractor with its own workforce, the Contractor may not apply an additional 5 percent markup, as provided for under Article 7.3.4.2, to the total which has been computed in accordance with Article 7.3.4.1. The Contractor shall reach agreement with the Subcontractor and any intermediate Subcontractor as to the division of the markup percentages between them.

#### **7.4 Lump Sum or Force Account Adjustments**

**7.4.1** Change Order work will be paid for by either a Lump Sum adjustment of the Contract Sum or on a Force Account basis, or a combination of both, as determined by the Engineer. Change Order work will not be paid for unless ordered in writing by the Engineer.

**7.4.2** In the event the Contractor fails to submit its proposal within 15 days after receipt of a written request for proposal, or the Engineer and the Contractor fail to agree upon a negotiated Lump Sum adjustment, within a reasonable time, or if in the judgement of the Engineer, it is impracticable because of the nature of the Work or



for any other reason to fix the price for completion before the work order is issued, the Engineer has the option of authorizing payment on the basis of a Force Account.

- 7.4.3** The Contractor shall notify the Engineer in writing of the day and time on which Force Account work will commence prior to beginning work. All Force Account work shall be reported daily on daily extra work reports furnished by the Engineer to the Contractor and signed by both parties, which daily reports shall thereafter be considered the true record of Force Account work completed. Completely detailed invoices covering the Force Account work shall be submitted for payment consideration not later than 15 days after the completion of the work. The charges for Work performed by the Contractor or a Subcontractor shall be reported separately. Substantiating invoices from Suppliers and Subcontractors shall be included with the Contractor's invoices. The Contractor shall permit examination of accounts, bills, and vouchers relating to the Force Account work when requested by the Engineer. Payment for the Work done under Force Account will be made after receipt of an executed Change Order issued to cover the increase in the Contract Sum.
- 7.4.4** Payment for the Work completed under Lump Sum adjustment will be made after receipt of an executed Change Order issued to cover the change in the Contract Sum and/or Contract Time.

## **7.5 Variation in Quantity in Unit Price Work**

**7.5.1 General.** The estimated quantities for Unit Price work listed in the Bid Form are established for the sole purpose of bid comparison and do not constitute a guarantee to the Contractor of the quantities of work to be performed under this contract. The Contractor shall be compensated only for the actual quantities of work performed which were directed by the Engineer. The amount of compensation for each item of Work shall be computed by multiplying the actual quantity by the appropriate bid Unit Price except as follows:

- .1 Increases of more than 20 percent:** If the actual quantity of work performed on an item of Work exceeds the estimated quantity by more than 20 percent, the quantity in excess of 120 percent of the estimated quantity shall be paid for based upon (a) actual unit cost or (b) as mutually agreed to by the Contractor and the Engineer. The Engineer will determine which method is to be utilized. If the actual unit cost method is utilized, the actual unit cost is determined by calculating the total cost incurred for completing 120 percent of the estimated quantity using the markups allowed under Article 7.3.4, which is then divided by the quantity of work performed, i.e., 120 percent of the estimated quantity. If costs applicable to the Work performed include fixed costs, such fixed costs shall be deemed to have been recovered by the Contractor by the payments made to the Contractor for 120 percent of the estimated quantity at the bid Unit Price. In computing the actual unit cost, such fixed costs shall be excluded.

At the discretion of the Engineer, the Engineer can make payment on the quantity in excess of 120 percent of the estimated quantity using exactly the provisions and procedures in the “Force Account” Articles 7.3 and 7.4.3.

- .2 Decreases of more than 20 percent:** If the actual quantity of work performed on an item of Work is less than 80 percent of the estimated quantity, the quantity shall be paid for (a) based upon actual cost using the markups allowed under Article 7.3.4, or (b) as mutually agreed to by the Contractor and the Engineer.

Payment for the actual quantity of work performed shall, in no case, exceed the payment which would have been made for performance of 80 percent of the estimated quantity at the bid Unit Price.

## **7.6 Deleted Work**

- 7.6.1 Deleted Work.** If work is deleted, payment will be made to the Contractor for costs incurred in connection with the deleted work if incurred prior to notification of deletion by the Engineer.

If approved material is ordered by the Contractor for the deleted work prior to the notification by the Engineer, and if orders for such materials cannot be canceled, payment for such material will be the actual cost to the Contractor. In such case, the material shall become the property of the District. If the material can be returned to the vendor, and if the Engineer so directs, the material shall be returned and the Contractor will be paid for the actual costs or charges made by the vendor for returning the material including any stocking charges.

The costs incurred or charges paid to the Contractor for Work completed prior to deletion shall be computed using the markups allowed in Article 7.3.4. Payment for deleted work will be based on the approved schedule of costs or other mutually agreed value. A minimum of a 10 percent credit shall be provided to the District for overhead, profit and markup associated with the deleted work.

## **7.7 Differing or Unusual Site Conditions**

- 7.7.1** Pursuant to Public Contract Code, Section 7104, the Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of: (1) material that the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code (other than material indicated in the Contract Documents) and that is required by law to be removed to a Class I, Class II, or Class III disposal site; (2) subsurface or latent physical conditions at the site differing materially from those indicated in this contract; or (3) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract.

- 7.7.2 The Engineer will promptly investigate the conditions. If the Engineer finds that the conditions do materially differ, or do involve hazardous waste, and do cause an increase or decrease in the Contractor's Contract Sum and/or the Contract Time a contract adjustment will be made through the Change Order process, as determined by the Engineer.
- 7.7.3 If the Contractor and the Engineer disagree whether the conditions do materially differ or whether a hazardous waste is involved or whether the conditions cause an increase or decrease in the Contractor's Contract Sum and/or Contract Time, the Contractor shall nevertheless proceed with all Work to be performed under the contract and shall comply with the completion dates required by the contract. The Contractor waives any rights to an increase in Contract Time, or an increase in Contract Sum, unless it timely follows the Disputes and Claims procedures in Article 3.4.

## ARTICLE 8 - TIME

### 8.1 Commencement, Prosecution, and Completion of Work

- 8.1.1 **Notice to Proceed.** The Notice to Proceed will not be issued until the contract is properly executed, bonds are furnished, proof of insurance submitted by the Contractor, and both the bonds and the insurance are approved by the District. The Contract Time will not be extended, and the Contractor will not receive any additional compensation, because of delays caused by receipt, review and approval by the District of the Contractor's bonds and insurance. Except as required elsewhere, the Contractor is not authorized to perform any Work under this contract until it has received an official Notice to Proceed.
- 8.1.2 **Prosecution of the Work.** Work shall proceed at all times with such force and equipment as will be sufficient to complete the Work within the Contract Time.
- 8.1.3 **Required Contract Completion.** The Contractor expressly agrees that it will complete the Work within the Contract Time, subject to approved Change Orders that impact time.
- 8.1.5 **Early Completion.** The Contractor shall not be entitled to claim damages for expenses due to the District not authorizing early completion.

### 8.2 Liquidated Damages

- 8.2.1 Should the Contractor fail to complete all or any portion of the Work within the specified time therefor or within such extra time as may be allowed for delays by formal extensions granted by the District, deductions will be made from the Contractor's earnings for the time that the Work remains incomplete beyond the

specified completion time. Liquidated damages will be apportioned such that the Contractor will be responsible for all delays not otherwise properly subject to time extensions.

- 8.2.2** Liquidated damages cover only certain damages and are limited to the cost of administration, overhead, and general loss of use of the facility by the District as a result of a delay, and does not cover any other type of damages set forth in Section 8.2.3. It being impracticable or extremely difficult to fix the actual amount of damage for the above-referenced categories of damages, the parties agree that the amounts set forth in this Contract as liquidated damages will be deducted from any money due the Contractor under the contract. Should the amount of the damages exceed the amount due the Contractor, the Contractor and its sureties shall be liable for the excess.
- 8.2.3** Liquidated damages shall not be deemed to include within their scope additional damages or administrative costs arising from defective work, lost revenues, interest expenses, cost of completion of the Work, cost of substitute facilities, claims and fines of regulatory agencies, damages suffered by others or other forms of liability claimed against the District as a result of delay (e.g., delay or delay-related claims of other contractors, Subcontractors or tenants), and defense cost thereof. The Contractor shall be fully responsible for the actual amount of any such damages it causes, in addition to the liquidated damages otherwise due the District.
- 8.2.4** At the District's option, the deduction for liquidated damages will begin with the first progress payment following the incurrence of liquidated damages.
- 8.2.5** The above liquidated damages are necessary to ensure timely completion and to defray costs of additional construction inspection and contract administration.

### **8.3 Use of Facilities Prior to Completion of Contract**

- 8.3.1** If the Contractor has received and provided to the District a temporary certificate of occupancy from governmental authorities having jurisdiction over the project and/or in the Engineer's opinion, the Work under the contract, or any portion of the Work, is in a condition suitable for the District's use, the District may, after written notice from the Engineer to the Contractor, use (which includes, but is not limited to, taking over or placing into service) any portion or portions of the project designated by the Engineer.
- 8.3.2** Even if the District elects to use the Work or a portion of the Work prior to Contract Completion, the Contractor will nonetheless make all necessary repairs, renewals, changes, or modifications in the Work or any portion of the Work that does not meet the requirements of the Contract Documents or is deficient due to defective materials or workmanship, unless the deficiency is solely caused by ordinary wear and tear.

**8.3.3** The use of any portion of the Work by the District does not relieve the Contractor of any of its responsibilities or liabilities under the Contract Documents or constitute a waiver by the District of any claims. Said use shall not cancel liquidated damages as of the first date of use, or any continuance thereof, nor impair, reduce, or change the amount of liquidated damages.

#### **8.4 Delays and Extensions of Time**

**8.4.1** The Contractor shall take reasonable precautions to foresee and prevent delays to the Work including, but not limited to, maintaining construction schedules that are properly updated to reflect current conditions and the actual critical path, and continuous monitoring of critical and dependent activities of the Contractor, Subcontractors, Suppliers, the District, agencies and other third parties. When the Contractor foresees a delay event, and in any event upon the occurrence of a delay event, the Contractor shall immediately notify the Engineer in writing of the probability or the actual occurrence of a delay in the Contract Time, and its cause. With respect to all delays (compensable, excusable and/or inexcusable), the Contractor shall reschedule its Work and/or revise its operations, to the extent possible under the terms of the contract, to mitigate the effects of the delay through work-arounds, overtime and acceleration of the project schedule, re-sequencing the Work, or other methods commonly utilized in the construction industry.

**8.4.2** For Inexcusable Delay (as defined in Article 1.2.1.25), the Contractor shall not be entitled to an extension of time or compensation for any loss, cost, damage, expense or liability resulting directly or indirectly from the Inexcusable Delay including, but not limited to, extended field or home office overhead, field supervision, cost of capital, interest, escalation charges, labor costs, materials expense, or acceleration costs.

**8.4.3** For Excusable Delay (as defined in Article 1.2.1.19), the Engineer will grant the Contractor an extension of time in an amount equal to the period of Excusable Delay based on the analysis of schedule impact and delay analysis diagram, which shall be the Contractor's sole and exclusive remedy for such delay. Excusable Delays shall include labor strikes, adverse weather as defined in Article 8.5, and Acts of God.

**8.4.4** For Compensable Delay (as defined in Article 1.2.1.7), the Engineer will grant the Contractor an extension of Contract Time with compensation in an amount that represents the Contractor's actual direct costs incurred as a direct result of the Compensable Delay. The Contractor may recover its direct costs only and may not recover (and waives) all other types of indirect, consequential, special and incidental damages.

- 8.4.5** For Concurrent Delay (as defined in Article 1.2.1.8), the following rules apply: if one or more of the Concurrent Delays are excusable or compensable, then the District will treat the period of Concurrent Delay as an Excusable Delay; and if all of the Concurrent Delays are inexcusable, then the District will treat the Concurrent Delay as inexcusable. These rules for Concurrent Delay shall be the Contractor's sole and exclusive remedy for periods of Concurrent Delay, and the Contractor's entitlement shall be limited to the measures of recovery defined herein for Inexcusable, Excusable and Compensable Delay, as applicable.
- 8.4.6** No time extension will be granted to the Contractor for encountering delays while performing Work after the specified or formally extended Contract Completion date, except for causes of delay specified in Article 8.4.4.
- 8.4.7** The Contractor shall provide notice and documentation of delays in accordance with the following rules:
- .1** Within five days of knowing about an event that may cause a delay in the project schedule, the Contractor shall notify the Engineer in writing about the delay in the Work, the impact it may have on the project schedule, and the causes of the delay. The Contractor's notice shall set forth the anticipated impact of the delay on the critical path, specify any additional time requested, and provide a detailed description of the cause or causes of the delays.
  - .2** If the Contractor intends to request an extension of time or compensation for damages resulting from delay, then the Contractor shall make the request in writing to the Engineer not more than 15 days after the end of such delay. If any delay exceeds 30 days, however, then the request shall be made monthly and then updated every month after that (as applicable). The Contractor shall provide an Analysis of Schedule Impact of the delay (see Article 3.4.2.3 and 3.4.2.4) and update it monthly (as applicable). The Contractor shall also provide documentation showing that the delay was either excusable or compensable and that the Contractor has revised its construction schedule, to the extent possible, to mitigate the delay. No compensation for damages resulting from delay will be granted unless supported by cost records justifying the costs claimed in connection with the delay.
- 8.4.8** The Contractor's failure to give written notice of a delay or to submit or document a request for an extension of time or for damages resulting from delay in the manner and within the times stated above shall constitute a waiver of all rights thereto.
- 8.4.9** An extension in Contract Time must be approved by the Engineer to be effective. An extension of Contract Time with or without consent of the sureties, shall not release the sureties from their obligations, which shall remain in full force until the discharge of the contract.

**8.4.10** The Engineer will investigate the facts and ascertain the extent of the delay, and issue a written statement regarding its findings. If the Contractor disagrees with any decision of the Engineer regarding delays and extensions in Contract Time, the Contractor may dispute the Engineer's decision in accordance with Article 3.4.

## **8.5 Weather Conditions Unfavorable for Prosecution of Work**

**8.5.1** The Engineer may suspend the Work whenever weather conditions or conditions resulting from inclement weather are unfavorable for the prosecution of the Work. The delay caused by such suspension may entitle the Contractor to an extension in Contract Time, but not to any other compensation.

**8.5.2** If the Contractor believes that the Work should be suspended under this Article, the Contractor may request such suspension. The delay caused by the suspension may entitle the Contractor to an extension of Contract Time, but not to any other compensation. The Contractor's request for suspension must be agreed to by the Engineer in order to be granted an extension of Contract Time.

**8.5.3** No extension of time will be granted for suspension of Work unless the suspension impacts the Contract Completion date or the timely completion of a milestone completion date for a portion of the Work. Determination that suspension of the Work for inclement weather conditions or conditions resulting from inclement weather impacts timely completion and entitles the Contractor to an extension of Contract Time shall be made and agreed to in writing by the Engineer and the Contractor for each day that work is suspended. In the event of failure to agree, the Contractor may protest under the provisions of Article 3.4.

**8.5.4** If the Work is suspended and an extension of Contract Time is granted under this Article, the Contractor will be entitled to a one Work Day extension of time for each Work Day that the Contractor is unable to perform the Work for at least onehalf of its current normal Work Day; and if the Work is suspended at the regular starting time on any Work Day and the Contractor's workforce is dismissed as a result of the suspension, then the Contractor will be entitled to a one Work Day extension of Contract Time whether or not conditions change thereafter and the major portion of the day is suitable for work.

**8.5.5** The Contractor shall use best available technologies to secure the site to mitigate/minimize the effects of inclement weather in conformance with applicable Federal, State, and regional regulatory requirements.

## **ARTICLE 9 - INSURANCE AND BONDS**

### **9.1 Faithful Performance and Payment Bonds**

- 9.1.1** The Contractor shall furnish to the District a Faithful Performance Bond, and maintain it in an amount not less than 100 percent of the current Contract Sum, conditioned upon the faithful performance by the Contractor of all covenants and stipulations in the contract.
- 9.1.2** The Contractor shall furnish to the District a Payment Bond and maintain it, in an amount not less than 100 percent of the current Contract Sum.
- 9.1.3** The Payment Bond and the Faithful Performance Bond shall be on the forms of the District as provided for in the RFP and shall be properly executed as described therein.
- 9.1.4** The bonds shall be executed by a sufficient, admitted surety insurer admitted to transact such business in California by the California Department of Insurance. After acceptance of the bond(s) by the District, a copy of the bond(s) will be returned to the Contractor.
- 9.1.5** If, at any time, during the performance of the Work any of the sureties, in the opinion of the District, are or become financially irresponsible, the District may require the Contractor to furnish other or additional sureties to the satisfaction of the District within 10 days after receipt of notice. If the Contractor fails to provide satisfactory sureties within the 10-day period, the contract may be terminated for cause under Article 11, and the materials purchased or the Work completed as provided in Article 11.
- 9.1.6** The Contractor and its sureties understand and agree that no modifications or alterations made in the Contract Documents shall operate to release any surety from liability on any bond or bonds required to be provided in this contract.

### **9.2 Insurance Requirements**

- 9.2.1** The Contractor shall procure and maintain during the period of the contract all required insurance and shall submit certificates of insurance and additional insured endorsements to the policies to the Engineer for review and approval. The certificates of insurance shall be on the forms provided by the District. The insurance requirements must be met within the same period allowed for contract execution, as stated in the RFP or RFQ.
- 9.2.2** The Contract will not be executed until the certificates of insurance and endorsements to the policies have been received and accepted by the District. Acceptance of the certificates of insurance and endorsements by the District shall



not relieve the Contractor from compliance with any of the insurance requirements or liability arising from said failure.

- 9.2.3** The District may require the Contractor to provide insurance policies to the Engineer for review. If requested, the Contractor agrees to provide the District with complete copies of the policies within 10 days following the request.
- 9.2.4** If the Contractor does not maintain all of the required insurance, or fails to timely deliver requested insurance policies to the District, the District reserves the right to stop the Work, and/or terminate the Contractor's right to proceed under the contract, in whole or in part. Any delay caused by the Work stoppage is an Inexcusable Delay.

## **ARTICLE 10 - WARRANTY**

### **10.1 Warranty of Work**

- 10.1.1** The Contractor warrants that any Work performed under the contract shall be performed in a competent manner in accordance with the duty of care set forth in Section 4.2.3; that any material furnished will be the best of its class; and that the Work shall fully meet the requirements of the Contract Documents.
- 10.1.2** The Contractor warrants workmanship, including subcontracted work, against defects for a period of one year from the date of Contract Completion unless a longer period of time is required by the Contract Documents.
- 10.1.3** The Contractor shall provide a similar one-year warranty for all materials and equipment provided under this contract unless a longer period of time is required by the Contract Documents.
- 10.1.4** If the District elects to use any portion or portions of the Work before Contract Completion, the warranty for those portions shall begin upon commencement of such use. The warranty for the remainder of the Work shall begin on the Contract Completion date.
- 10.1.5** If the District notifies the Contractor, within one year from the Contract Completion, or within any longer period of time required by the Contract Documents or another warranty period for partial occupancy as established under Article 10.4.1, that any portion of the Work fails to fulfill any of the requirements of the Contract Documents, the Contractor shall repair or replace the defective, non-conforming or otherwise unsatisfactory Work, without delay or further cost to the District in a manner that least inconveniences the District's operations. With regard to any defective work or material repaired or replaced by the Contractor, the one-year warranty will be measured from the date of the latest repair or replacement.

- 10.1.6** Should the Contractor fail to act promptly in accordance with this requirement, or should the exigencies of the case require repairs or replacements to be made before the Contractor can be notified or can respond to the notification, the District may, at its option, make the necessary repairs or replacements, or perform the necessary Work, and the Contractor shall pay to the District the actual cost of such repairs plus the markup percentages shown in Article 3.2.3.
- 10.1.7** If equipment has repeatedly malfunctioned, is unreliable, requires excessive maintenance, or if repair of the equipment will not result in equipment that is equivalent to that required by the Contract Documents (both in functionality and useful life), the Contractor shall replace, rather than repair, the equipment under the warranty.
- 10.1.8** The Contractor is responsible for all costs incidental to making good any and all of its warranties and agreements. These warranties and agreements are covenants that are binding on the Contractor and its sureties.

## **10.2 Warranty of Goods**

- 10.2.1** The Contractor warrants that all goods furnished will conform strictly with the specifications and requirements contained herein and with all approved submittals, samples and/or models and information contained or referenced therein, all affirmation of fact or promises, and will be new, of merchantable quality, free from defects in materials and workmanship, including but not limited to leaks, breaks, penetrations, imperfections, corrosion, deterioration, or other kinds of product deficiencies.
- 10.2.2** The Contractor warrants that all goods to be furnished will be fit and sufficient for the purpose(s) intended.
- 10.2.3** The Contractor warrants that all goods shall be delivered free from any security interest, lien or encumbrance of any kind, and free from any claim of infringement, copyright or other intellectual property violation, or other violation of laws, statutes, regulations, ordinances, rules, treaties, import restrictions, embargoes or other legal requirements.
- 10.2.4** The Contractor guarantees all products and services against faulty or inadequate design, manufacture, negligent or improper transport, handling, assembly, installation or testing, and further guarantees that there shall be strict compliance with all manufacturer guidelines, recommendations, and requirements, and that Contractor guarantees that it will conform to all requirements necessary to keep all manufacturer warranties and guarantees in full force and effect.
- 10.2.5** These warranties and guarantees are inclusive of all parts, labor and equipment necessary to achieve strict conformance, and shall take precedence over any conflicting warranty or guarantee.

**10.2.6** These warranties and guarantees shall not be affected, limited, discharged or waived by any examination, inspection, delivery, acceptance, payment, course of dealing, course of performance, usage of trade, or termination for any reason and to any extent.

**10.2.7** In the absence of any conflicting language as to duration, which conflicting language will take precedence as being more specific, Contractor's aforesaid warranties and guarantees shall be in full force and effect for a period of one year from the date of acceptance by the District but shall continue in full force and effect following notice from District of any warranty or guarantee issue, until such issue has been fully resolved to the satisfaction of the District.

## **ARTICLE 11 - TERMINATION OR SUSPENSION OF THE CONTRACT**

### **11.1 Termination by the District for Cause or Default**

**11.1.1** The District may terminate the Contractor's right to proceed under the contract, in whole or in part, for cause at any time after the occurrence of any of the following events:

- .1** The Contractor becomes insolvent or files for relief under the bankruptcy laws of the United States.
- .2** The Contractor makes a general assignment for the benefit of its creditors or fails to pay its debts as the same become due.
- .3** A receiver is appointed to take charge of the Contractor's property.
- .4** The Contractor abandons the Work. Abandonment is conclusively presumed when the District requests a written plan to cure a default and the Contractor does not submit the plan within five Work Days of the District's request.

**11.1.2** If any of the following events occur, the District may require that the Contractor submit a written plan to cure its default:

- .1** The Contractor fails to supply skilled supervisory personnel, an adequate number of properly skilled workers, proper materials, or necessary equipment to prosecute the Work in accordance with the Contract Documents.
- .2** The Contractor fails to make progress so as to endanger performance of the Work within the Contract Time.
- .3** The Contractor disregards legal requirements of agencies having jurisdiction over the Work, the Contractor, or the District.

- .4 The Contractor materially fails to execute the Work in accordance with the Contract Documents.
- .5 The Contractor is in default of any other material obligation under the Contract Documents.

**11.1.3** The District may terminate the Contractor's right to proceed under the contract in whole or in part for default if the written plan is not received by the District within five days after the District's request; if the District does not accept the Contractor's plan for curing its default; or the Contractor does not fully carry out an accepted plan to cure.

**11.1.4** Upon any of the occurrences referred to in Articles 11.1.1, 11.1.2 and 11.1.3, the District may, at its election and by notice to the Contractor, terminate the contract in whole or in part; accept the assignment of any or all of the subcontracts; and then complete the Work by any method the District may deem expedient. If requested by the District, the Contractor shall remove any part or all of the Contractor's materials, supplies, equipment, tools, and construction equipment and machinery from the Work within seven days of such request; and, if the Contractor fails to do so, the District may remove or store, and after 90 days sell, any of the same at the Contractor's expense.

**11.1.5** If the contract is terminated by the District as provided in Article 11.1, the Contractor shall not be entitled to receive any further payment until the expiration of 35 days after acceptance of all Work by the District.

**11.1.6** No termination or action taken by the District after termination shall prejudice any other rights or remedies of the District provided by law or by the Contract Documents.

**11.1.7** If, after termination for default, it is determined that the Contractor was not in default, or that default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for convenience pursuant to Article 11.2.

## **11.2 Termination by the District for Convenience**

**11.2.1** The District may, at its option, and for its convenience, terminate this contract at any time by giving written notice to the Contractor specifying the effective date of termination. Upon such termination, the Contractor agrees to comply with the notice and further agrees to waive any claims for damages, including loss of anticipated profits, on account of the termination in accordance with Article 11.2.5; and, as the sole right and remedy of the Contractor, the District shall pay the Contractor in accordance with Article 11.2.4.

**11.2.2** Upon receipt of notice of termination under Article 11.2, the Contractor shall, unless the notice directs otherwise, do the following:

- .1 Immediately discontinue the Work to the extent specified in the notice.
- .2 Place no further orders or subcontracts for materials, equipment, services, or facilities, except as may be necessary for completion of a portion of the Work that is not discontinued or is necessary to secure the project site.
- .3 Promptly cancel, on the most favorable terms reasonably possible, all subcontracts to the extent they relate to the performance of the discontinued portion of the Work.
- .4 Thereafter, do only such Work as may be necessary to preserve and protect Work already in progress and to protect materials, plants, and equipment in transit to or on the project site.

**11.2.3** Upon termination, the obligations of the contract shall continue as to portions of the Work already performed and, subject to the Contractor's obligations under Article 11.2.2, as to bona fide obligations assumed by the Contractor prior to the date of termination.

**11.2.4** Upon such termination, the District will pay to the Contractor the sum of the following:

- .1 The amount of the Contract Sum allocable to the portion of the Work properly performed by the Contractor as of the effective date of termination, less sums previously paid to the Contractor.
- .2 Previously unpaid costs of any items delivered to the project site that were already fabricated for subsequent incorporation into the Work.
- .3 Any proven losses with respect to materials and equipment directly resulting from the termination.
- .4 Reasonable demobilization costs.

**11.2.5** The above reimbursement is the sole and exclusive remedy to which the Contractor is entitled in the event the contract is terminated for convenience; and the Contractor expressly waives any other claims, damages, demands, compensation or recovery related to this contract or project. The Contractor agrees to sign a general release incorporating this waiver.

### **11.3 Suspension by the District**

- 11.3.1** The Engineer may, in his or her sole discretion, order the Contractor, in writing, to suspend, delay, or interrupt the Work in whole or in part for as long as 90 days from the date of delivery of a written order of suspension. The order shall be specifically identified as a "suspension order" under this Article. The work may be suspended for a longer period or periods if the parties agree. Upon receipt of a suspension order, the Contractor shall comply with its terms and take all reasonable steps to minimize costs related to the suspension of the Work or the portion of the Work. Within 90 days after the issuance of the suspension order, or such extension to that period as is agreed upon by the Contractor and the District, the District will either cancel the suspension order or delete the suspended Work.
- 11.3.2** If a suspension order is canceled or expires, the Contractor shall resume the suspended Work. A Change Order may be issued to cover any adjustments of the Contract Sum or an extension of Contract Time necessarily caused by the suspension. If the Contractor disputes the adjustment of the Contract Sum or the Contract Time, the Contractor shall submit a claim per Article 3.4.
- 11.3.3** Costs directly associated with the suspension will be at the District's expense if the suspension is not due to any fault of the Contractor.
- 11.3.4** A suspension order shall not be required to stop the Work as permitted or required under any other provision of the Contract Documents.

### **11.4 Termination or Suspension of the Contract - Act of God or Force Majeure**

- 11.4.1** If an Act of God or Force Majeure occurs, the Engineer may, by written notice, either suspend this contract pursuant to Article 11.3, or terminate this contract pursuant to Article 11.2. In the case of suspension pursuant to Article 11.4, the 90-day suspension period limitation in Article 11.3.1 shall not apply. If the contract is not suspended or terminated, or if the contract is resumed after suspension, the Contractor shall fully restore the work except as limited by Public Contract Code, Section 7105(a), in the case of an "Act of God."
- 11.4.2** If the contract is terminated because of an Act of God or Force Majeure, the Contractor will be paid for Work performed prior to the Act of God or Force Majeure at either (i) the Unit Prices named in the contract; or (ii) in the event no unit prices are named, a sum equal to the percentage that the Contract Sum for the Work completed, at the time of occurrence of the Act of God or Force Majeure bears to the Contract Sum for all Work to be performed under the contract as determined by the Engineer. In no event will the District be liable to the Contractor for breach of contract, extra work, or damages because the contract is terminated due to an Act of God or Force Majeure.

## **ARTICLE 12 - LABOR PROVISIONS**

## 12.1 Prevailing Wages

**12.1.1** Please see [www.dir.ca.gov](http://www.dir.ca.gov) for further information regarding the below.

**12.1.2** All Contractors and Subcontractors of any tier bidding on or offering to perform work on a public works project shall first be registered with the State Department of Industrial Relations (DIR) pursuant to Section 1725.5 of the Labor Code. No proposal or bid will be accepted, nor any contract entered into, without proof of the Contractor and Subcontractors' current registration with the DIR (LC §1771.1). All Contractors and Subcontractors shall remain registered for the duration of the Project. and for the duration of the project pursuant to Section 1725.5 of the Labor Code.

**12.1.3** All public works projects awarded after January 1, 2015, are subject to compliance monitoring and enforcement by the DIR (LC § 1771.4) and all Contractors are required to post job site notices, "as prescribed by regulation" (LC § 1771.4).

**12.1.4** Pursuant to Section 1773 of the Labor Code, the District has obtained from the Director of Industrial Relations of the State of California, the general prevailing rates of per diem wages and the general prevailing rates for holiday and overtime work in the locality in which the Work is to be performed, for each craft, classification, or type of worker needed to execute the contract. Pursuant to Section 1773.2 of the Labor Code, a copy of the prevailing wage rates is on file with the District and available for inspection by an interested party at [www.dir.ca.gov](http://www.dir.ca.gov).

**12.1.5** The holidays upon which such rates shall be paid shall be all holidays recognized in the collective bargaining agreement applicable to the particular craft, classification, or type of worker employed on the Work.

**12.1.6** The Contractor shall post a copy of the general prevailing rate of per diem wages at the jobsite pursuant to Section 1773.2 of the Labor Code and comply with all wage related workplace postings.

**12.1.7** Pursuant to Section 1774 of the Labor Code, the Contractor and any of its Subcontractors shall not pay less than the specified prevailing rate of wages to all workers employed in the execution of the contract.

**12.1.8** As set forth with more specificity in Section 1773.1 of the Labor Code, "per diem" wages include employer payments for health and welfare, pension, vacation, travel, subsistence and, in certain instances, apprenticeship or other training programs, and shall be paid at the rate and in the amount spelled out in the pertinent prevailing wage determinations issued by the Director of Industrial Relations.

**12.1.9** The Contractor shall, as a penalty to the State or the District, forfeit not more than the maximum set forth in Section 1775 of the Labor Code for each calendar day, or portion thereof, for each worker paid less than the prevailing rates for the work or

craft in which the worker is employed under the contract by the Contractor or by any Subcontractor under him. The difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which such worker was paid less than the stipulated prevailing wage rate shall be paid to such worker by the Contractor.

**12.1.10** The specified wage rates are minimum rates only and the District will not consider and shall not be liable for any claims for additional compensation made by the Contractor because of its payment of any wage rate in excess of the general prevailing rates. All disputes in regard to the payment of wages in excess of those specified herein shall be adjusted by the Contractor at its own expense.

**12.1.11** General prevailing wage determinations have expiration dates with either a single asterisk or a double asterisk. Pursuant to California Code of Regulations, Title 8, Section 16204(b), the single asterisk means that the general prevailing wage determination shall be in effect for the specified contract duration. The double asterisk means that the predetermined wage modification shall be paid after the expiration date. Notwithstanding what is stated in Article 3.4 and Article 4.7 of the General Conditions, no adjustment in the Contract Sum will be made for the Contractor's payment of these predetermined wage modifications.

## **12.2 Payroll Records for Prevailing Wages**

**12.2.1** The Contractor and each Subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the Work. The payroll records shall be certified and shall be available for inspection in accordance with the provisions of Section 1776 of the Labor Code.

**12.2.2** The Contractor shall submit for each week in which any contract Work is performed a copy of all payroll records to the Engineer. The Contractor shall be responsible for submission of copies of payroll records of all Subcontractors.

**12.2.3** Certified payroll records shall be on the forms provided by the Department of Industrial Relations or contain the same information required on the Department's form. Copies of the form may be obtained from:

Division of Labor Standards Enforcement  
Bureau of Field Enforcement  
2031 Howe Avenue, Suite 100  
Sacramento, CA 95825-5378  
(916) 263-1811  
(916) 263-5378



The Contractor or Subcontractor shall certify the payroll records as shown on the reverse of the State form. In addition, the records shall be accompanied by a statement signed by the Contractor or Subcontractor certifying that the classifications truly reflect the Work performed and that the wage rates are not less than those required to be paid.

**12.2.4** In the event of noncompliance with the requirements of Section 1776 of the Labor Code, the Contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects such Contractor must comply with said Section. Should noncompliance still be evident after such 10-day period, the Contractor shall, as a penalty to the State or the District, forfeit the amount set forth in Section 1776(h) of the Labor Code for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payments then due.

**12.2.5** The Contractor and all subcontractors are required to submit certified payroll records online, on a monthly basis to the Labor Commissioner.

### **12.3 Hours of Labor**

**12.3.1** Pursuant to the provisions of Sections 1810, et seq. of the Labor Code and any amendments thereof:

- .1** Eight hours of labor constitutes a legal day's Work under the contract.
- .2** The time of service of any worker employed upon the work shall be limited and restricted to eight hours during any one calendar day, and forty hours during any one calendar week except as provided in Article 12.3.1.4 below.
- .3** The Contractor shall, as a penalty to the State or the District, forfeit the amount set forth in Section 1813 of the Labor Code for each worker employed in the execution of the contract by the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any calendar day and forty hours in any one calendar week in violation of this Article and the provisions of Labor Code, Sections 1810, et seq.
- .4** Work performed by employees of the Contractor in excess of eight hours per day, and forty hours during any one calendar week, shall be permitted upon compensation for all hours worked in excess of eight hours per day at not less than one and one-half times the basic rate of pay.
- .5** The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by him in connection with the Work; the record

shall be kept open at all reasonable hours to the inspection of the District and to the Division of Labor Standards Enforcement of the State of California.

#### **12.4 Employment of Apprentices**

**12.4.1** In the performance of the contract, the Contractor and any Subcontractor shall comply with the provisions concerning the employment of apprentices in Section 1777.5 of the Labor Code and any amendments thereof.

**12.4.2** In the event the Contractor or any Subcontractor willfully fails to comply with the aforesaid section, such Contractor or Subcontractor shall be subject to the penalties for noncompliance in Labor Code, Section 1777.7.

### **ARTICLE 13 - MISCELLANEOUS PROVISIONS**

#### **13.1 Governing Law**

The contract is governed by the laws of the State of California.

#### **13.2 Antitrust Claims**

By entering into the contract, the Contractor offers and agrees to assign to the District all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the contract. The Contractor shall include in each subcontract a provision corresponding to the foregoing binding the Subcontractor to offer and agree to assign to the District such rights, title, and interest held by the Subcontractor. Such assignment shall be made and become effective at the time the District tenders final payment to the Contractor without further acknowledgment by the parties.

#### **13.3 Non-Discrimination Clauses**

**13.3.1** There shall be no discrimination against any person, or groups of persons, per Government Code Section 12940, Labor Code Section 1735, or any other applicable law or regulation in the performance of this contract.

**13.3.2** There shall be no discrimination in the performance of this contract, against any person, or group of persons, on account of race, color, religion, religious creed, national origin, ancestry, gender including gender identity or expression, age (over 40), marital or domestic partnership status, mental disability, physical disability (including HIV and AIDS), medical condition (including genetic characteristics or cancer), veteran or military status, family or medical leave status, genetic

information, or sexual orientation. The Contractor shall not establish or permit any such practice(s) of discrimination with reference to the contract. Contractors determined to be in violation of this section will be deemed to be in material breach of the contract.

**13.3.3 Contractor and its subcontractors shall abide by the requirements of 41 CFR §§ 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination against all individuals based on their race, color, religion, sex, sexual orientation, gender identity, or national origin in the performance of this contract. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, national origin, protected veteran status or disability.**

**13.3.4** The Contractor shall include the nondiscrimination and compliance provisions of these clauses in all subcontracts.

#### **13.4 Trenching and Shoring**

The Contractor shall comply with Labor Code, Sections 6500, 6705, and 6707, and Public Contract Code, Section 7104, regarding trenching and shoring, and not withstanding any other provisions of the Contract Documents.

#### **13.5 Third Party Claims**

Pursuant to Public Contract Code, Section 9201, the District will provide Contractor with timely notification of the receipt of any third-party claims relating to this contract.

#### **13.6 Prohibition of Assignment**

The Contractor shall not assign, transfer, or otherwise dispose of any of its rights, duties or obligations under this Contract. This prohibition does not apply to the District. The District retains the right to assign this Contract in whole or in part at any time upon reasonable terms.

#### **13.7 News Releases**

The Contractor, its employees, subcontractors, and agents shall not refer to the District, or use any logos, images, or photographs of the District for any commercial purpose, including, but not limited to, advertising, promotion, or public relations, without the District's prior written consent. Such written consent shall not be required for the inclusion of the District's name on a customer list.

### **13.8 Severability**

Should any part of the Contract be declared by a final decision by a court or tribunal of competent jurisdiction to be unconstitutional, invalid or beyond the authority of either party to enter into or carry out, such decision shall not affect the validity of the remainder of the Contract, which shall continue in full force and effect, provided that the remainder of the Contract can be interpreted to give effect to the intentions of the parties.

### **13.9 Covenant Against Gratuities**

The Contractor warrants that no gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the District with a view toward securing the Contract or securing favorable treatment with respect to any determinations concerning the performance of the Contract. For breach or violation of this warranty, the District shall have the right to terminate the Contract, either in whole or in part, and any loss or damage sustained by the District in procuring on the open market any items which Contractor agreed to supply shall be borne and paid for by the Contractor. The rights and remedies of the District provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or in equity.

### **13.10 Rights and Remedies of the District**

The rights and remedies of the District provided herein shall not be exclusive and are in addition to any other rights and remedies provided by law or under the Contract.

### **13.11 Waiver of Rights**

Any action or inaction by the District, or the failure of the District on any occasion, to enforce any right or provision of the Contract, shall not be construed to be a waiver by the District of its rights and shall not prevent the District from enforcing such provision or right in any future occasion. Rights and remedies are cumulative and are in addition to any other rights or remedies that the District may have at law or in equity.

### **13.12 Confidentiality**

Contractor agrees to maintain in confidence and not disclose to any person or entity, without the District's prior written consent, any trade secret or confidential information, knowledge or data relating to products, process, or operation of the District. Contractor further agrees to maintain in confidence and not disclose to any person or entity, any data, information, technology, or material developed or obtained by Contractor during term of the Contract. The covenants contained in this paragraph shall survive the termination of this Contract for whatever cause.

END OF DOCUMENT

**EXHIBIT D – BOND FORMS**



DATE \_\_\_\_\_

# PAYMENT BOND

CONTRACTOR (Name and California address where service may be effected)

SURETY (Name and California address where service may be effected)

AMOUNT OF BOND (Sum in words and figures)

CONTRACT DOCUMENTS (As named in the Contract)

**KNOW ALL PERSONS BY THESE PRESENTS:**

THAT, WHEREAS, the contractor named above, hereinafter called the Contractor, has this day entered into a Contract with East Bay Municipal Utility District, hereinafter called the District, to perform and complete the work set forth in the Contract Documents named in the Contract, all now on file in the office of the Secretary of the District, as will more fully appear by reference to said Contract, which is made a part hereof; and

WHEREAS, Sections 9550 to 9566 inclusive of the Civil Code of the State of California, and any amendments thereof, require contractors upon public work to file with the body by whom such contract was awarded a good and sufficient bond to secure the claims to which reference is made in said sections, NOW THESE PRESENTS

WITNESSETH: That the Contractor, as Principal, and the Surety named above, as Surety, are held and firmly bound unto any and all materialmen, persons, firms, or corporations furnishing materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, and to all persons, firms or corporations renting or hiring implements or machinery for or contributing to the said work to be done and to all persons who perform work or labor of any kind or nature thereon, or in connection therewith, and to all persons who supply both work and materials, in the sum entered on the first page hereof, lawful money of the United States of America, being not less than the total amount payable by the terms of said Contract, for which payment well, truly and promptly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly, and severally, firmly by these presents.

**PAYMENT BOND**

The condition of the above obligation is such that if the Contractor, or the Contractor’s subcontractors, fail to pay for any materials, provisions or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, the Surety will pay for the same, in an amount not exceeding the sum specified in this Bond, provided that any and all claims hereunder shall be filed and proceedings had in connection therewith as required by the provisions of said Sections 9550 to 9566 inclusive of the Civil Code of the State of California, and any amendments thereof: PROVIDED ALSO, that in case suit is brought upon this Bond a reasonable attorney’s fee shall be awarded by the court to the prevailing party in said suit, said attorney’s fee to be fixed as costs in said suit, and to be included in the judgment therein rendered.

No prepayment or delay in payment and no change, extension, addition, or alteration of any provision of said Contract or Contract Documents agreed to between the Contractor and the District, and no forbearance on the part of the District, shall operate to release the Surety from liability on this Bond, and consent to make such alterations without further notice to or consent by the Surety is hereby given, and the Surety hereby waives the provisions of Section 2819 of the Civil Code of the State of California.

Dated the day and year entered on the first page hereof.

Each signator to this bond hereby declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

\_\_\_\_\_  
Contractor

By \_\_\_\_\_

\*Title \_\_\_\_\_

By \_\_\_\_\_

\*\*Title \_\_\_\_\_

(SEAL OF SURETY)

\_\_\_\_\_  
Surety

By \_\_\_\_\_

Title \_\_\_\_\_

*Note: The signature of the Surety on this bond must be acknowledged before a Notary Public. An executed Power of Attorney indicating that the Surety’s representative is authorized to bind the Surety must accompany this bond.*

The foregoing Bond was accepted and approved this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_

\_\_\_\_\_, East Bay Municipal Utility District

Specifications / Proposal No. \_\_\_\_\_

\*If corporation, Corporate President or CEO; if Partnership, Partner.  
\*\*Corporate Secretary or financial officer.

## **EXHIBIT E – DRAWINGS**



# EBMUD EL SOBRANTE WATER TREATMENT PLANT AST & GENERATOR DAY TANK REPLACEMENT

5500 AMEND RD  
EL SOBRANTE, CA 94803



OVERALL SITE PLAN



VICINITY MAP

## GENERAL SCOPE OF WORK

REMOVE EXISTING 2,000 GALLON AST, 50-GALLON DAY-TANK AND ASSOCIATED PIPING. ABANDON IN PLACE EXISTING 1000 GALLON DIESEL UNDERGROUND STORAGE TANK (UST). REMOVE EXISTING TANK SUMP AND SECTION OF EXISTING SUPPLY AND RETURN PIPING.

INSTALL ONE (1) 2,000 GALLON DIESEL FUEL ABOVEGROUND STORAGE TANK (AST) ON EXISTING CONCRETE SLAB.

INSTALL ONE (1) 50 GALLON GENERATOR DAY TANK WITH DUPLEX SUCTION PUMPS & RETURN PUMP.

INSTALL NEW TANK MONITOR AND SENSOR SYSTEMS.

## GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT. CONTRACTOR TO FINALIZE/OBTAIN FIRE DEPARTMENT APPROVAL. CONTRACTOR TO COORDINATE REQUIRED INSPECTIONS AS REQUIRED BY PERMIT CONDITIONS.
2. ABOVEGROUND TANK AND FUEL SYSTEM INSTALLATION SHALL BE IN COMPLIANCE WITH CONTRA COSTA COUNTY HEALTH SERVICES ABOVEGROUND PETROLEUM STORAGE (AGPS) REGULATIONS. EBMUD TO PROVIDE SPCC PLAN IF REQUIRED.
3. CONTRACTOR SHALL OBTAIN HEALTH DEPARTMENT APPROVAL FOR UST ABANDONMENT IN PLACE. CONTRACTOR SHALL COMPLY WITH HEALTH DEPARTMENT REQUIREMENTS. EBMUD TO PROVIDE THE REQUIRED DIRECTIONAL DRILLING, SOIL SAMPLING AND SAMPLE ANALYSIS AS NEEDED FOR PERMIT REVIEW AND APPROVAL.
4. CONTRACTOR SHALL OBTAIN BUILDING PERMIT FROM CONTRA COSTA COUNTY BUILDING DEPARTMENT. CONTRACTOR SHALL COORDINATE ALL REQUIRED INSPECTIONS AS NEEDED TO OBTAIN PERMIT JOB CARD SIGN-OFF.

## DESIGN CRITERIA:

RISK CATEGORY: III PER 2022 CBC TABLE 1604.5  
SEISMIC DESIGN CATEGORY: 'E' PER 2022 CBC 16.3.2.5  
SITE CLASSIFICATION: 'D' PER 2022 CBC 1613.3.2.2  
WIND SPEED: 93 MPH  
EXPOSURE CATEGORY: 'B' PER 2022 CBC 1609.4.3

## APPLICABLE CODES

ALL INSTALLATION AND TESTS SHALL COMPLY WITH THE FOLLOWING CODES & STANDARDS:

CBC 2022  
CFC 2022  
CEC 2022  
NFPA 30, 2018, FLAMMABLE & COMBUSTIBLE LIQUIDS

## LIST OF DRAWINGS

DWG.	DESCRIPTION
T-1	TITLE SHEET
D-1	DEMOLITION SITE PLAN
A-1	OVERALL SITE PLAN ABOVEGROUND TANK INSTALLATION
F-1	2,000 GALLON AST INSTALLATION DETAIL
F-2	2,000 GALLON AST & DAY-TANK INSTALLATION DETAIL
F-3	MISCELLANEOUS DETAILS
F-4	VEEDER-ROOT DIAGRAMS
E-1	ELECTRICAL SCHEDULES & DETAILS
E-2	AREA CLASSIFICATION PLAN
E-3	AST ELECTRICAL PLANS
E-4	ENERGY COMPLIANCE - TITLE 24

## STATEMENT OF SPECIAL INSPECTION AS REQUIRED BY 2022 CBC 1704.3.1

SPECIAL INSPECTIONS SHALL BE PERFORMED FOR THIS PROJECT. THESE AREAS ARE:

- 1) POST INSTALLED CONCRETE ANCHORS.

A COMPLETED SPECIAL INSPECTION, STRUCTURAL OBSERVATION AND TESTING AGREEMENT WILL BE COMPLETED AND FILED WITH THE CONTRA COSTA COUNTY BUILDING DEPARTMENT AND THE OWNER. ENGINEER OF RECORD AND CONTRACTOR RESPONSIBILITIES SHALL BE REVIEWED BY EACH PARTY. THE SPECIAL INSPECTOR SHALL FOLLOW THE INSTRUCTIONS FOR THE SPECIAL INSPECTION AND REPORTING TASKS AS OUTLINED IN THE AGREEMENT.



Know what's below.  
Call 811 before you dig.

ENGINEERS NOTE TO CONTRACTOR:  
THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES, PIPES, AND/OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF THOSE UNDERGROUND UTILITIES TO BE USED AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

UNAUTHORIZED CHANGES & USES:  
THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

NO.	DATE	REVISIONS DESCRIPTION
1	3/15/24	REVISED PER CLIENT COMMENTS

701 N. Parkcenter Dr. Santa Ana, CA 92705 p: 714/560/8222 www.tait.com	1: 714/79782615	Denver Phoenix San Diego Sacramento Dallas
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**TAIT**  
Since 1964

SHEET TITLE: T-1

TITLE SHEET: EL SOBRANTE WATER TREATMENT PLANT  
5500 AMEND RD  
EL SOBRANTE, CA 94803

PROJECT ADDRESS: EL SOBRANTE WATER TREATMENT PLANT  
5500 AMEND RD  
EL SOBRANTE, CA 94803

CLIENT: EBMUD  
PLANT ENGINEERING SERVICES/CONSTRUCTION  
315 11TH ST  
OAKLAND, CA 94607

CHECKED: B. DUREE  
DRAWN BY: B. DUARTE  
JOB NUMBER: T8094307

DATE: 1/26/24  
SHEET: 1 OF 11  
SCALE: NOTED

BID SET 3/15/24

**UNDERGROUND STORAGE TANK SYSTEM AND SUMP CLOSURE REQUIREMENTS**

**A. GENERAL INFORMATION**

THESE REQUIREMENTS ARE APPLICABLE TO PERMANENT CLOSURE OF HAZARDOUS MATERIAL UNDERGROUND STORAGE TANK (UST) SYSTEMS (I.E., TANKS AND PIPING), AND SUMPS REGULATED BY THE UNIDOC'S GUIDELINES FOR ADOPTION OF CALIFORNIA UNDERGROUND STORAGE TANK REGULATIONS (UN-001). ALL UNIDOC'S DOCUMENTS ARE AVAILABLE AT WWW.UNIDOC'S.ORG.

1. A PERMIT FOR REMOVAL OF UST SYSTEMS OR SUMPS WILL BE ISSUED UPON APPROVAL OF AN UNDERGROUND STORAGE TANK SYSTEM CLOSURE PERMIT APPLICATION (UN-003) BY THE LOCAL UNIFIED PROGRAM AGENCY (UPA) HAVING RESPONSIBILITY FOR THE UST PROGRAM. THE PERMIT APPLICATION FORM IS AVAILABLE AT WWW.UNIDOC'S.ORG.
2. UPON SATISFACTORY REVIEW AND APPROVAL OF THE CLOSURE PERMIT APPLICATION BY THE UPA, THE OWNER OF THE UST SYSTEM OR SUMP SHALL CARRY OUT THE PROPOSED ACTIONS. UNLESS STATED OTHERWISE BY THE UPA, TANK AND SUMP REMOVAL ACTIVITIES SHALL BE WITNESSED BY A REPRESENTATIVE FROM THE UPA. CLOSURE INSPECTIONS MUST BE SCHEDULED AT LEAST TWO (2) WORKING DAYS IN ADVANCE.
3. OWNERS/OPERATORS OF TANK SYSTEMS OR SUMPS UNDERGOING CLOSURE MAY BE REQUIRED TO POSSESS THE FOLLOWING NUMBERS RELATED TO THE MANAGEMENT OF HAZARDOUS WASTES:
  - a. EPA IDENTIFICATION NUMBER [INFORMATION AVAILABLE AT WWW.DTSC.CA.GOV/DMANIFEST/INDEX.CFM].
  - b. HAZARDOUS WASTE GENERATOR FEE ACCOUNT NUMBER [INFORMATION AVAILABLE AT WWW.BOE.CA.GOV].
4. CONTRACTORS SHALL POSSESS A CURRENT CONTRACTOR LICENSE (A, B, C-36, OR C-61/D-40) AND HAZARDOUS SUBSTANCE REMOVAL CERTIFICATE ISSUED BY THE CONTRACTORS STATE LICENSE BOARD (CSLB); WORKERS COMPENSATION INSURANCE; AND, IF REQUIRED BY LOCAL MUNICIPAL CODE, BUSINESS LICENSE. CSLB LICENSE AND INSURANCE STATUS CAN BE CHECKED AT WWW.CSLB.CA.GOV.
5. THE LOCAL AIR QUALITY MANAGEMENT DISTRICT MAY REQUIRE SUBMITTAL OF AN UNDERGROUND STORAGE TANK OR TREATMENT OF CONTAMINATED SOIL NOTIFICATION FORM PRIOR TO REMOVAL OF ANY TANK CONTAINING ORGANIC MATERIAL. DISTRICT CONTACT INFORMATION IS AVAILABLE AT WWW.ARB.CA.GOV/CAPCOA/ROSTER.HTM.
6. UNDERGROUND SERVICE ALERT SHOULD BE CONTACTED AT (800) 227-2600 AT LEAST TWO WORKING DAYS PRIOR TO THE START OF EXCAVATION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT CONDITIONS AT THE SITE PROVIDE FOR WORKPLACE SAFETY, PROTECTION OF THE ENVIRONMENT, AND MAINTENANCE OF INTEGRITY OF NEARBY STRUCTURES.
8. CAL/OSHA REQUIRES THAT A SITE-SPECIFIC SAFETY PLAN BE MAINTAINED ON SITE DURING CLOSURE ACTIVITIES.
9. BACKFILLING OF EXCAVATIONS SHALL BE DONE IN COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS.
10. WELLS SHALL BE DESTROYED AS REQUIRED BY FEDERAL, STATE, AND LOCAL REQUIREMENTS. A PERMIT FROM THE SANTA CLARA VALLEY WATER DISTRICT IS REQUIRED FOR WELL DESTRUCTION. WELL CLOSURE PERMIT INFORMATION IS AVAILABLE AT WWW.SCVWD.DST.CA.US/EKCONTENT.ASPX?ID=354&TERMS=WELL+REMOVAL+PERMIT.
11. CHECK WITH OTHER LOCAL AGENCIES (E.G., BUILDING AND/OR PUBLIC WORKS DEPARTMENTS) REGARDING REQUIREMENTS FOR ADDITIONAL PERMITS (E.G., ELECTRICAL, PLUMBING, EXCAVATION, COMPACTION AND GRADING, ETC.) AND ANY WORK IMPACTING PUBLIC STREETS, WALKWAYS, AND RIGHTS-OF-WAY.
12. THE FACILITY OPERATOR SHALL ELECTRONICALLY SUBMIT A NEW OR REVISED HAZARDOUS MATERIALS BUSINESS PLAN (HMBP) AT CERS.CALEPA.CA.GOV OR THE LOCAL UPA'S ELECTRONIC REPORTING PORTAL, IF APPLICABLE.

**B. TANK REMOVAL**

1. HAZARDOUS MATERIALS SHALL BE REMOVED FROM TANKS AND PIPING PRIOR TO TANK SYSTEM REMOVAL AND MUST BE PROPERLY MANAGED. THE AIR QUALITY MANAGEMENT DISTRICT REQUIRES THAT VOC RESIDUALS IN TANKS AMOUNT TO LESS THAN 1/1,000 OF THE TANK VOLUME (I.E., LESS THAN 5 GALLONS VOC REMAINING IN A 5,000 GALLON TANK). TO ACHIEVE THIS, RINSING AND/OR TIPPING AND PUMPING OF THE TANK(S) MAY BE NECESSARY. MATERIALS GENERATED AS THE RESULT OF THE RINSING OR DECONTAMINATION OF TANKS SHALL BE MANAGED AS HAZARDOUS WASTE UNLESS A WRITTEN HAZARDOUS WASTE DETERMINATION PER 22 CCR §66262.11 DEMONSTRATES THAT THE WASTE IS NON-HAZARDOUS.
2. ALL TANKS AND PIPING SHALL BE MANIFESTED AND HAULED BY A LICENSED HAZARDOUS WASTE TRANSPORTER TO A PERMITTED HAZARDOUS WASTE FACILITY, WHETHER OR NOT THEY HAVE BEEN RINSED ON SITE, UNLESS THEY HAVE BEEN CLEANED ON-SITE AND CERTIFIED AS NON-HAZARDOUS IN ACCORDANCE WITH CALIFORNIA CODE OF REGULATIONS, TITLE 22, DIVISION 4.5, CHAPTER 32. [REFER TO THE UNIDOC'S TANK SYSTEM ON-SITE CLEANING REQUIREMENTS (UN-065) GUIDANCE DOCUMENT.]
3. TANKS SHALL BE REMOVED FROM THE EXCAVATION WITHIN 24 HOURS OF REMOVAL OF BACKFILL AND SHALL BE TRANSPORTED OFF-SITE ON THE SAME CALENDAR DAY THEY ARE REMOVED FROM THE GROUND OR THEY MAY BE REQUIRED TO BE PLACED BACK INTO THE EXCAVATION.
4. TANK REMOVAL OR RELOCATION MAY BEGIN ONLY AFTER THE LOCAL AGENCY INSPECTOR HAS GIVEN APPROVAL.
5. ALL ELECTRICAL SERVICE TO TANK(S)/PUMPS SHALL BE TERMINATED PRIOR TO START OF EXCAVATION.
6. DISPENSERS/PUMPS AND ALL ASSOCIATED PIPING SHALL BE REMOVED OR CAPPED IF UNABLE TO BE REMOVED. [NOTE: PLUMBING PERMITS MAY BE REQUIRED.]
7. FOR TANKS PREVIOUSLY CONTAINING FLAMMABLE/COMBUSTIBLE MATERIALS, THE TANK CLOSURE CONTRACTOR SHALL PROVIDE, ON-SITE AND READILY ACCESSIBLE, AT LEAST ONE 40BC RATED PORTABLE FIRE EXTINGUISHER AND A CALIBRATED METER CAPABLE OF MEASURING LEL (LOWER EXPLOSIVE LIMIT) AND OXYGEN LEVELS.
8. TANKS PREVIOUSLY CONTAINING FLAMMABLE/COMBUSTIBLE MATERIALS SHALL BE MADE SAFE FOR REMOVAL FROM THE EXCAVATION BY THE ADDITION OF DRY ICE (CARBON DIOXIDE) OR OTHER METHODS APPROVED BY THE LOCAL AGENCY SUFFICIENT TO ACHIEVE AN ATMOSPHERE OF EITHER LESS THAN 10% OXYGEN OR LESS THAN 20% LEL.
9. ALL OPENINGS OTHER THAN A PRESSURE RELIEF HOLE AT THE TOP OF EACH TANK TO ALLOW FOR VENTING SHALL BE CAPPED OR PLUGGED IMMEDIATELY AFTER REMOVAL.
10. THE CLOSURE CONTRACTOR SHALL PROVIDE TANK REMOVAL/LIFTING EQUIPMENT OF A SIZE ADEQUATE TO SAFELY LIFT THE TANKS ONTO THE TRANSPORT VEHICLE WITHOUT DRAGGING THEM OR OTHERWISE CAUSING AN UNSAFE CONDITION.
11. IF AN EXCAVATION IS TO REMAIN OPEN AFTER THE CONTRACTOR LEAVES THE SITE, THE EXCAVATION PERIMETER SHALL BE FENCED 6 FEET HIGH OR POSTED WITH A 24-HOUR GUARD.

12. STOCKPILES OF CONTAMINATED/SUSPECT SOIL SHALL BE STORED ON BERMED PLASTIC AND COVERED. CONTACT THE LOCAL OVERSIGHT PROGRAM (LOP) AND THE AIR QUALITY MANAGEMENT DISTRICT REGARDING TREATMENT AND DISPOSAL OF CONTAMINATED SOIL.

**C. SOIL AND GROUNDWATER SAMPLING**

1. UNLESS SPECIFICALLY STATED OTHERWISE IN WRITING BY THE LOCAL UPA HAVING RESPONSIBILITY FOR THE UST PROGRAM, THE COLLECTION OF ALL SAMPLES REQUIRED PURSUANT TO 23 CCR §2672(D) MUST BE WITNESSED BY REPRESENTATIVE FROM THE UPA. SAMPLING PERFORMED OTHERWISE SHALL BE CONSIDERED INVALID AND MUST BE REPEATED UNDER UPA OVERSIGHT AT THE UST OWNER/OPERATOR'S EXPENSE.
2. COLLECTION OF SAMPLES SHALL OCCUR DURING OR IMMEDIATELY AFTER TANK CLOSURE ACTIVITIES. SOIL SAMPLES SHALL BE TAKEN IMMEDIATELY BENEATH THE REMOVED PORTIONS OF THE TANK SYSTEM. A MINIMUM OF TWO FEET INTO NATIVE MATERIAL, IN ACCORDANCE WITH THE FOLLOWING TABLE:

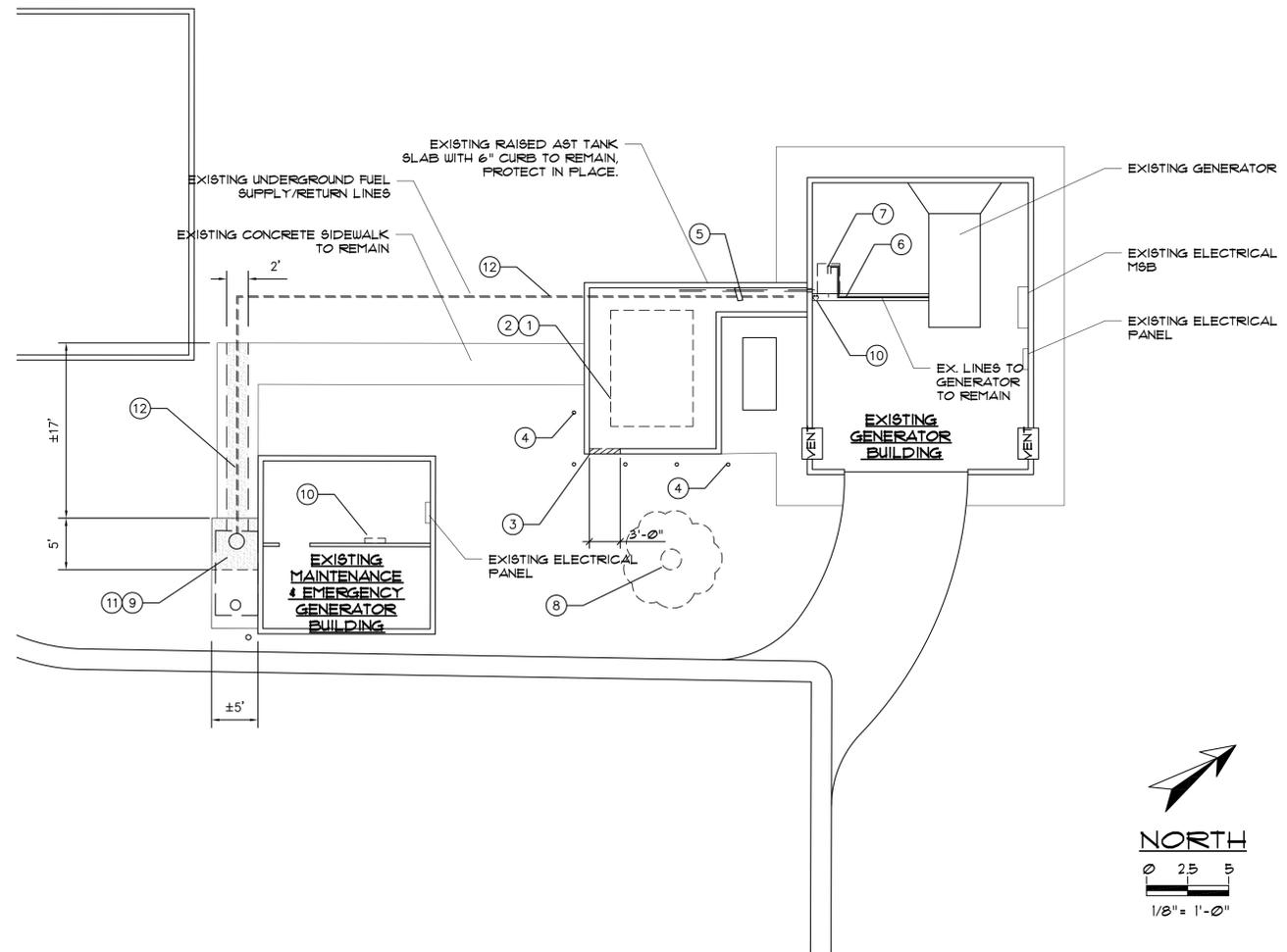
SAMPLING FOR ROUTINE PETROLEUM OR SOLVENT TANK REMOVALS:				
WATER IN EXCAVATION?	TANK SIZE	MINIMUM # OF SOIL SAMPLES	LOCATION OF SOIL SAMPLES	MINIMUM # OF WATER SAMPLES
NO	≤ 10,000 GAL.	3 PER TANK	ONE AT EACH END OF TANK	NONE
NO	> 10,000 GAL.	3 OR MORE PER TANK	ENDS AND MIDDLE OR SPACED ALONG TANK LENGTH	NONE
YES	10,000 GAL. OR LESS (SINGLE TANK)	2	FROM WALL NEXT TO TANK ENDS AND AT SOIL/GROUNDWATER INTERFACE	1
YES	>10,000 GAL OR TANK CLUSTER.	4	FROM WALL NEXT TO TANK ENDS AT SOIL/GROUNDWATER INTERFACE	1

3. SOIL SAMPLES SHALL ALSO BE REQUIRED UNDER DISPENSERS AND EVERY 20 LINEAR FEET ALONG PIPING RUNS AND AS DIRECTED BY THE INSPECTOR OVERSEEING CLOSURE. WHERE PIPELINE SAMPLES CANNOT BE TAKEN (E.G., UNDER STRUCTURES), PIPELINE PRESSURE-TESTING SHALL BE REQUIRED TO DETERMINE IF LEAKAGE HAS OCCURRED. ADDITIONAL SAMPLES MAY BE REQUIRED.
4. COLLECTION OF SAMPLES SHALL BE DONE IN ACCORDANCE WITH THE FOLLOWING SANTA CLARA COUNTY LEAKING UNDERGROUND STORAGE TANK LOCAL OVERSIGHT PROGRAM (LOP) REQUIREMENTS:
  - a. DISCRETE, UNDISTURBED SOIL SAMPLES SHALL BE COLLECTED.
  - b. IF THE EXCAVATION CANNOT BE ENTERED, SOIL SAMPLES CAN BE COLLECTED USING A SLIDE HAMMER WITH EXTENSIONS. IF THAT IS NOT FEASIBLE, SOIL SAMPLES ARE GENERALLY COLLECTED FROM A BACKHOE BUCKET FOR SAFETY REASONS. IF SAMPLES ARE COLLECTED FROM A BACKHOE BUCKET, THE SLOUGH AT THE SURFACE OF THE SOIL SHOULD BE REMOVED AND RELATIVELY UNDISTURBED SOIL SHOULD BE CHOSEN FOR SAMPLING. A BRASS OR STAINLESS STEEL SLEEVE SHOULD BE DRIVEN INTO THE SOIL TO COLLECT THE SAMPLE.
  - c. SAMPLES SHALL BE COLLECTED IN BRASS OR STAINLESS STEEL SLEEVES. SAMPLES CONTAINING VOLATILE ORGANIC CHEMICALS SHALL COMPLETELY FILL THE SAMPLE CONTAINER WITH NO HEADSPACE. SLEEVES ARE PREFERRED WHEN SAMPLING FOR VOLATILE ORGANIC CHEMICALS. SAMPLES CONTAINING VOLATILE CONSTITUENTS MUST BE COLLECTED AT A MINIMUM OF 12 INCHES BELOW THE SURFACE OF STOCKPILES AND EXCAVATIONS.
  - d. SOIL SAMPLE SLEEVE ENDS SHALL BE COVERED WITH TEFLON SHEETING, CAPPED WITH PLASTIC SLIP CAPS, TAPED, AND LABELED TO IDENTIFY LOCATION AND DEPTH. IF IT IS NECESSARY TO COLLECT SAMPLE IN GLASS JARS, THEY SHOULD BE CLOSED WITH A TEFLON-LINED LID, TAPED, AND LABELED TO IDENTIFY LOCATION AND DEPTH. GLASS JARS ARE NOT TO BE USED FOR SAMPLES CONTAINING OR SUSPECTED OF CONTAINING VOLATILE ORGANIC COMPOUNDS.
  - e. SAMPLES SHALL BE PLACED IMMEDIATELY INTO A COOLED CONTAINER AND MAINTAINED AT 4°C UNTIL DELIVERY TO A CALIFORNIA CERTIFIED HAZARDOUS WASTE TESTING LABORATORY. PROPER CHAIN-OF-CUSTODY PROCEDURES MUST BE FOLLOWED. THE LABORATORY MUST STATE THE CONDITION OF THE SAMPLES UPON RECEIPT (E.G., CHILLED, SEALS INTACT).
  - f. THE LABORATORY MUST RECEIVE SAMPLES WITHIN 24 HOURS OF SAMPLING AND LABORATORY ANALYSIS MUST OCCUR WITHIN THE ALLOWED HOLDING TIME.
  - g. DATA GENERATED BY FIELD INSTRUMENTS SUCH AS PHOTO-IONIZATION AND FLAME-IONIZATION DETECTORS SHOULD BE USED FOR RECORDING FIELD CONDITIONS; HOWEVER, THEY ARE NOT ACCEPTABLE FOR QUANTIFYING CONTAMINANT CONCENTRATIONS.
5. SAMPLE RESULTS WITHOUT A PROPERLY COMPLETED CHAIN-OF-CUSTODY FORM SHALL BE CONSIDERED INVALID AND RE-SAMPLING WILL BE REQUIRED. THE LABORATORY SHALL NOTE, ON THE CHAIN-OF-CUSTODY OR IN THE LAB REPORT, THE STATUS OF EVIDENCE TAPE AND CONDITION OF SAMPLES AT TIME OF SAMPLE RECEIPT.
6. SOIL AND GROUNDWATER SAMPLES SHALL BE ANALYZED AS DESCRIBED IN THE REQUIRED LABORATORY ANALYSES FOR UNDERGROUND STORAGE TANK SYSTEM CLOSURE (UN-039) AND APPLICABLE REGIONAL WATER QUALITY CONTROL BOARD GUIDELINES.
7. SAMPLES SHALL NOT BE COMPOSITED BY THE LABORATORY AND ANALYZED TOGETHER.
8. IF CONTAMINATION OF ANY DETECTABLE CONCENTRATION IS FOUND, FURTHER SOIL AND GROUNDWATER INVESTIGATION MAY BE REQUIRED. AT THIS POINT THE SITE WILL BE REFERRED TO THE LOP AND/OR APPLICABLE REGIONAL WATER QUALITY CONTROL BOARD (WWW.WATERBOARDS.CA.GOV) FOR OVERSIGHT OF REMEDIAL ACTION.

**D. SUMP CLOSURE**

ALL RELEVANT REQUIREMENTS FOR UST CLOSURE SHALL APPLY TO SUMP CLOSURE ACTIVITIES. THE FOLLOWING REQUIREMENTS ARE SPECIFIC TO SUMP CLOSURE:

1. ALL PIPING AND SEWER CONNECTIONS SHALL BE REMOVED WHERE APPLICABLE. [NOTE: PLUMBING PERMITS MAY BE REQUIRED.]
2. SUMPS SHALL BE SAMPLED TO DETERMINE PROPER DISPOSAL METHOD, OR DISPOSED OF AS HAZARDOUS WASTE BASED ON GENERATOR KNOWLEDGE OF HAZARDOUS NATURE. SPECIFIC SAMPLE ANALYSES REQUIRED IS DEPENDENT UPON MATERIALS WHICH WERE OR MIGHT HAVE BEEN INTRODUCED INTO THE SUMP STRUCTURE.
3. CONCRETE SHALL BE CORED OR JACK HAMMERED TO PERMIT COLLECTION OF NATIVE SOIL SAMPLES FROM BENEATH THE STRUCTURE. SOIL SAMPLES MAY BE REQUIRED FROM BENEATH ANY PIPING RUN.
4. SUMPS MAY BE EITHER REMOVED FROM THE GROUND AND DISPOSED OF IN AN APPROVED MANNER, OR CRUSHED IN PLACE AND BACKFILLED SUBJECT TO THE APPROVAL OF THE INSPECTOR OVERSEEING CLOSURE AND IN ADHERENCE TO OTHER APPLICABLE LOCAL REQUIREMENTS.



**XX GENERAL SCOPE OF WORK - AST DEMOLITION**

ALL CONSTRUCTION IS EXISTING AND TO REMAIN UNLESS NOTED OTHERWISE. CONTRACTOR TO VERIFY FIELD CONDITIONS AND DIMENSIONS PRIOR TO START OF CONSTRUCTION.

- AST DEMOLITION NOTES:**
- 1 REMOVE EXISTING 2000 GALLON CONCRETE ABOVE GROUND DIESEL FUEL STORAGE TANK
  - 2 REMOVE EXISTING ANCHORS AND GRIND DOWN EXISTING ANCHOR BOLT TO CONCRETE SURFACE.
  - 3 SAW CUT AND REMOVE A 3 FOOT SECTION OF THE CONTAINMENT CURB AND REMOVE THE EXISTING DRAIN VALVE.
  - 4 EXISTING BOLLARDS TO REMAIN, PROTECT IN PLACE
  - 5 REMOVE EXISTING PIPING FROM ABOVE GROUND TANK TO DAY TANK
  - 6 PARTIALLY REMOVE EXISTING SUPPLY/RETURN PIPING FROM DAY TANK TO GENERATOR. DISCONNECT TO POINT OF CONNECTION FOR NEW LINES.
  - 7 REMOVE EXISTING 50 GALLON DAY TANK
  - 8 EXISTING TREE TO BE TRIMMED OR REMOVED BY EAST BAY MUD FACILITIES GROUP.

**UST ABANDON IN PLACE NOTES:**

- 9 EXISTING 1000 UNDERGROUND STORAGE TANK TO BE CLEANED AND ABANDONED IN PLACE PER THE REQUIREMENTS OF THE CONTRA COSTA COUNTY HEALTH DEPARTMENT AND CONTRA COSTA COUNTY FIRE DEPARTMENT REQUIREMENTS. EBMUD TO PROVIDE SOIL SAMPLING AND TESTING AS REQUIRED BY HEALTH DEPARTMENT CONDITIONS.
- 10 REMOVE EXISTING TANK MONITOR SYSTEM AT MAINTENANCE BUILDING. REMOVE ELECTRICAL CONDUIT AND CONDUCTORS BACK TO ELECTRICAL PANEL. REMOVE CIRCUIT AND PLACE BLANK IN ELECTRICAL PANEL.
- 11 REMOVE EXISTING UNDERGROUND STORAGE TANK FUEL FILL LINE AND SLURRY ANY UNDERGROUND SECTION OF PIPE THAT HAS TO REMAIN. SLURRY FILL EXISTING UNDERGROUND STORAGE TANK. REMOVE EXISTING UNDERGROUND STORAGE TANK RISER AND PATCH CONCRETE SIDEWALK AREA TO MATCH EXISTING.
- 12 SAWCUT, REMOVE AND DISPOSE OF EXISTING CONCRETE SIDEWALK AS REQUIRED BY NEW WORK. LOCATE EXISTING UNDERGROUND FUEL SUPPLY AND RETURN PIPING, REMOVE AND DISPOSE OF FUEL PIPING FROM UST SUMP TO EXISTING AST SLAB. CAP EXISTING LINE TO REMAIN. BACKFILL AND COMPACT TRENCH. REPLACE SIDEWALK TO MATCH EXISTING.



NO.	DATE	DESCRIPTION	REVISIONS
1	3-15-24	REVISED PER CLIENT COMMENTS	

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SHEET TITLE: DEMOLITION SITE PLAN

PROJECT ADDRESS:  
 EL SOBRANTE WATER TREATMENT PLANT  
 5500 AMEND RD  
 EL SOBRANTE, CA 94803

CLIENT: EBMUD  
 PLANT ENGINEERING SERVICES/CONSTRUCTION  
 315 11TH ST  
 OAKLAND, CA 94607

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 DRAWN BY: B. DUARTE  
 JOB NUMBER: T8094307  
 SHEET 2 OF 11

DATE: 1/26/24  
 SCALE: NOTED

D-1

BID SET 3/15/24

ABOVEGROUND TANK SYSTEM CLOSURE REQUIREMENTS

A. GENERAL INFORMATION

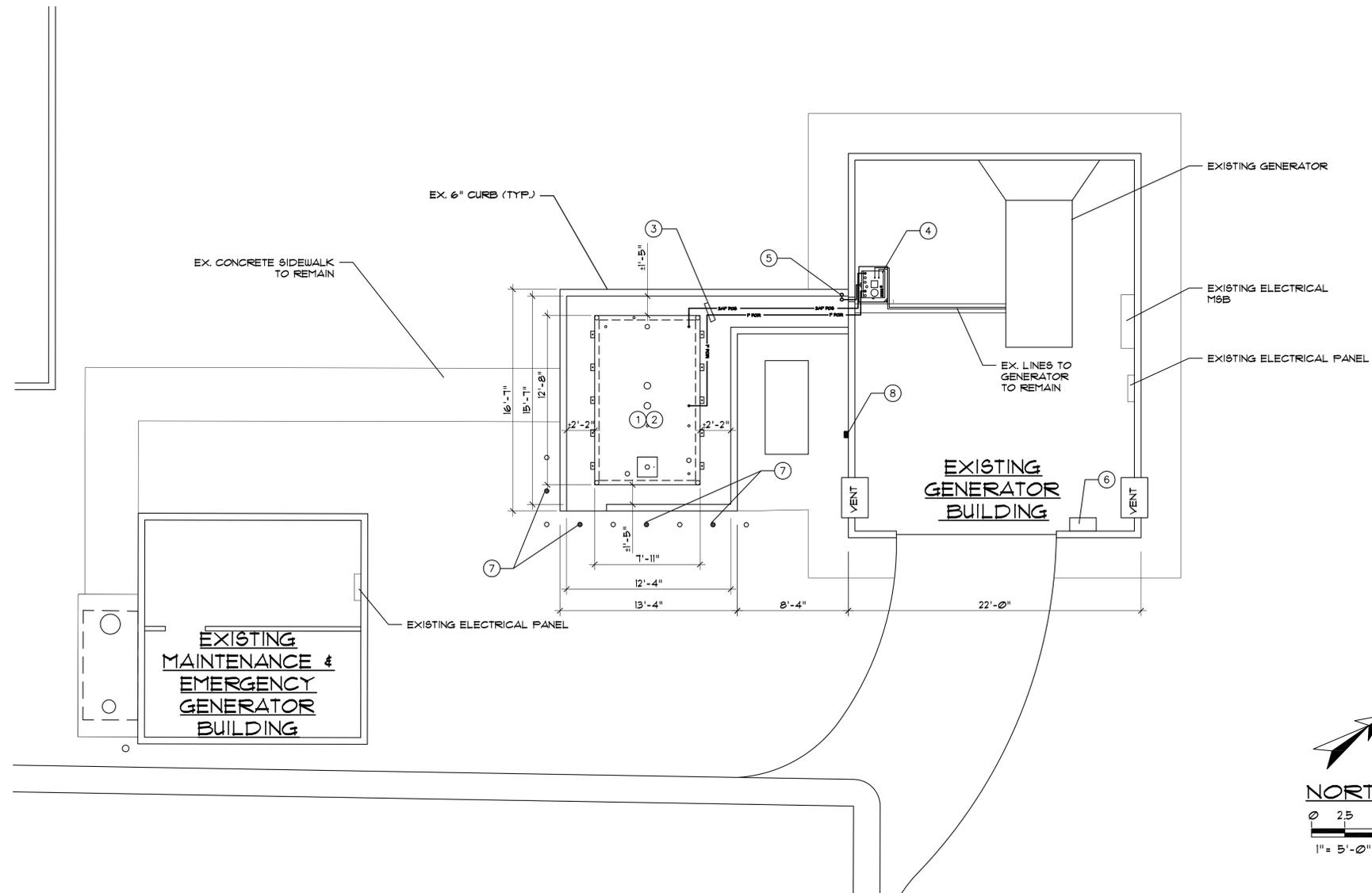
1. ABOVEGROUND STORAGE TANKS (AST) THAT HAVE CONTAINED A HAZARDOUS MATERIAL AND WHICH ARE NO LONGER IN SERVICE MUST BE CLOSED ACCORDING TO THESE REQUIREMENTS. RE-USE OF A TANK IS PERMITTED ONLY IF THE RE-USE IS COMPATIBLE WITH THE TANK AND IS APPROVED BY THE LOCAL AGENCY. RE-USE OF A TANK WHICH PREVIOUSLY HELD A HAZARDOUS MATERIAL FOR WATER STORAGE, FIRE SUPPRESSION, OR IRRIGATION IS NOT ALLOWED UNLESS THE TANK HAS BEEN CLEANED AND CERTIFIED AS NON-HAZARDOUS IN ACCORDANCE WITH CALIFORNIA CODE OF REGULATIONS, TITLE 22, DIVISION 4.5, CHAPTER 32 [REFER TO THE UNIDOC'S TANK SYSTEM ON-SITE CLEANING REQUIREMENTS (UN-065) GUIDANCE DOCUMENT FOR DETAILS]. IF RE-USE OF THE TANK REQUIRES MOVING THE TANK TO ANOTHER LOCATION IN OR OUT OF THE LOCAL JURISDICTION, THE LOCAL HAZARDOUS MATERIALS COMPLIANCE AGENCY HAVING JURISDICTION IN THE INTENDED DESTINATION MUST APPROVE THE USE OF THE TANK. CHECK WITH THE CALIFORNIA HIGHWAY PATROL REGARDING TRANSPORTATION REQUIREMENTS BEFORE MOVING ANY TANK.
2. A TANK CLOSURE PERMIT WILL BE ISSUED UPON APPROVAL OF AN ABOVEGROUND STORAGE TANK SYSTEM CLOSURE PERMIT APPLICATION (UN-064) BY THE LOCAL AGENCY HAVING RESPONSIBILITY FOR HAZARDOUS MATERIALS COMPLIANCE.
3. UPON SATISFACTORY REVIEW AND APPROVAL OF THE CLOSURE PERMIT APPLICATION BY THE LOCAL AGENCY, THE OWNER OF THE TANK SYSTEM SHALL CARRY OUT THE PROPOSED ACTIONS. UNLESS STATED OTHERWISE BY THE LOCAL AGENCY, TANK REMOVAL ACTIVITIES SHALL BE WITNESSED BY A REPRESENTATIVE FROM THE LOCAL AGENCY. CLOSURE INSPECTIONS MUST BE SCHEDULED AT LEAST TWO (2) WORKING DAYS IN ADVANCE.

B. TANK REMOVAL

1. UPON APPROVAL OF THE CLOSURE PERMIT APPLICATION, THE TANK OWNER/OPERATOR SHALL CARRY OUT THE PROPOSED ACTIONS. TANK REMOVAL AND SAMPLING ACTIVITIES (IF REQUIRED) MUST BE WITNESSED BY A REPRESENTATIVE OF THE LOCAL AGENCY.
2. TANK REMOVAL OR RELOCATION MAY COMMENCE ONLY AFTER THE LOCAL AGENCY HAS GIVEN APPROVAL.
3. HAZARDOUS MATERIALS SHALL BE REMOVED FROM TANKS AND PIPING PRIOR TO TANK REMOVAL AND MUST BE PROPERLY MANAGED. MATERIALS GENERATED AS THE RESULT OF THE RINSING OR DECONTAMINATION OF TANKS SHALL BE MANAGED AS HAZARDOUS WASTES UNLESS A WRITTEN HAZARDOUS WASTE DETERMINATION PER TITLE 22 CALIFORNIA CODE OF REGULATIONS §66262.11 DEMONSTRATES THAT THE WASTE IS NON-HAZARDOUS.
4. ALL PUMPS AND ASSOCIATED PIPING SHALL BE REMOVED.
5. THE PERSON REMOVING THE TANK(S) SHALL PROVIDE TANK REMOVAL/LIFTING EQUIPMENT OF A SIZE ADEQUATE TO SAFELY LIFT THE TANK(S) ONTO THE TRANSPORT VEHICLE WITHOUT DRAGGING THEM OR OTHERWISE CAUSING AN UNSAFE CONDITION.
6. FOR TANKS PREVIOUSLY CONTAINING FLAMMABLE/COMBUSTIBLE MATERIALS, THE PERSON CLOSING THE TANK(S) SHALL PROVIDE, ON-SITE AND READILY ACCESSIBLE, AT LEAST ONE 40BC RATED PORTABLE FIRE EXTINGUISHER AND A PROPERLY CALIBRATED METER CAPABLE OF MEASURING LEL (LOWER EXPLOSIVE LIMIT) AND OXYGEN LEVELS.
7. TANKS PREVIOUSLY CONTAINING FLAMMABLE/COMBUSTIBLE MATERIALS SHALL BE MADE SAFE FOR REMOVAL BY THE ADDITION OF DRY ICE (CARBON DIOXIDE) -- OR OTHER METHODS APPROVED BY THE LOCAL AGENCY -- SUFFICIENT TO ACHIEVE AN ATMOSPHERE OF EITHER LESS THAN 10% OXYGEN OR LESS THAN 20% LEL. (NOTE: AT A MINIMUM ADD 22.2 POUNDS OF DRY ICE PER EACH 1,000 GALLONS OF TANK VOLUME; HOWEVER, HIGHLY VOLATILE MATERIALS MAY REQUIRE MORE.)
8. THE PERSON CLOSING THE TANK(S) SHALL BE RESPONSIBLE FOR ENSURING THAT CONDITIONS AT THE SITE PROVIDE FOR WORKPLACE SAFETY, PROTECTION OF THE ENVIRONMENT, AND MAINTENANCE OF INTEGRITY OF NEARBY STRUCTURES.
9. ALL TANKS AND PIPING SHALL BE MANIFESTED AND HAULED BY A LICENSED HAZARDOUS WASTE TRANSPORTER TO A PERMITTED HAZARDOUS WASTE FACILITY, WHETHER OR NOT THEY HAVE BEEN RINSED ON SITE. [NOTE: THIS DOES NOT APPLY TO TANKS WHICH HAVE BEEN CLEANED ON-SITE AND CERTIFIED AS NON-HAZARDOUS IN ACCORDANCE WITH CALIFORNIA CODE OF REGULATIONS, TITLE 22, DIVISION 4.5, CHAPTER 32.]
10. IF SOIL SAMPLING IS REQUIRED BY THE LOCAL AGENCY, SAMPLING MUST BE COMPLETED BY AN APPROVED THIRD-PARTY. SOIL SAMPLES SHALL BE ANALYZED BY A LABORATORY STATE-CERTIFIED FOR THE REQUIRED ANALYSES AND HANDLED UNDER A CHAIN-OF-CUSTODY FORM. SAMPLE RESULTS WITHOUT A CHAIN-OF-CUSTODY FORM SHALL BE CONSIDERED INVALID AND RE-SAMPLING WILL BE REQUIRED.
11. IF CONTAMINATION OF ANY DETECTABLE CONCENTRATION IS FOUND, FURTHER SOIL AND GROUNDWATER INVESTIGATION MAY BE REQUIRED.
12. THE FOLLOWING INFORMATION SHALL BE SUBMITTED TO THE LOCAL AGENCY WITHIN 60 DAYS OF TANK REMOVAL: ANALYTICAL RESULTS FROM SAMPLES; COPY OF COMPLETED SAMPLE CHAIN(S)-OF-CUSTODY; SITE DRAWING(S) SHOWING TANK LOCATION(S), PIPELINE RUNS, SAMPLING LOCATIONS, AND SAMPLING DEPTHS; AND A PHOTOCOPY OF THE TSDF-SIGNED COPY OF EACH HAZARDOUS WASTE MANIFEST USED TO TRANSPORT TANKS, PIPING, TANK CONTENTS (IF MANAGED AS HAZARDOUS WASTE), AND RINSEATE.

C. SUMMARY OF REQUIREMENTS TO OBTAIN FINAL TANK SYSTEM CLOSURE

1. THE OPERATOR OF THE FACILITY AT WHICH THE TANK WAS LOCATED SHALL UPDATE THE FACILITY'S HAZARDOUS MATERIALS BUSINESS PLAN (HMBP) WITHIN 30 DAYS OF TANK REMOVAL BY ELECTRONICALLY SUBMITTING REVISED HAZARDOUS MATERIALS INVENTORY INFORMATION AND A REVISED STORAGE MAP VIA THE CALIFORNIA ENVIRONMENTAL REPORTING SYSTEM (CERS) AT CERS.CALEPA.CA.GOV OR THE LOCAL UNIFIED PROGRAM AGENCY (UPA) ELECTRONIC REPORTING PORTAL, IF APPLICABLE.
2. THE FOLLOWING INFORMATION SHALL BE SUBMITTED TO THE AGENCY OVERSEEING CLOSURE WITHIN 60 DAYS OF TANK REMOVAL: ANALYTICAL RESULTS FROM SAMPLES, SAMPLE CHAIN(S)-OF-CUSTODY, AND SITE DRAWINGS SHOWING TANK LOCATION(S), PIPELINE RUNS, SAMPLING LOCATIONS, AND SAMPLING DEPTHS (IF SAMPLING WAS REQUIRED); AND A COPY OF THE TSDF-SIGNED COPY OF ANY UNIFORM HAZARDOUS WASTE MANIFEST OR CONSOLIDATED MANIFEST USED TO TRANSPORT TANKS, PIPING, TANK CONTENTS, AND TANK/PIPING RINSEATE.



(XX) TANK INSTALLATION CONSTRUCTION NOTES

- ALL CONSTRUCTION IS EXISTING AND TO REMAIN UNLESS NOTED OTHERWISE. CONTRACTOR TO VERIFY FIELD CONDITIONS AND DIMENSIONS PRIOR TO START OF CONSTRUCTION.
1. INSTALL EAST BAY MUD SUPPLIED ABOVEGROUND 2000 GALLON ABOVE GROUND STORAGE TANK, SEE SHEET F-1 & F-2.
  2. ANCHOR TANK TO EXISTING CONCRETE SLAB PER DETAILS. NOTE: EPOXY COAT EXISTING CONCRETE SLAB PRIOR TO TANK INSTALLATION, SEE DETAIL 1/F-2.
  3. INSTALL NEW ABOVEGROUND PIPING FROM DAY TANK TO GENERATOR BUILDING INTERIOR CORE THROUGH EXISTING CONCRETE WALL AND PROVIDE PIPING TO DAY TANK CONNECTION, SEE DETAILS 2/F-2 AND 6/F-3.
  4. INSTALL NEW 50 GALLON DAY TANK WITH MANUFACTURER PROVIDED SUPPLY AND RETURN PUMPS AND CONTROLS. REFER TO ELECTRICAL PLANS FOR WIRING INSTALLATION.
  5. NEW AST VENT RISER THROUGH EXISTING CONCRETE WALL FOR NEW DAY EMERGENCY VENT, SIZE PER TANK MANUFACTURER, SEE DETAIL 6/F-2.
  6. INSTALL NEW VEEDER-ROOT TDS 450 MONITOR SYSTEM WITH ABOVE GROUND TANK AND DAY TANK SENSORS, MOUNT ON GENERATOR BUILDING STORAGE WALL AND CONNECT TO EXISTING ELECTRICAL PANEL. REFER TO ELECTRICAL PLANS.
  7. INSTALL FOUR NEW CONCRETE BOLLARDS BETWEEN EXISTING BOLLARDS AT FRONT OF TANK, SEE DETAILS 1/F-2 AND 4/F-3.
  8. INSTALL OVERFILL ALARM SWITCH AND SIGNS AS REQUIRED BY NEW WORK, SEE ELECTRICAL PLANS.



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<b>TAIT</b> Since 1964			
SHEET TITLE: OVERALL SITE PLAN			
PROJECT ADDRESS: EL SOBRANTE WATER TREATMENT PLANT 5500 AMEND RD EL SOBRANTE, CA 94803			
CLIENT: EBMUD PLANT ENGINEERING SERVICES/CONSTRUCTION 315 11TH ST OAKLAND, CA 94607			
CHECKED: B. DUREE DRAWN BY: B. DUARTE JOB NUMBER: T8894307			
DATE: 1/26/24	SHEET 3 OF 11		SCALE: NOTED
A-1			

BID SET 3/15/24

**VEEDER-ROOT TL6-450 PLUS SYSTEM COMPONENTS LIST:**

QUANTITY	DESCRIPTION
1	TL6-450 PLUS CONSOLE WITH PRINTER. 860091-302
1	TL6-450 APPLICATION SOFTWARE. 333545-001
1	UNIVERSAL SENSOR/PROBE INTERFACE MODULE (USM). 332812-001
1	UNIVERSAL INPUT/OUTPUT INTERFACE MODULE (UIOM). 332813-001
1	MAG PLUS INVENTORY ONLY PROBE, 4'-0" 846391-10X
1	MAG PROBE INSTALL KIT, 4" FLOAT (DIESEL). 846400-001
1	4" PROBE CAP & RING KIT. 312020-952
1	TANK INTERSTITIAL SENSOR. T94330-420
1	OVERFILL ALARM ACKNOWLEDGEMENT SWITCH. T90095-001
1	OVERFILL ALARM. T90091-001

**NOTE:**  
 PROGRAMMING PROTOCOL - LEVEL PROBE TO ALARM @ 90%.  
 VEEDER-ROOT SYSTEM SHALL BE INSTALLED BY A VEEDER-ROOT LEVEL 4 CERTIFIED ELECTRICIAN.  
 ALL VEEDER-ROOT PROBES AND SENSORS SHALL BE CONNECTED TO THE SYSTEM CONSOLE USING 14 AWG SHIELDED CABLE, BELDEN 88160 OR 88161.  
 CONTRACTOR TO PROVIDE REQUIRED ICC AND EQUIPMENT CERTIFICATION VERIFICATION FOR THE EMPLOYEES THAT WILL PERFORM THE TANK AND MONITOR INSTALLATION. THE CERTIFIED TECHNICIAN SHALL BE ONSITE DURING ALL INSTALLATION WORK.

**AST MATERIAL LIST - DETAIL 1/F-1**

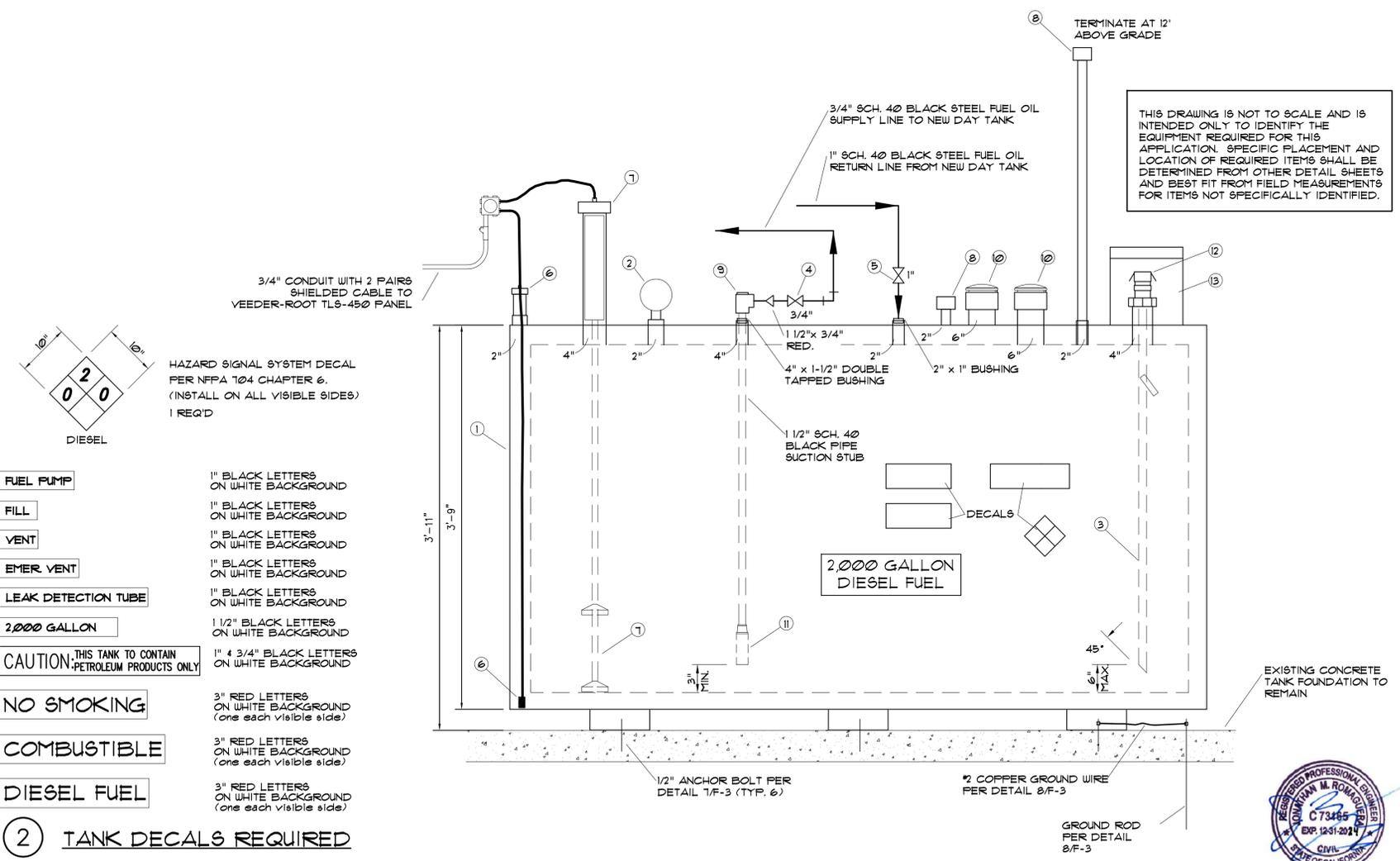
- ① 2000 GALLON RECTANGULAR DOUBLE WALL STEEL FIRE RATED MAIN TANK, UL 2085 CONSTRUCTION (SPARTAN TANK).
- ② MANUAL TANK LEVEL GAUGE, MORRISON CLOCK GAUGE 818F-0100AG (CONSPICUOUSLY MARK FACE OF GAUGE @ 85% TANK CAPACITY)
- ③ 2" OVERFILL PREVENTION VALVE MORRISON 9035C-0200AV AND DROP TUBE MORRISON 419--0200ITEVR (SET AT 90% TANK CAPACITY).
- ④ 3/4" BALL VALVE, JOMAR NJOM100-104.
- ⑤ 1" BALL VALVE, JOMAR NJOM100-105.
- ⑥ TANK ANNULAR SPACE SENSOR, VEEDER-ROOT T94330-420 AND 2" INTERSTITIAL RISER CAP & ADAPTOR KIT MORRISON 305XFA-2400AKEVR
- ⑦ TANK INVENTORY PROBE WITH 4" FLOAT INSTALL KIT AND PROBE RISER CAP & RING KIT, VEEDER-ROOT
- ⑧ 2" VENT CAP, MORRISON 354-0200AV
- ⑨ 1 1/2" ANTI-SIPHON VALVE (0'-5'), WITH PRESSURE RELIEF, MORRISON 910-1000AV
- ⑩ 6" EMERGENCY VENTS, (PROVIDED BY TANK MANUFACTURER)
- ⑪ 1-1/2" SUCTION STRAINER, MORRISON 934--1500AS
- ⑫ MORRISON 921--300AAEVR DRY DISCONNECT ADAPTOR WITH T35DC-4000ACEVR DUST CAP.
- ⑬ INTEGRAL 15-GALLON SPILL CONTAINMENT BOX WITH LOCKABLE LID AND 1/2" NPT DRAIN WITH BRASS "T" PLUG (PROVIDED BY TANK MANUFACTURER)

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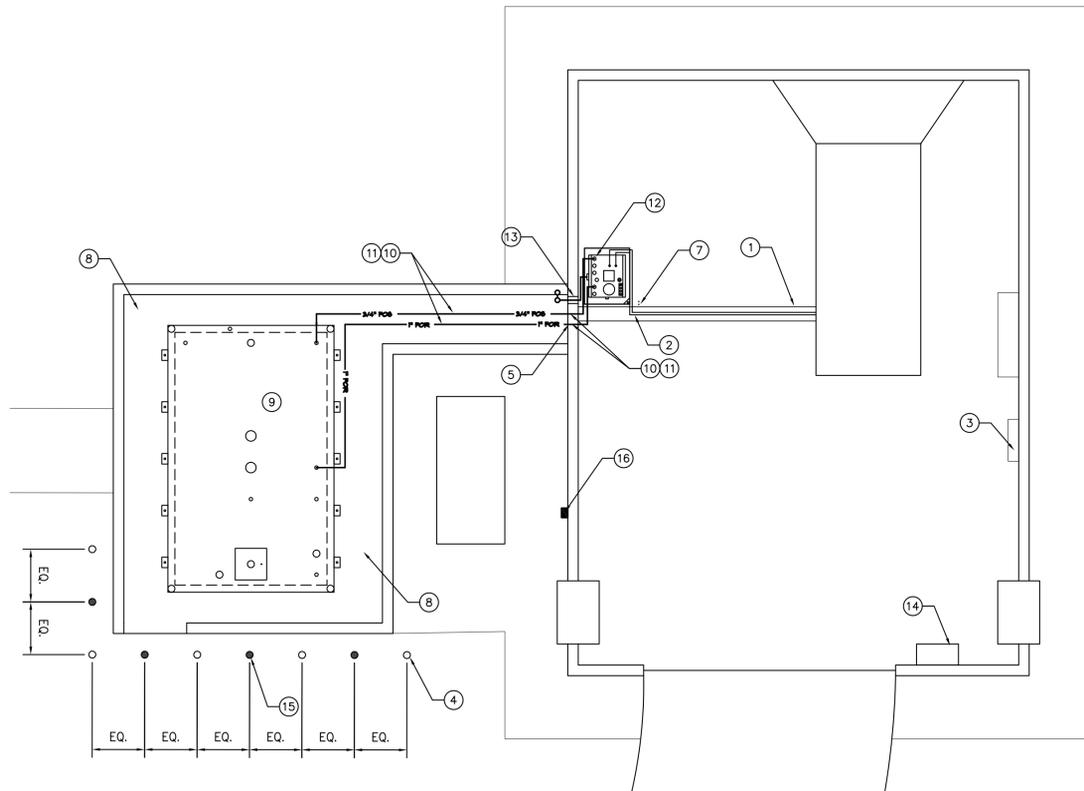


- |         |  |  |
|---------|--|--|
| 1 REQ'D | <b>FUEL PUMP</b>   | 1" BLACK LETTERS ON WHITE BACKGROUND                       |
| 1 REQ'D | <b>FILL</b>  | 1" BLACK LETTERS ON WHITE BACKGROUND                       |
| 1 REQ'D | <b>VENT</b>  | 1" BLACK LETTERS ON WHITE BACKGROUND                       |
| 2 REQ'D | <b>EMER VENT</b>   | 1" BLACK LETTERS ON WHITE BACKGROUND                       |
| 1 REQ'D | <b>LEAK DETECTION TUBE</b>                                   | 1" BLACK LETTERS ON WHITE BACKGROUND                       |
| 1 REQ'D | <b>2,000 GALLON</b>  | 1 1/2" BLACK LETTERS ON WHITE BACKGROUND                   |
| 1 REQ'D | <b>CAUTION: THIS TANK TO CONTAIN PETROLEUM PRODUCTS ONLY</b> | 1" & 3/4" BLACK LETTERS ON WHITE BACKGROUND                |
| 1 REQ'D | <b>NO SMOKING</b>  | 3" RED LETTERS ON WHITE BACKGROUND (one each visible side) |
| 1 REQ'D | <b>COMBUSTIBLE</b>   | 3" RED LETTERS ON WHITE BACKGROUND (one each visible side) |
| 1 REQ'D | <b>DIESEL FUEL</b>   | 3" RED LETTERS ON WHITE BACKGROUND (one each visible side) |
- ② TANK DECALS REQUIRED

① 2,000 GALLON DIESEL FUEL TANK UL2085 SCHEMATIC EQUIPMENT & PIPING INSTALLATION  
 NOT TO SCALE

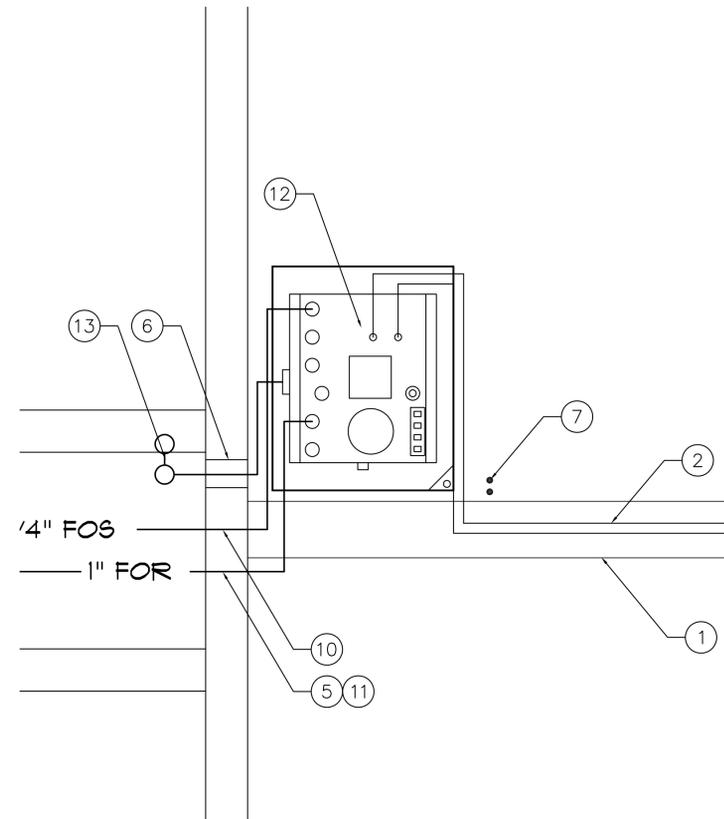
SHEET TITLE	2,000 GALLON AST INSTALLATION DETAIL
PROJECT ADDRESS	EL SOBRANTE WATER TREATMENT PLANT 5500 AMEND RD EL SOBRANTE, CA 94803
CLIENT	EBMUD PLANT ENGINEERING SERVICES/CONSTRUCTION 315 11TH ST OAKLAND, CA 94607
CHECKED	B. DUREE
DRAWN BY	B. DUARTE
JOB NUMBER	T8094307
DATE	1/26/24
SHEET	4 OF 11
SCALE	F-1
NOTED	





1 AST & PIPING INSTALLATION PLAN

SCALE: 1/4" = 1'-0"



2 DAY-TANK PIPING INSTALLATION PLAN

SCALE: 1" = 1'-0"

## XX TANK INSTALLATION CONSTRUCTION NOTES

- ALL CONSTRUCTION IS EXISTING AND TO REMAIN UNLESS NOTED OTHERWISE. CONTRACTOR TO VERIFY FIELD CONDITIONS AND DIMENSIONS PRIOR TO START OF CONSTRUCTION.
- 1 EXISTING PIPE TRENCH WITH METAL COVER PLATE TO REMAIN.
  - 2 EXISTING FUEL SUPPLY AND RETURN PIPING TO REMAIN, PROTECT IN PLACE, MODIFY PIPING AS REQUIRED TO ACCOMMODATE NEW DAY-TANK INSTALLATION.
  - 3 EXISTING ELECTRICAL PANEL.
  - 4 EXISTING PIPE BOLLARD, TYPICAL OF 5.
  - 5 EXISTING CORE DRILL FOR FUEL RETURN LINE TO REMAIN FOR REUSE.
  - 6 EXISTING 4" CORE DRILL FOR TANK VENT LINE TO REMAIN.
  - 7 EXISTING ELECTRICAL CONDUIT RISERS AND J-BOX TO REMAIN.
  - 8 EXISTING CONCRETE SLAB, PATCH/REPAIR CONCRETE SURFACE AS REQUIRED BY NEW WORK. PROVIDE AND INSTALL EPOXY SEALANT PRIOR TO START OF CONSTRUCTION.
  - 9 INSTALL EAST BAY MUD SUPPLIED 2,000 GALLON ABOVEGROUND FUEL STORAGE TANK. SEE SHEET F-2 & DETAIL 3/F-3. ANCHOR TANK TO EXISTING CONCRETE SLAB PER DETAIL 1/F-3.
  - 10 INSTALL NEW ABOVEGROUND FUEL SUPPLY PIPING FROM AST TO DAY-TANK. CORE THROUGH EXISTING CONCRETE WALL FOR FUEL SUPPLY PIPING. COMPLETE PIPING CONNECTION TO DAY-TANK CONNECTION, SEE DETAIL 2/F-3.
  - 11 INSTALL NEW ABOVEGROUND FUEL RETURN PIPING FROM AST TO DAY-TANK THROUGH EXISTING WALL CORE. COMPLETE PIPING CONNECTION TO DAY-TANK, SEE DETAIL 2/F-3.
  - 12 INSTALL NEW 50 GALLON DAY-TANK WITH MANUFACTURER PROVIDED SUPPLY AND RETURN PUMPS AND CONTROLS, AND RUPTURE BASIN. REFER TO ELECTRICAL PLANS FOR WIRING INSTALLATION.
  - 13 EXTEND NEW TANK VENT PIPING THROUGH EXISTING CONCRETE WALL CORE FOR NEW DAY-TANK EMERGENCY VENT. SEE DETAIL 6/F-3.
  - 14 INSTALL NEW VEEDER-ROOT TLS 450 MONITOR SYSTEM WITH ABOVEGROUND TANK AND DAY-TANK SENSORS. MOUNT ON GENERATOR BUILDING STORAGE WALL, AND CONNECT TO EXISTING ELECTRICAL PANEL. REFER TO ELECTRICAL PLANS.
  - 15 INSTALL FOUR NEW CONCRETE BOLLARDS BETWEEN EXISTING BOLLARDS, TYPICAL OF 4, SEE DETAIL 4/F-3.
  - 16 COORDINATE INSTALLATION OF OVERFILL ALARM, SEE ELECTRICAL DRAWINGS.

## DAY-TANK EQUIPMENT LIST

- IPY50ULFY50UL - DAY TANK - STANDARD - 50 GAL, U/L LISTED CONTROL VOLTAGE - 120VAC DRY CONTACTS, THIS TANK FOR INDOOR USE ONLY. SUPPLY AND RETURN FUEL SYSTEM INCLUDES:
- (201) ALARM, COMBINATION - HIGH / LOW FUEL LEVEL.
  - (211) ALARM RELAY - FOR REMOTE SIGNAL OF OPTION #210
  - (322A) VENT KIT W/CAP(S) & FITTING(S) - SINGLE WALL - 2" NPT.
  - (334-3) COVER NEMA-1 - TRIPLEX PUMPS AND MOTORS.
  - (355A) CHECK VALVE - PUMP INTAKE, 1/2" NPT, (RETURN).
  - (360A-120) SOLENOID VALVE - N/C - 1/2" NPT, 120VAC, (SUPPLY).
  - (385/04) RUPTURE BASIN - 150% TANK CAPACITY, 50 GAL.
  - (395) LEAK DETECTOR - RUPTURE BASIN - ALARM & P/M SHUT DOWN (REMOTE CONTACTS).
  - (399-1-05) REVERSE FLOW CONTROLS & PIPING - 1/2" PLUMBING.
  - (401V-REV) PUMP - CAST IRON - 4 GPM - REVERSE FLOW.
  - (414) MOTOR - 1 PHASE - 1/3 HP, 115VAC, 60 HZ (SUPPLY).
  - (421AV-05) DUPLEX PMP, MOTOR, CONTROLS & PIPING - AUTO TRANSFER SWITCH, 1/2" PIPING.
  - (463V) PUMP & MOTOR - 2GPM - CAST IRON PUMP & 1/3 HP, 115VAC, 60 HZ MOTOR (SUPPLY).
  - (544) ENCLOSURE - CONTROL PANEL, NEMA-1

NO.	DATE	DESCRIPTION
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---	--

PROJECT TITLE 2,000 GALLON AST & DAY-TANK INSTALLATION DETAIL	PROJECT ADDRESS EL SOBRANTE WATER TREATMENT PLANT 5500 AMEND RD EL SOBRANTE, CA 94803
---	--

CLIENT EBMUD PLANT ENGINEERING SERVICES/CONSTRUCTION 315 11TH ST OAKLAND, CA 94607	CHECKED B. DUREE
	DRAWN BY B. DUARTE
	JOB NUMBER T6894307
DATE 1/26/24	SHEET 5 OF 11
SCALE NOTED	F-2



BID SET 3/15/24

**GENERAL NOTES**

ALL CONDUITS TO HAVE SEAL-OFFS PER LATEST EDITION OF THE NATIONAL ELECTRIC CODE, AND WHERE SHOWN.

ALL J-BOXES TO BE EXPLOSION PROOF. ORIENT ALL J-BOXES SUCH THAT THE SCREW LID IS ACCESSIBLE.

USE CABLE CONNECTOR FITTINGS (CROUSE-HINDS OR EQUIVALENT) AT MONITOR AND LEVEL GAUGE CABLE CONNECTIONS TO J-BOXES AND PIPE FITTINGS.

ALL UNDERGROUND CONDUITS TO BE PVC COATED RIGID. ALL ABOVEGROUND CONDUITS, INDOORS, TO BE GALVANIZED EMT WITH COMPRESSION FITTINGS. ALL ABOVEGROUND CONDUITS, OUTDOORS TO BE GALVANIZED RIGID WITH THREADED FITTINGS.

ALL EQUIPMENT, HARDWARE AND SYSTEM COMPONENTS MUST BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS.

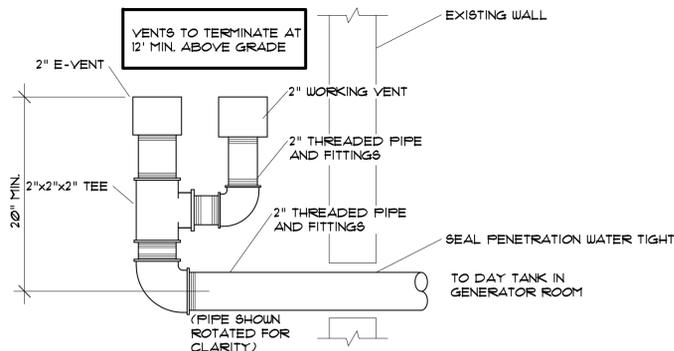
ALL PRIMARY STEEL PIPE TO BE ASTM A-53 SCHEDULE 40 BLACK STEEL PIPE.

THREADED FITTINGS TO BE ASTM A 105, 2000# FS.

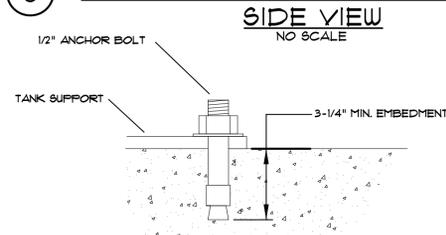
PROVIDE ALL APPROPRIATE SIGNAGE AS REQUIRED BY THE LATEST EDITION OF THE INTERNATIONAL FIRE CODE AND NFPA 30 & 30A.

SUPPORT PIPING AND CONDUITS WITH UNISTRUT AS REQUIRED.

CONTRACTOR TO PERFORM ALL REQUIRED PIPING SYSTEM TESTS. TEST PIPING TO 50 PSI FOR 30 MINUTES AND SOAP ALL JOINTS.



**6 EMERGENCY VENT PIPING DETAIL**

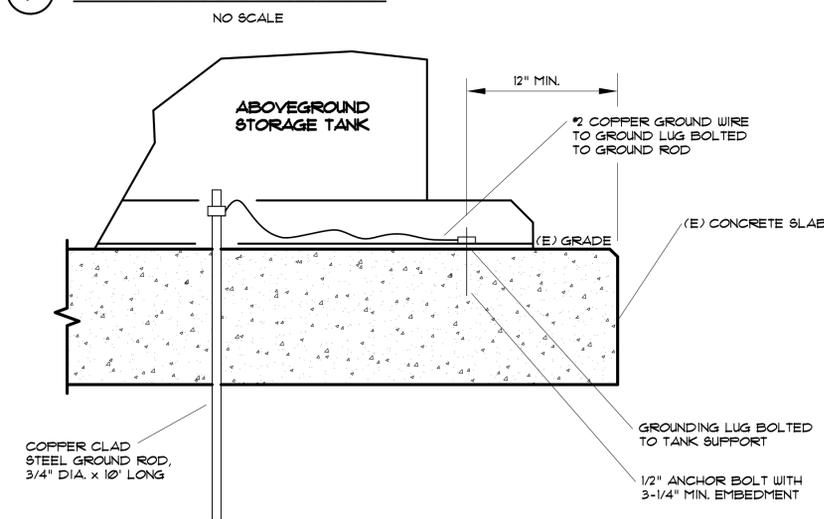


CONTRACTOR TO COORDINATE AND PROVIDE SPECIAL INSPECTIONS AND REPORTS REQUIRED BY THE BUILDING DEPARTMENT FOR THE POST INSTALLED CONCRETE ANCHORS.

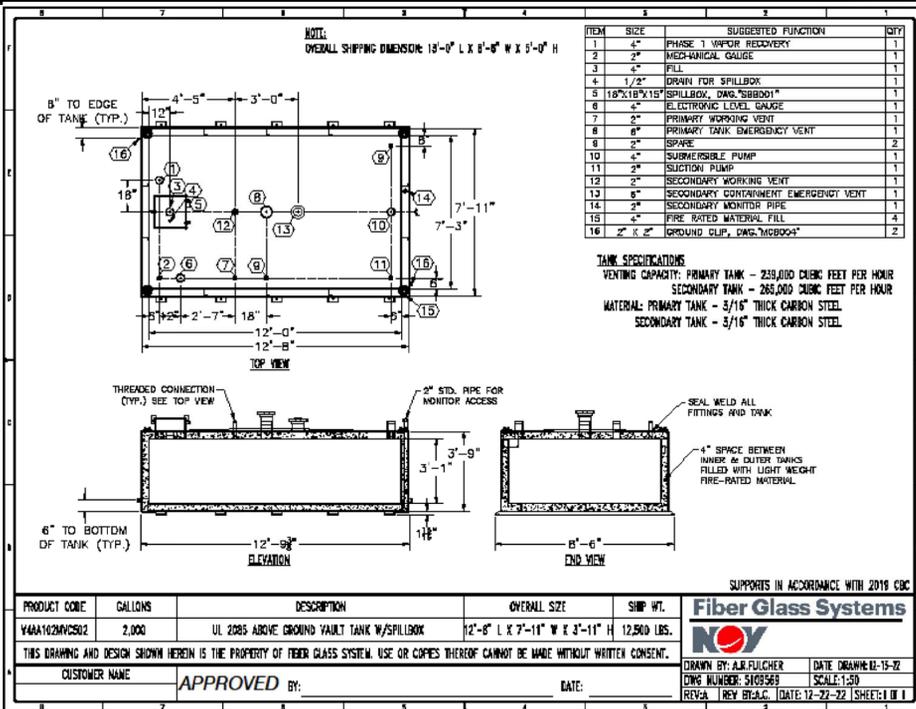
SEISMIC RESTRAINTS AND ANCHORAGE ARE DESIGNED FOR SITE CLASS D\* 4 PARAMETERS IN ACCORDANCE WITH 2022 CBC SECTION 1613.32

ANCHOR BOLT SIZES ARE BASED ON HILTI KWIK BOLT KBI CARBON STEEL FASTENERS IN ACCORDANCE WITH IAMPO EVALUATION REPORT NO. EBR-6781. SPECIAL INSPECTION REQUIRED IN ACCORDANCE WITH SECTION 1705.11 & TABLE 1705.3 OF THE IBC.

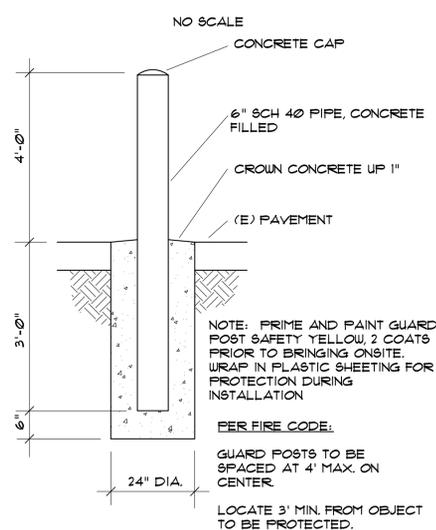
**7 ANCHOR BOLT DETAIL**



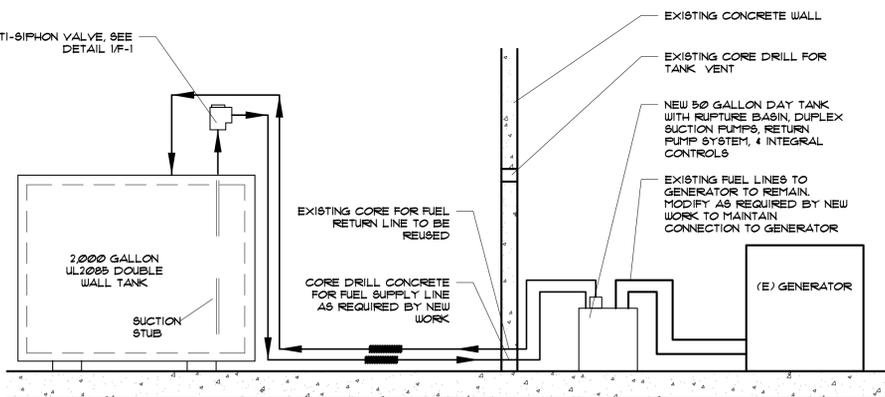
**8 ABOVEGROUND STORAGE TANK FOUNDATION SLAB GROUNDING DETAIL**



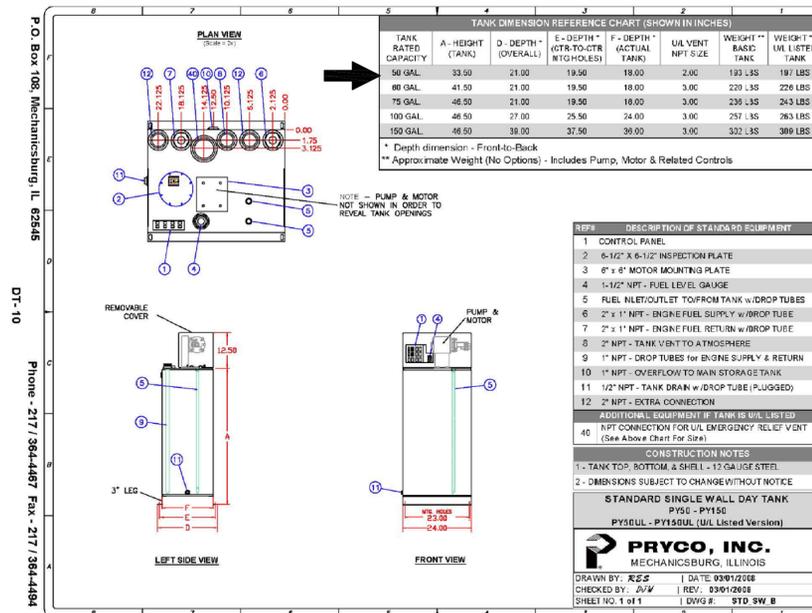
**3 UL2085 ABOVEGROUND STORAGE TANK**



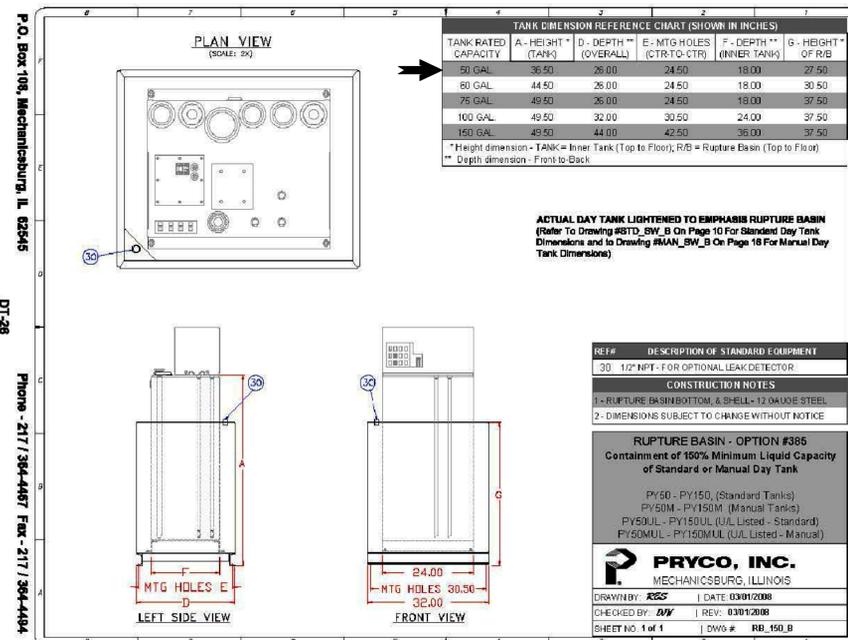
**4 4" GUARD POST DETAIL**



**5 SIMPLIFIED PIPE SCHEMATIC - DIESEL FUEL**



**1 50 GALLON DAY TANK CUT SHEET**



**2 50 GALLON DAY TANK RUPTURE BASIN**

Standard Single Wall Day Tank - PY50 thru PY150

150% Rupture Basins For Standard & Manual Day Tanks With 50 To 150 Gallons Capacity

NO.	DATE	DESCRIPTION	REVISIONS
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MISCELLANEOUS DETAILS

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EL SOBRANTE WATER TREATMENT PLANT  
5500 AMEND RD  
EL SOBRANTE, CA 94803

CLIENT  
EBMUD  
PLANT ENGINEERING SERVICES/CONSTRUCTION  
3715 11TH ST  
OAKLAND, CA 94607

CHECKED BY B. DUREE  
DRAWN BY B. DUARTE  
JOB NUMBER T8894307  
SHEET 6 OF 11  
DATE 1/26/24  
SCALE NOTED



BID SET 3/15/24

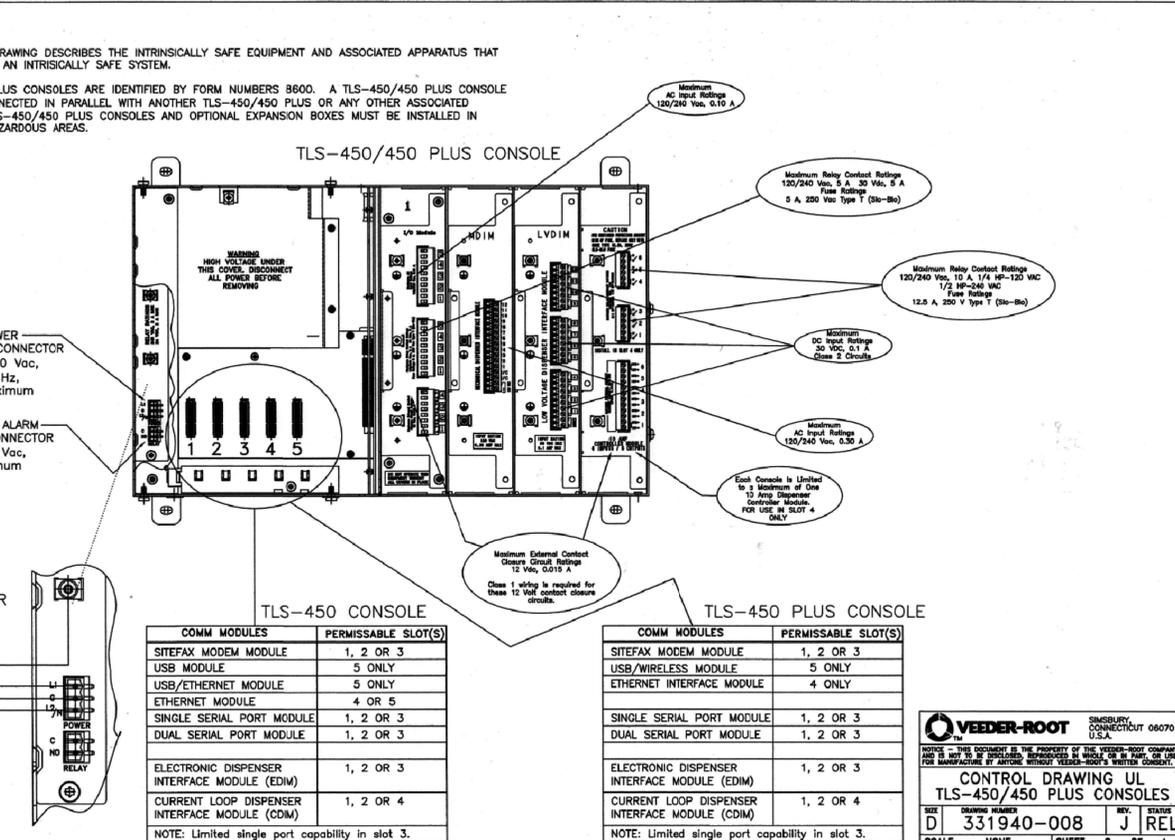
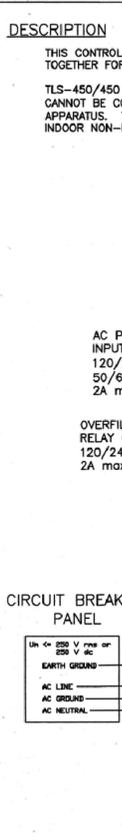
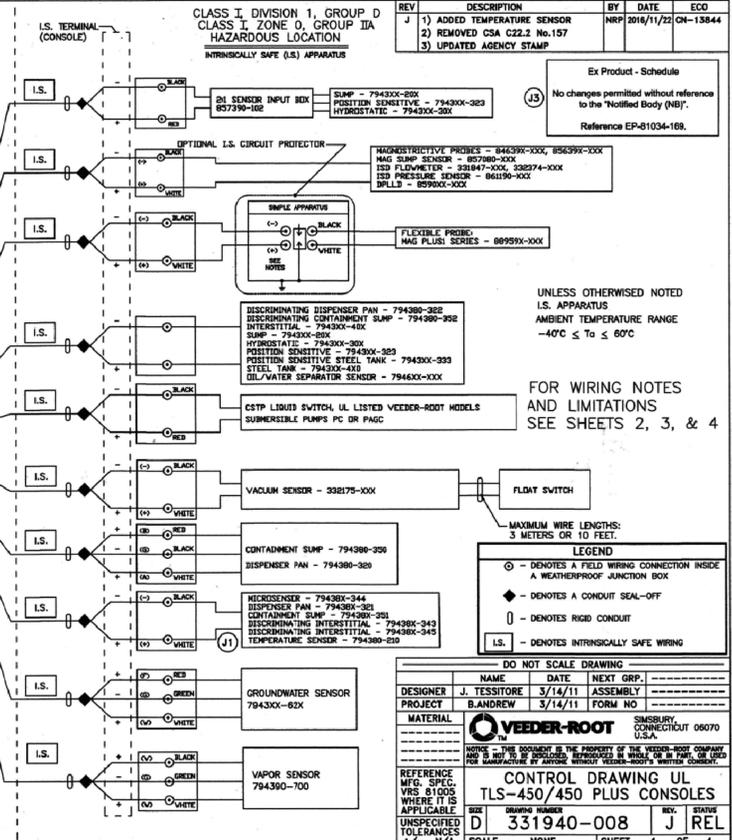
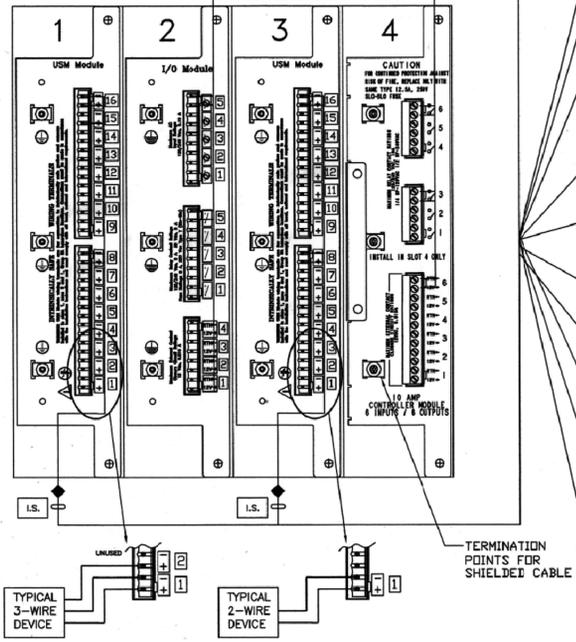
**CONTROL DRAWING  
INTRINSICALLY SAFE SYSTEM**

NON-HAZARDOUS LOCATION

ASSOCIATED APPARATUS

TLS-450/450 PLUS CONSOLE

0°C ≤ T<sub>a</sub> ≤ 40°C



**WARNINGS**  
SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

**WIRING NOTES**  
INTRINSICALLY SAFE (I.S.) WIRING MUST BE INSTALLED IN ACCORDANCE WITH ARTICLE 504-20 OF THE NEC (NATIONAL ELECTRICAL CODE), ANSI/NFPA 70 OR OTHER APPLICABLE LOCAL CODES. ALL OTHER WIRING MUST BE INSTALLED ACCORDING TO LOCAL CODES.

THE MAXIMUM CABLE LENGTH ALLOWED, USED TO CONNECT ANY INTRINSICALLY SAFE DEVICE TO THE TLS-450/450 PLUS CONSOLE IS LIMITED TO A TOTAL OF 24,000 FEET PER USM (UNIVERSAL SENSOR MODULE).

EACH CABLE (OR I.S. WIRING) USED TO CONNECT INTRINSICALLY SAFE DEVICES TO THE TLS-450/450 PLUS CONSOLE, MUST BE RATED 100 PF/FOOT (OR LESS CAPACITANCE PER FOOT) AND MUST BE RATED 0.2 μH/FOOT (OR LESS INDUCTANCE PER FOOT).

I.S. GROUNDING POINTS MUST BE CONNECTED TO A SUITABLE GROUND ELECTRODE THROUGH LESS THAN ONE OHM DC RESISTANCE TO THE EARTH GROUND BUS AT THE DISTRIBUTION PANEL IN ACCORDANCE WITH THE NEC/CEC OR OTHER LOCAL CODES.

CABLES (OR I.S. WIRING) USED TO CONNECT SEPARATE I.S. DEVICES TO THE ASSOCIATED APPARATUS MUST HAVE SUITABLE INSULATION AS REQUIRED BY ARTICLE 504.30(B) OF THE NEC.

ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE TO THIS CONTROL DRAWING AND ARTICLE 504 OF THE NEC OR SECTION 18 OF THE CEC.

THE MAXIMUM SAFE AREA VOLTAGE (U<sub>m</sub>) OF THIS EQUIPMENT IS 250V RMS OR DC. PERIPHERAL EQUIPMENT CONNECTED TO THE TLS-450/450 PLUS CONSOLE MUST NOT USE OR GENERATE MORE THAN 250V RMS OR DC WITH RESPECT TO EARTH GROUND.

INSIDE THE MODULE AREA OF BOTH THE TLS-450/450 PLUS CONSOLE, ANY COMBINATION OF UP TO FOUR MODULES MAY BE INSTALLED. MDIM, LVDIM AND I/O MODULES PROVIDE WIRING TERMINALS FOR THE CONNECTION OF EQUIPMENT INSTALLED IN NON-HAZARDOUS LOCATIONS. THE USM (UNIVERSAL SENSOR MODULE) PROVIDES WIRING TERMINALS FOR THE CONNECTION OF INTRINSICALLY SAFE APPARATUS.

THE ELECTRONICS LOCATED IN THE BARRIER CIRCUIT OF THE USM MODULE FORMS AN INTRINSICALLY SAFE ENERGY LIMITED SYSTEM. PROBE AND SENSORS CONNECTED TO THE OUTPUT TERMINALS OF THE USM MODULE ARE CONSIDERED INTRINSICALLY SAFE APPARATUS AND ARE APPROVED FOR USE IN CLASS I, GROUP D OR CLASS I ZONE 0 GROUP IIA HAZARDOUS (CLASSIFIED) LOCATIONS.

**LIMITATIONS**  
A MAXIMUM OF 2 TLS RF CONSOLES AND UP TO 16 INTRINSICALLY SAFE DEVICES MAY BE CONNECTED TO THE USM MODULE LOCATED IN A TLS-450/450 PLUS CONSOLE.

MAGNETOSTRICTIVE PROBE - ENCLOSURE CONTAINS ALUMINUM. CARE MUST BE TAKEN TO AVOID IGNITION HAZARD DUE TO IMPACT OR FRICTION.

VAPOR FLOW METERS, PART NUMBERS 331847-001 AND 332374-001 ARE ONLY SUITABLE FOR USE INSIDE THE BASE OF A FLAMMABLE LIQUID DISPENSER WHEN FACTORY INSTALLED BY THE RESPECTIVE ORIGINAL EQUIPMENT MANUFACTURER.

VAPOR FLOW METERS, PART NUMBERS 331847-002 AND 332374-002 ARE SUITABLE FOR IN-THE-FIELD INSTALLATIONS, WHEN MOUNTED INSIDE FLAMMABLE LIQUID DISPENSERS THAT ARE EVALUATED AS A PART OF A LISTED BY REPORT RETROFIT KIT.

LISTED VAPOR PRESSURE SENSORS, PART NUMBERS 861190-001, 861190-002 AND 861190-003 ARE SUITABLE FOR USE INSIDE THE BASE OF A FLAMMABLE LIQUID DISPENSER WHEN INSTALLED BY THE RESPECTIVE ORIGINAL EQUIPMENT MANUFACTURER. VAPOR PRESSURE SENSORS, PART NUMBERS 861190-001, 861190-002 AND 861190-003 ARE ALSO SUITABLE FOR USE WHEN MOUNTED TO THE VAPOR VENT STACK THAT IS USED FOR VENTING FLAMMABLE VAPORS.

VAPOR PRESSURE SENSORS, PART NUMBER 861190-001, 861190-002 AND 861190-003 ARE SUITABLE FOR IN-THE-FIELD INSTALLATIONS, WHEN MOUNTED INSIDE FLAMMABLE LIQUID DISPENSERS THAT ARE EVALUATED AS A PART OF A LISTED BY REPORT RETROFIT KIT.

IN SLOT 4 ONLY, ONE AND ONLY ONE 10 AMP CONTROLLER MODULE MAY BE INSTALLED IN A TLS-450/TLS-450PLUS CONSOLE. TLS-450/TLS-450PLUS CONSOLES WITHOUT A 10 AMP CONTROLLER MODULE, MAY USE ANY OTHER MODULE TYPE IN SLOT 4.

**I.S. CIRCUIT PROTECTION**  
CONSULT THE LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLING ANY SURGE PROTECTION DEVICES. SOME INSTALLATIONS MAY REQUIRE A 5 FOOT SPACING DISTANCE BETWEEN SURGE PROTECTOR AND ANY TANK ACCESS POINT OR VENT. REFERENCE NFPA 30.

THE INTRINSICALLY SAFE (I.S.) CIRCUIT PROTECTOR MUST BE A SIMPLE APPARATUS ONLY (NFPA 70, CLAUSE 504.2) SUITABLE TO THE AUTHORITY HAVING JURISDICTION.

**DESCRIPTION**  
THIS CONTROL DRAWING DESCRIBES THE INTRINSICALLY SAFE EQUIPMENT AND ASSOCIATED APPARATUS THAT TOGETHER FORM AN INTRINSICALLY SAFE SYSTEM.

TLS-450/450 PLUS CONSOLES ARE IDENTIFIED BY FORM NUMBERS 8600. A TLS-450/450 PLUS CONSOLE CANNOT BE CONNECTED IN PARALLEL WITH ANOTHER TLS-450/450 PLUS OR ANY OTHER ASSOCIATED APPARATUS. TLS-450/450 PLUS CONSOLES AND OPTIONAL EXPANSION BOXES MUST BE INSTALLED IN INDOOR NON-HAZARDOUS AREAS.

**LEGEND**  
○ - DENOTES A FIELD WIRING CONNECTION INSIDE A WEATHERPROOF JUNCTION BOX  
◆ - DENOTES A CONDUIT SEAL-OFF  
□ - DENOTES RIGID CONDUIT  
I.S. - DENOTES INTRINSICALLY SAFE WIRING

**DO NOT SCALE DRAWING**

NAME	DATE	NEXT CRP.
DESIGNER J. TESSITORE	3/14/11	ASSEMBLY
PROJECT B. ANDREW	3/14/11	FORM NO.

**VEEDER-ROOT** SENSORS, CONNECTICUT 06070 U.S.A.

CONTROL DRAWING UL  
TLS-450/450 PLUS CONSOLES

SIZE D 331940-008 REV. J REL

SCALE NONE SHEET 1 OF 4

**WARNING:** IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH ALL ELECTRICAL CODES. IN ADDITION, TURN OFF POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

**WARNING:** DISCONNECT ALL POWER BEFORE MAKING ANY CONNECTIONS TO PREVENT DEATH, SERIOUS INJURY, EXPLOSION, OR ELECTRICAL SHOCK. CONSOLE MUST NEVER BE OPERATED UNLESS THE FRONT COVER IS CLOSED OVER THE BARRIER TERMINALS IN THE INTRINSICALLY SAFE AREA.

**VEEDER-ROOT** SENSORS, CONNECTICUT 06070 U.S.A.

CONTROL DRAWING UL  
TLS-450/450 PLUS CONSOLES

SIZE D 331940-008 REV. J REL

SCALE NONE SHEET 3 OF 4

**VEEDER-ROOT** SENSORS, CONNECTICUT 06070 U.S.A.

CONTROL DRAWING UL  
TLS-450/450 PLUS CONSOLES

SIZE D 331940-008 REV. J REL

SCALE NONE SHEET 4 OF 4

**NOTE:**  
UTILIZE STANDARD DETAILS HEREON AS APPLICABLE TO THIS PROJECT

REVISIONS

NO.	DATE	DESCRIPTION
1	3-15-24	REVISED PER CLIENT COMMENTS

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**TAIT**

SHEET TITLE  
VEEDER-ROOT DIAGRAMS

PROJECT ADDRESS  
EL SOBRANTE WATER TREATMENT PLANT  
5500 AMEND RD  
EL SOBRANTE, CA 94803

CLIENT  
EBMUD  
PLANT ENGINEERING SERVICES/CONSTRUCTION  
315 11TH ST  
OAKLAND, CA 94607

CHECKED BY B. DUREE

DRAWN BY B. DUARTE

JOB NUMBER  
T8894307

SHEET 7 OF 11

DATE 1/26/24

F-4

SCALE NOTED

BID SET 3/15/24



# GENERAL NOTES

- THIS CONTRACTOR SHALL SUPPLY POWER TO AND MAKE CONNECTION TO ALL MOTORS AND EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS AS SHOWN ON THE MECHANICAL AND PLUMBING DRAWINGS, INCLUDING ALL FRACTIONAL HORSEPOWER MOTORS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE MECHANICAL AND PLUMBING DRAWINGS FOR DUCTS, LINES AND EQUIPMENT.
- ALL FUELING CONTROLS SHALL BE COORDINATED WITH THE FUEL EQUIPMENT INSTALLER PER THE MANUFACTURERS RECOMMENDATIONS PRIOR TO ROUGH-IN AND INSTALLATION OF ANY AND ALL FUEL CONTROL SYSTEMS DEVICES AND RELATED CONDUIT AND WIRE.
- THE CONTRACTOR SHALL SECURE AND PAY FOR PERMITS AND FEES NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK INCLUDING ALL CHARGES BY THE LOCAL GOVERNMENT AGENCIES AND THE UTILITY COMPANIES.
- UNLESS OTHERWISE NOTED, MOUNTING HEIGHTS INDICATED ON ELECTRICAL OUTLETS ARE FROM FINISHED FLOOR TO CENTER OF OUTLETS.
- NO CONDUIT SHALL BE RUN HORIZONTALLY IN CONCRETE FLOOR SLABS.
- ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT SHALL BE MADE BY THE CONTRACTOR.
- MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE COMPLETE SET OF APPROVED CONSTRUCTION DOCUMENTS, WHERE NO DETAIL IS INDICATED. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2019 CBC, SECTIONS 1615A.1.12 THROUGH 1615A.1.22 AND ASCE 7-05 CHAPTER 6 AND 13.

- ALL PERMANENT EQUIPMENT AND COMPONENTS.
- TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARDWIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
- MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

THE ATTACHMENT OF THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.

- COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORTS THE COMPONENT.
- COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

## PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-05 SECTION 13.3 AS DEFINED IN ASCE 7-05 SECTION 13.6.8, 13.6.7, 13.6.5.6 AND 2016 CBC, SECTIONS 1615A.1.20, 1615A.1.21 AND 1615A.1.22.

COPIES OF THE MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF HANGING AND BRACING OF THE PIPE, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS.

THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

- SHUTDOWN OF EXISTING ELECTRICAL SYSTEMS SERVING THE REST OF THE PROJECT SITE WILL NOT BE ALLOWED.
- THIS CONTRACTOR SHALL COORDINATE ALL LINE AND LOW VOLTAGE COMPONENTS AND WIRING TYPES TO, MATCH EXISTING SYSTEMS, WITH THE BUILDING OWNER PRIOR TO BID AND INCLUDE ALL COSTS FOR A COMPLETE OPERABLE SYSTEM EXPANSION.
- ALL EXPOSED CONDUIT SHALL BE PAINTED TO MATCH EXISTING FINISH.
- THE NUMERAL(S) SHOWN AT TOP LIGHT FIXTURE IDENTIFICATION SYMBOL WHICH INDICATES NUMBER OF LIGHT FIXTURES REQUIRED SHALL NOT BE USED BY THE CONTRACTOR FOR HIS QUANTITY TAKE-OFF AT BIDDING OR FOR DETERMINATION OF HOW MANY FIXTURES WILL BE INSTALLED. THE CONTRACTOR SHALL INSTALL A LIGHT FIXTURE WHEREVER A FIXTURE OUTLET IS SHOWN ON DRAWINGS.
- IDENTIFICATION NAMEPLATES FOR PANELS AND SWITCHBOARDS/DISTRIBUTION PANEL FEEDER CIRCUIT BREAKERS SHALL MATCH THE NOMENCLATURE PROVIDED BY THE OWNER AT THE END OF THE CONTRACT.
- ALL EXTERIOR MOUNTED EQUIPMENT SHALL BE WEATHERPROOF AND PROVIDED IN A WEATHERPROOF ENCLOSURE.
- INSTALL RACEWAY SYSTEMS AS FOLLOWS:
  - RIGID GALVANIZED STEEL IN ALL OUTDOOR LOCATIONS AND IN INDOOR LOCATIONS WHERE SUBJECT TO PHYSICAL DAMAGE.
  - I.M.C. OR E.M.T. IN ALL INDOOR AREAS.
  - FLEXIBLE METAL CONDUIT FOR FINAL CONNECTIONS TO LIGHT FIXTURES, MOTORS, VIBRATING ELECTRICAL EQUIPMENT AND HORIZONTAL RUNS IN WOOD STUD WALLS.
  - PVC CONDUIT FOR UNDER GROUND RUNS. USE 20 MIL PVC TAPED RIGID STEEL RISER ELBOWS AND RISERS FOR CONDUIT STUB-UPS.
  - USE COMPRESSION TYPE FITTINGS FOR ALL METALLIC CONDUIT.
  - 3/4" CONDUIT MINIMUM FOR UNDER GROUND INSTALLATIONS.
- ALL NEW WIRING SHALL BE COPPER.
- PROVIDE THE OWNER, ENGINEER AND CITY OF GRASS VALLEY BLDG. DEPT. WITH ONE SET OF 'AS-BUILTS' AT THE COMPLETION OF JOB.
- CONDUIT ROUTING INDICATED ON THESE PLANS IS DIAGRAMMATIC. ACTUAL ROUTING OF CONDUITS SHALL BE COORDINATED IN THE FIELD TO AVOID INTERFERENCE WITH OTHER UTILITIES AND TRADES. THE CONTRACTOR SHALL INSTALL ALL CONDUIT, JUNCTION/PULL BOXES, ETC., AS REQUIRED FOR A COMPLETE SYSTEM IN FULL COMPLIANCE WITH ALL APPLICABLE CODES.
- ALL OUTLET LOCATIONS SHALL BE COORDINATED WITH ARCHITECTURAL ELEVATIONS PRIOR TO INSTALLATION.
- EXACT LOCATION OF ALL CEILING MOUNTED DEVICES SHALL BE AS INDICATED ON THE ARCHITECTURAL REFLECTED CEILING PLANS.

- ELECTRICAL CONTRACTOR SHALL PERFORM ALL WORK IN STRICT ACCORDANCE WITH GOVERNING CODES.
- ALL EQUIPMENT SHALL BE NEW AND BEAR A "UL" LABEL - U.O.N.
- COMPLETE ELECTRICAL INSTALLATION SHALL BE GUARANTEED IN WRITING FOR A PERIOD OF (1) YEAR - U.O.N.
- ELECTRICAL CONTRACTOR SHALL VISIT SITE PRIOR TO BID DATE, TO VERIFY ALL EXISTING CONDITIONS TO BE ENCOUNTERED IN THE INSTALLATION OF ALL NEW EQUIPMENT, FIXTURES DEVICES, FEEDERS, ETC.. EXACT INSTALLATION METHOD AND REQUIREMENTS SHALL BE VERIFIED AND DETERMINED PRIOR TO BID DATE. CONTRACTORS SHALL IMMEDIATELY NOTIFY THIS ENGINEER OF ANY REQUIRED MODIFICATIONS WHICH ARE NOT SHOWN ON THESE DRAWINGS. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED.
- ALL EQUIPMENT ELECTRICAL CHARACTERISTICS, LOCATIONS, AND CONNECTION REQUIREMENTS SHALL BE VERIFIED PRIOR TO ANY ROUGH-IN WORK.
- ALL POWER AND LIGHTING BRANCH CIRCUITS SHALL BE INSTALLED WITH A #12 GREEN GROUND WIRE U.O.N. THE COMPLETE ELECTRICAL SYSTEM SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE 2019 CALIFORNIA ELECTRICAL CODE (CEC).
- IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO DO ALL CORING, CUTTING, PATCHING AND REFINISHING OF WALLS AND SURFACES WHEREVER IT IS NECESSARY FOR HIM TO PENETRATE FOR HIS WORK. ALL OPENINGS MADE SHALL BE SEALED TO MEET THE RATED INTEGRITY OF THE PARTICULAR WALL, FLOOR OR CEILING.
- THE CONTRACTOR SHALL STRATEGICALLY LOCATE JUNCTION BOXES AND PULL BOXES/BOXES, ETC., IN ACCESSIBLE CEILING SPACES. PROVIDE ACCESS PANELS WHERE JUNCTION/PULL BOXES ARE LOCATED IN INACCESSIBLE CEILING SPACES. COORDINATE LOCATION OF REQUIRED ACCESS PANELS PRIOR TO ROUGH-IN.
- ALL WIRING AND ELECTRICAL EQUIPMENT INSTALLED FOR MECHANICAL AND PLUMBING EQUIPMENT SHALL BE IN ACCORDANCE WITH THESE DRAWINGS AND THE WIRING DIAGRAMS OF THE MECHANICAL AND PLUMBING DRAWINGS.
- UNLESS SPECIFICALLY SHOWN ON THESE PLANS NO STRUCTURAL MEMBER SHALL BE CUT, DRILLED, OR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND PG&E.
- ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.
- CONTRACTOR SHALL INCLUDE ALL COMMISSIONING REQUIREMENTS INDICATED IN THE COMMISSIONING PLAN AND REPORT INCLUDING SUFFICIENT TIME ALLOCATED FOR THE NECESSARY PREPARATION OF REPORTS, TESTING TRAINING REQUIRED.

# REFERENCES & ABBREVIATIONS

⊖	DETAIL REFERENCE	MCB	MAIN CIRCUIT BREAKER
□	KEYNOTE REFERENCE	FLA	FULL LOAD AMPS
A.F.F.	ABOVE FINISH FLOOR	C.	CONDUIT
U.O.N.	UNLESS OTHERWISE NOTED	V.	VOLTS
C.O.	CONDUIT ONLY W/PULL ROPE	A	AMPS
WP	WEATHERPROOF	GFI	GROUND FAULT INTER R UPTER
CU.	COPPER	GND	GROUND
M.L.O.	MAIN LUGS ONLY	V.L.	VERIFY LOCATION
E or (E)	EXISTING TO REMAIN	A.C.	ABOVE COUNTER
EM.	EMERGENCY	N.L.	NIGHT LIGHT

# APPLICABLE CODES

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS, AND THE REQUIREMENTS OF THE CALIFORNIA CODE OF REGULATIONS (C.C.R.), TITLE 24, INCLUSIVE OF:

- 2019 CALIFORNIA ADMINISTRATIVE CODE (CAC), C.C.R. TITLE 24, PART 1
- 2019 CALIFORNIA BUILDING CODE (CBC), C.C.R. TITLE 24, PART 2, BASED ON 2018 INTERNATIONAL BUILDING CODE.
- 2019 CALIFORNIA ELECTRICAL CODE (CEC), C.C.R. TITLE 24, PART 3, BASED ON 2017 NATIONAL ELECTRICAL CODE (NEC).
- 2019 CALIFORNIA MECHANICAL CODE (CMC), C.C.R. TITLE 24, PART 4, BASED ON 2018 UNIFORM MECHANICAL CODE (UMC).
- 2019 CALIFORNIA PLUMBING CODE (CPC), C.C.R. TITLE 24, PART 5, BASED ON 2018 UNIFORM PLUMBING CODE (UPC).
- 2019 CALIFORNIA ENERGY CODE, C.C.R. TITLE 24, PART 6.
- 2019 CALIFORNIA FIRE CODE (CFC), C.C.R. TITLE 24, PART 9, BASED ON 2018 INTERNATIONAL FIRE CODE.
- 2019 CALIFORNIA EXISTING BUILDING CODE, C.C.R. TITLE 24, PART 10, BASED ON 2018 INTERNATIONAL EXISTING BUILDING CODE.
- 2019 CALIFORNIA REFERENCED STANDARDS CODE, C.C.R. TITLE 24, PART 12.

# SYMBOL LIST

— — — — —	CONDUIT RUN, CONCEALED IN CEILING, WALLS OR UNDER FLOOR, 3/4" MIN.	⊙	JUNCTION BOX.
— — — — —	CONDUIT RUN, UNDER GROUND.	⊖	FUSED DISCONNECT SWITCH, HEAVY DUTY TYPE WITH REQUIRED QUANTITY OF DUAL ELEMENT TIME DELAY FUSES. NEMA 3R FOR OUTDOOR USE. AS = SWITCH AMPERE RATING. P = NUMBER OF POLES. AF = FUSE AMPERE RATING.
— — — — —	CAT 5	⊗	ELECTRICAL DETAIL CALLOUT IDENTIFICATION SYMBOL.
— — — — —	CONDUIT STUBBED OUT AND CAPPED, PULL LINE IN PLACE.	⊗	NOTE IDENTIFICATION SYMBOL. NUMBER INDICATES NOTE.
— — — — —	FLEXIBLE CONDUIT, SEALTITE WHERE EXPOSED TO WEATHER. REFER TO SPECIFICATIONS FOR USE.	(E)	EXISTING EQUIPMENT TO REMAIN IN OPERATION.
—EA—	EXISTING CONDUIT TO BE ABANDONED IN PLACE.	(N)	NEW EQUIPMENT.
—EN—	EXISTING CONDUIT WITH NEW CONDUCTOR S.	CTB	COMMUNICATION TERMINAL BACKBOARD.
—EX—	EXISTING CONDUIT TO BE RE-USED. CONDUCTORS TO BE DISCONNECTED AND REMOVED.	AT	CIRCUIT BREAKER AMPERE TRIP RATING (SINGLE LINE DIAGRAM).
— — — — —	CONDUIT TURNED DOWN.	⊖	SURFACE MOUNTED LED CANOPY LIGHT FIXTURE, SHADING INDICATES FIXTURE TO BE PROVIDED WITH INTEGRAL 90 MINUTE 1,400 LUMEN BATTERY PACK.
— — — — —	CONDUIT TURNED UP.	⊖	LIGHTING FIXTURE IDENTIFICATION SYMBOL. LETTER INDICATES TYPE OF FIXTURE. NUMERAL AT TOP OF HEXAGON INDICATES NUMBER OF FIXTURES REQUIRED. NUMBER AT BOTTOM OF HEXAGON INDICATES MOUNTING HEIGHT FROM FINISHED GRADE TO BOTTOM OF FIXTURE. OMISSION OF MOUNTING HEIGHT INDICATES CEILING MOUNTING.
#10	CROSS BARS ON CONDUIT RUNS INDICATE NUMBER OF #12 WIRES CONTAINED THEREIN. TWO #12 ARE TO BE PROVIDED WHEN CROSS LINES ARE NOT SHOWN. NUMERALS ADJACENT TO CROSS LINES ON CONDUIT RUNS INDICATE SIZE OF CONDUCTORS IN LIEU OF #12. PROVIDE CONDUIT SIZE AS REQUIRED TO ACCOMMODATE THE WIRE SIZE TO BE CONTAINED THEREIN.	⊖	MOLDED CASE CIRCUIT BREAKER (SINGLE LINE DIAGRAM).
B-1,3	CONDUIT HOME RUN TO PANEL BOARD. LETTER AND NUMERALS INDICATES ELECTRICAL PANEL AND CIRCUIT NUMBER.	⊖	GROUND.
— — — — —	BRANCH CIRCUIT PANEL, MOUNTING AS SHOWN ON SCHEDULES.	⊖	EMERGENCY FUEL SHUT-OFF

EXISTING 120/208V, 3 Ph, 4W.												
100 AMP BUS				22,000 ISC				SURFACE MOUNTED NEMA 1				
DESCRIPTION	KVA	BKR	CKT	Ph A	Ph B	Ph C	CKT	BKR	KVA	DESCRIPTION		
(E) LIGHTING	1.0	20/1	1	1.6			2		0.6			
(E) OUTLETS	0.9	20/1	3		1.5		4	20/3	0.6	(E) EXHAUST FAN		
(E) OUTLETS	0.5	20/1	5			1.1	6		0.6			
<b>DIESEL DAY TANK</b>	0.5	20/1	7	1.1			8		0.6			
<b>DIESEL DAY TANK</b>	0.5	20/1	9		1.1		10	20/3	0.6	(E) EXHAUST FAN		
(E) EMERGENCY LTG	0.2	20/1	11			0.8	12		0.6			
(E) ENGINE WATER HTR	0.8	20/1	13	0.9			14	20/1	0.1	<b>OVERFILL ALARM</b>		
(E) ENGINE WATER HTR	0.8	20/1	15		1.3		16	20/1	0.5	(E) BATTERY CHARGER		
(E) GEN POWER	1.0	20/2	17			1.1	18	20/1	0.1	<b>VEEDER ROOT</b>		
			19	1.0			20	30/2		(E) OUTLET		
SPACE			21				22					
SPACE			23				24			SPACE		
SPACE			25				26			SPACE		
SPACE			27				28			SPACE		
SPACE			29				30			SPACE		
SUBTOTAL:				4.6	3.9	3.0						
CONNECTED LOAD				11.5 KVA								MAIN LUGS ONLY
25% LIGHTING LOAD				0.3 KVA								
25% LARGEST MOTOR				KVA								
TOTAL LOAD				11.8 KVA / 0.360 FACTOR =	33 AMPS							

● EXISTING BREAKER. CONNECT NEW LOAD (E) PANEL FEEDER: 1-1/2" C - 4 #1 CU, 1 #8 GND

NO.	DATE	REVISIONS	DESCRIPTION
1	1-19-24	REVISED PER CLIENT COMMENTS	
2	1-25-24	REVISED PER CLIENT COMMENTS	
3	3-11-24	REVISED PER CLIENT COMMENTS	

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 949.749.0222 1.714.978.2615  
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SHEET TITLE  
**ELECTRICAL SCHEDULES & DETAILS**

PROJECT ADDRESS  
**EL SOBRANTE WATER TREATMENT PLANT  
 5500 AMEND RD  
 EL SOBRANTE, CA 94803**

EBMUD  
 PLANT ENGINEERING SERVICES/CONSTRUCTION  
 315 11TH ST  
 OAKLAND, CA 94607

CHECKED **R. HENRIKSEN**

DRAWN BY **C. GILLAND**

JOB NUMBER  
**TS094301**

SHEET **3** OF **11**

DATE **8-2-22**

SCALE **NOTED**

BID SET **3/15/24**

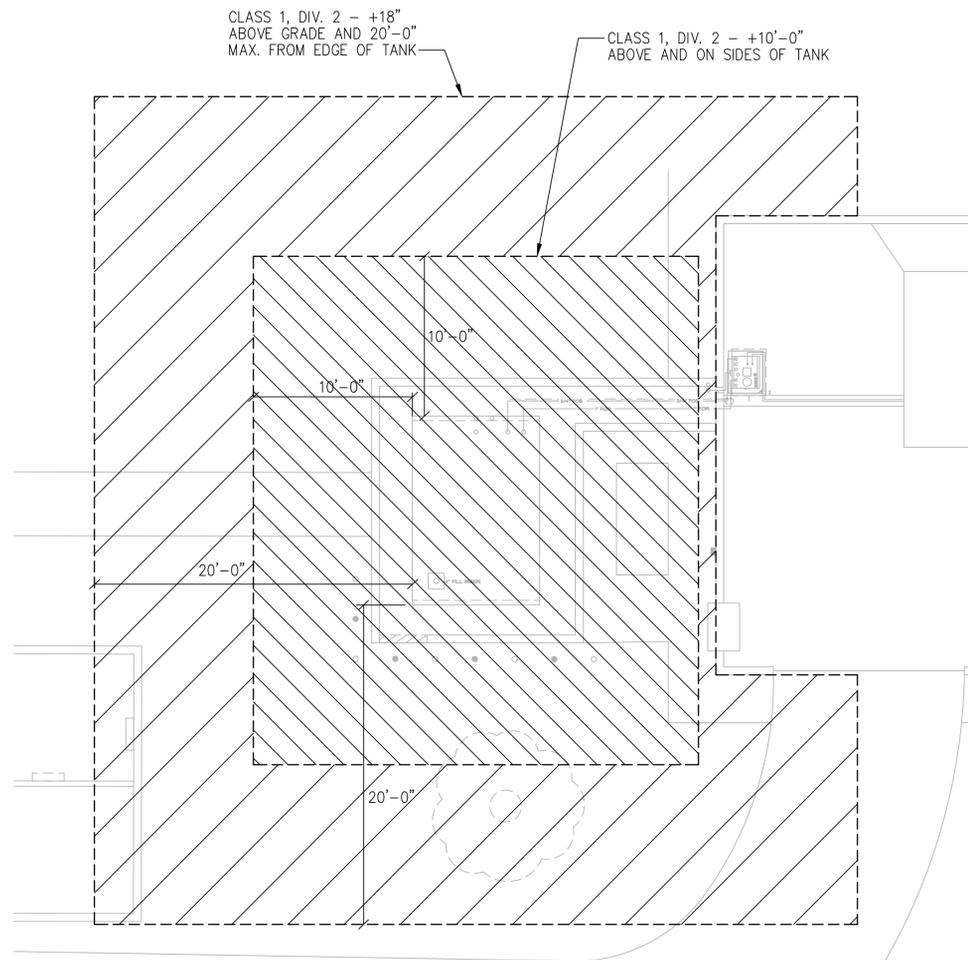
**SACRAMENTO ENGINEERING CONSULTANTS**

10555 Old Placerville Road  
 Sacramento, CA 95827-2503  
 Phone: (916) 368-4468  
 Fax: (916) 368-4490  
 www.seeng.com

Job No. **22697**

Date Signed: March 5, 2024





**AREA CLASSIFICATION - TANK**

SCALE: 1/4"=1'-0"

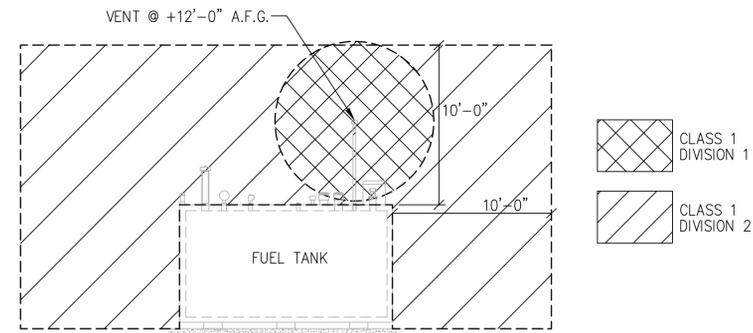
A  
E-2

**CONDUIT NOTES:**

- ALL CONDUIT IN EXPLOSION PROOF AREAS SHALL BE RIGID GALVANIZED STEEL.
- CONDUITS PASSING THROUGH EXPLOSION PROOF AREAS DO NOT REQUIRE SEALS.
- CONDUITS ENTERING THE EXPLOSION PROOF AREAS SHALL BE PROVIDED WITH A SEAL LOCATED WITHIN THE 10'-0" OF THE AREA BOUNDARY.
- CONDUITS TERMINATING AT ENCLOSURES CONTAINING MOTORS, SWITCHES AND CIRCUIT BREAKERS, THAT ARE LOCATED IN DIVISION 1 AND/OR DIVISION 2 AREAS SHALL BE PROVIDED WITH A SEAL LOCATED WITHIN 18" OF THE ENCLOSURE.
- CONDUIT FITTINGS WITHIN THE EXPLOSION PROOF AREAS SHALL BE U.L. LISTED FOR USE IN SUBJECT AREAS.

**PLAN NOTES:**

- ALL CONDUIT / FITTINGS AND WIRING METHODS WITHIN CLASSIFIED AREA SHALL BE IN COMPLIANCE WITH CLASS 1, DIVISION 1 AND CLASS 1, DIVISION 2 INSTALLATION METHODS. PROVIDE CONDUIT SEALS PER C.E.C. ARTICLE 501.15, 505.16 AND 514.9.
- WIRING IN HAZARDOUS AREAS SHALL COMPLY WITH APPLICABLE SECTIONS OF CALIFORNIA ELECTRICAL CODE (C.E.C.) ARTICLES 500 THROUGH 514.
- GROUNDING AND BONDING IN CLASS 1 LOCATIONS SHALL COMPLY WITH C.E.C. ARTICLE 501.30 (514.16).
- REFER TO SHEET E4, AST ELECTRICAL PLANS, FOR EQUIPMENT LOCATIONS, CONDUIT & CIRCUITING REQUIREMENTS.
- THE INSTALLATION OF INTRINSICALLY SAFE (I.S.) APPARATUS, WIRING AND SYSTEMS FOR CLASS 1 LOCATIONS SHALL COMPLY WITH C.E.C. ARTICLE 504.



**ELEVATION AT ABOVE GROUND TANK**

SCALE: 1/4"=1'-0"

B  
E-2



Date Signed: March 5, 2024

NO.	DATE	DESCRIPTION
1	1-19-24	REVISED PER CLIENT COMMENTS
2	1-25-24	REVISED PER CLIENT COMMENTS
3	3-11-24	REVISED PER CLIENT COMMENTS

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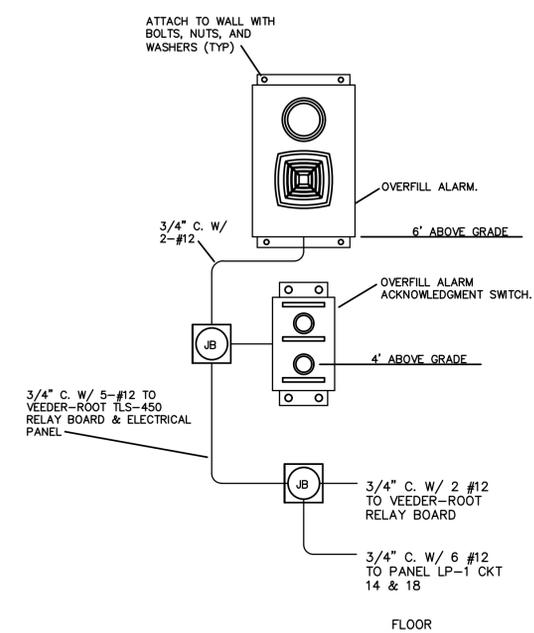
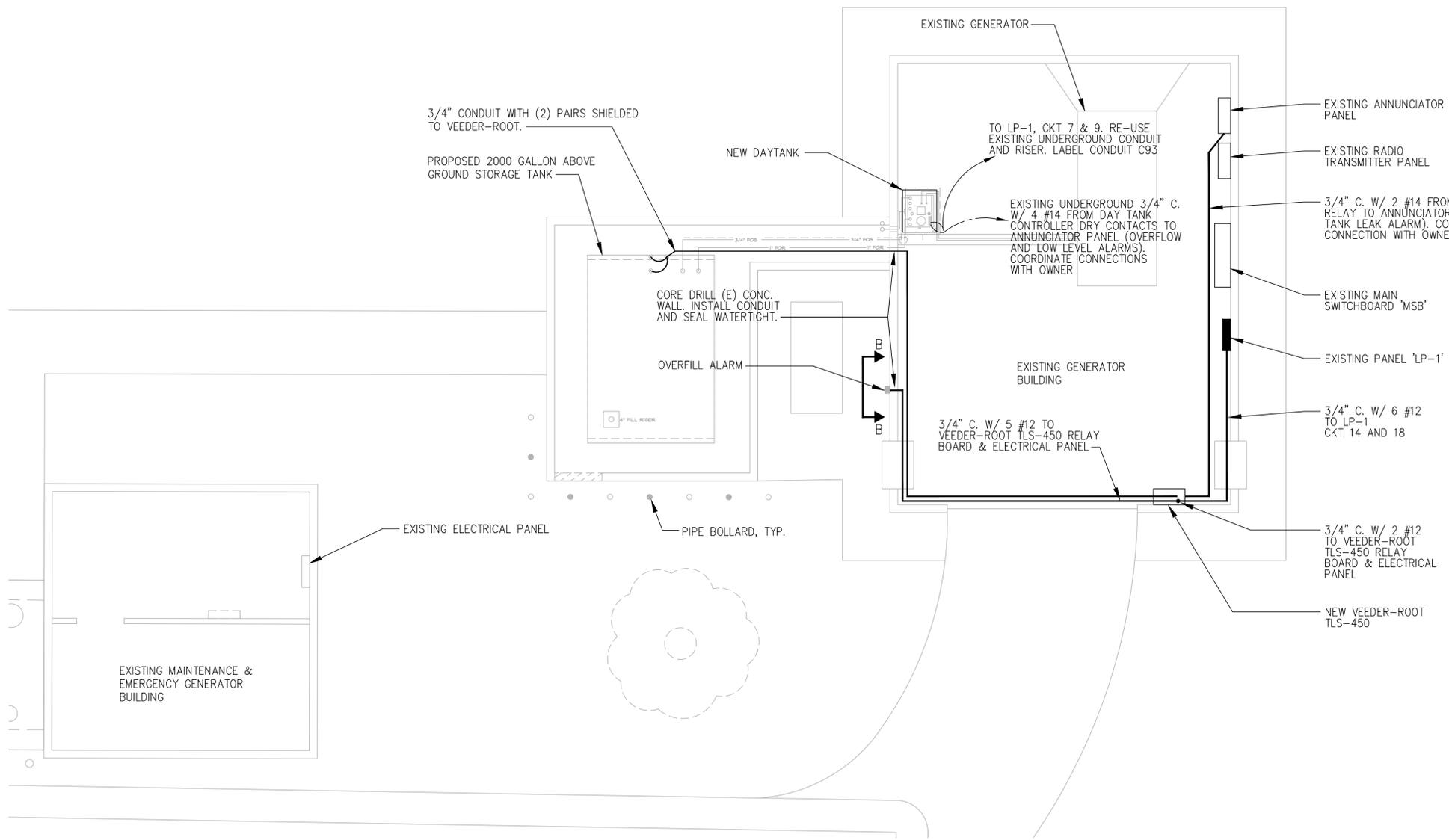
**SHEET TITLE**  
AREA CLASSIFICATION PLAN

**PROJECT ADDRESS**  
EL SOBRANTE WATER TREATMENT PLANT  
5500 AMEND RD  
EL SOBRANTE, CA 94803

**CLIENT**  
ERMUD  
PLANT ENGINEERING SERVICES/CONSTRUCTION  
315 11TH ST  
OAKLAND, CA 94601

**CHECKED** R. HENRIKSON  
**DRAWN BY** C. GILLAND  
**JOB NUMBER** T5894301  
**DATE** 8-2-22  
**SHEET** 9 OF 11  
**SCALE** NOTED

BID SET 3/15/24



**OVER-FILL ALARM ELEVATION B-B** B  
**SCALE: NONE** E-3

**ELECTRICAL NOTES**

1. CONDUIT ROUTING INDICATED ON THE PLANS IS DIAGRAMMATIC. ACTUAL ROUTING OF UNDER GROUND CONDUITS SHALL BE COORDINATED IN THE FIELD TO AVOID INTERFERENCE WITH OTHER UTILITIES AND TRADES.
2. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO MAINTAIN REQUIRED CLEARANCES BETWEEN UNDER GROUND ELECTRICAL CONDUITS AND FOOTINGS. CONDUIT STUB-UPS SHALL NOT BE INSTALLED IN FOOTINGS, EXACT METHOD FOR STUBBING-UP CONDUITS AT FOOTING LOCATIONS SHALL BE COORDINATED IN THE FIELD WITH THE GENERAL CONTRACTOR AND THE ARCHITECT.
3. ALL CONDUIT / FITTINGS AND WIRING METHODS WITHIN THE WORK AREA SHALL BE IN COMPLIANCE WITH 2022 CEC ARTICLE 514.
4. MAKE REQUIRED CONNECTIONS FROM THE TANK SENSORS TO THE VEEDER-ROOT FUEL MONITORING SYSTEM. ALL WORK SHALL BE IN COMPLIANCE WITH THE VEEDER-ROOT MANUFACTURER'S REPRESENTATIVE REQUIREMENTS. SEE SHEET F-4.
5. COORDINATE CONNECTIONS TO THE FUEL TANK (i.e. GROUNDING, SENSORS, PROBES) WITH THE FUEL TANK SUPPLIER, AND MAKE ALL CONNECTIONS AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. SEE SHEET F-4.
6. INTRINSICALLY SAFE WIRING, BETWEEN THE TANK SENSORS/PROBES AND THE VEEDER -ROOT SYSTEM, SHALL COMPLY WITH 2022 C.E.C. ARTICLE 504.
7. REFER TO DRAWING E-1, GENERAL NOTES, FOR ADDITIONAL REQUIREMENTS.
8. NEW CONDUITS TO BE ROUTED ON WALLS AND OVER TOP OF EXISTING PANELS. SUPPORT WITH CONDUIT CLIPS AT 10' O.C. MAX.

**POWER & SIGNAL PLAN**  
**SCALE: 1/4"=1'-0"**

A  
E-3

**SACRAMENTO ENGINEERING CONSULTANTS**  
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 Sacramento, CA 95827-2503  
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 Fax: (916) 368-4490  
 www.saceng.com  
 Job No. 22697

Date Signed: March 5, 2024

NO.	DATE	DESCRIPTION
1	1-19-24	REVISED PER CLIENT COMMENTS
2	1-25-24	REVISED PER CLIENT COMMENTS
3	3-11-24	REVISED PER CLIENT COMMENTS

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<p>SHEET TITLE: <b>AST ELECTRICAL PLANS</b></p>	<p>PROJECT ADDRESS:  <b>EL SOBRANTE WATER TREATMENT PLANT</b>  <b>5500 AMEND RD</b>  <b>EL SOBRANTE, CA 94803</b></p>
---	---

<p>DATE: <b>8-2-22</b></p>	<p>SCALE: <b>NOTED</b></p>
----------------------------	----------------------------

<p>CHECKED: <b>R. HENRIKSEN</b></p>	<p>DRAWN BY: <b>C. GILLAND</b></p>
<p>JOB NUMBER: <b>T5894301</b></p>	<p>SHEET: <b>10 OF 11</b></p>

BID SET 3/15/24

STATE OF CALIFORNIA  
**Electrical Power Distribution**  
 NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION NRCC-ELC-E

CERTIFICATE OF COMPLIANCE  
 This document is used to demonstrate compliance with mandatory requirements in §130.5 for electrical systems in newly constructed nonresidential, high-rise residential and hotel/motel occupancies. Additions and alterations to electrical service systems in these occupancies will also use this document to demonstrate compliance per §141.0(a) or §141.0(b)(2) for alterations.

Project Name: El Sobrante Water Treatment Plant Report Page: Page 1 of 4  
 Project Address: 55000 Amend Rd Date Prepared: 11-25-22

**A. GENERAL INFORMATION**

01 Project Location (city) El Sobrante 02 Occupancy Types Within Project:  
 Office  Retail  Warehouse  Hotel/ Motel  School  Support Areas  
 Parking Garage  High-Rise Residential  Relocatable  Healthcare Facilities  Other (Write In): Water Treatment

**B. PROJECT SCOPE**

Table Instructions: Include any electrical service systems that are within the scope of the permit application.

01	02	03	04	05	06
Electrical Service Designation/Description	Scope of Work <sup>1</sup>	Rating (kVA)	Utility Provided Metering System Exception to §130.5(a) <sup>2</sup>	System subject to CA Elec Code Article 517 Exception to §130.5(a)(b)	Demand Response Controls Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections §120.2, §130.1 and §130.2 and compliance documents NRCC-MCH, NRCC-LTI and NRCC-LTS will indicate when demand response controls are required.
existing electrical service	Add/Alt to feeders and branch circuits only		<input checked="" type="checkbox"/>	<input type="checkbox"/>	

<sup>1</sup> FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c), no other requirements from 130.5 are required.  
<sup>2</sup> Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

**C. COMPLIANCE RESULTS**

Table Instructions: If this table says "DOES NOT COMPLY" refer to Table D for guidance and review the Table that indicates "No".

01	02	03	04	05
Service Electrical Metering §130.5(a)	AND	Separation for Monitoring §130.5(b)	AND	Voltage Drop §130.5(c)
(See Table F)		(See Table G)		(See Table H)
	AND		AND	Controlled Receptacles §130.5(d)
		Yes		(See Table I)
				COMPLIES with Exceptional Conditions

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> January 2020

STATE OF CALIFORNIA  
**Electrical Power Distribution**  
 NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION NRCC-ELC-E

CERTIFICATE OF COMPLIANCE  
 Project Name: El Sobrante Water Treatment Plant Report Page: Page 2 of 4  
 Project Address: 55000 Amend Rd Date Prepared: 11-25-22

**D. EXCEPTIONAL CONDITIONS**

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

Table B indicates the project is exempt from §130.5(a) Service Electrical Metering requirements because the utility company has provided the project a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

**E. ADDITIONAL REMARKS**

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

**F. SERVICE ELECTRICAL METERING**

This Section Does Not Apply

**G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING**

This Section Does Not Apply

**H. VOLTAGE DROP**

Table Instructions: Please complete this table for entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with §130.5(c). For alterations, only the altered circuits must demonstrate compliance per §141.0(b)(2)(ii).

01	02	03	04	05
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method	Location of Voltage Drop Calculations <sup>1</sup>	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector
existing electrical service	<input checked="" type="checkbox"/> Voltage drop < 5% <input type="checkbox"/> Permitted by CA Elec Code (Exception to §130.5(c)) <sup>1</sup>	In construction documents	E-4	Pass <input type="checkbox"/> Fail <input type="checkbox"/>

<sup>1</sup> NOTES: If "Permitted by CA Elec Code" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.  
<sup>2</sup> FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

**I. CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES**

This Section Does Not Apply

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> January 2020

STATE OF CALIFORNIA  
**Electrical Power Distribution**  
 NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION NRCC-ELC-E

CERTIFICATE OF COMPLIANCE  
 Project Name: El Sobrante Water Treatment Plant Report Page: Page 3 of 4  
 Project Address: 55000 Amend Rd Date Prepared: 11-25-22

**J. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION**

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at [https://www2.energy.ca.gov/title24/2019standards/2019\\_compliance\\_documents/Nonresidential\\_Documents/NRCC/](https://www2.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCC/)

YES	NO	Form/Title	Field Inspector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-ELC-01-E - Must be submitted for all buildings.	Pass <input type="checkbox"/> Fail <input type="checkbox"/>

**K. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE**

There are no Certificates of Acceptance applicable to electrical power distribution requirements.

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> January 2020

STATE OF CALIFORNIA  
**Electrical Power Distribution**  
 NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION NRCC-ELC-E

CERTIFICATE OF COMPLIANCE  
 Project Name: El Sobrante Water Treatment Plant Report Page: Page 4 of 4  
 Project Address: 55000 Amend Rd Date Prepared: 11-25-22

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Rickert Henriksen Documentation Author Signature:

Company: Sacramento Engineering Consultants Signature Date: 11-25-2022

Address: 10555 Old Placerville Road CEA/HERS Certification Identification (if applicable):

City/State/Zip: Sacramento, CA 95827 Phone: (916) 368-4468

**RESPONSIBLE PERSON'S DECLARATION STATEMENT**

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Compliance is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
- The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
- The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
- I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the building provides to the building owner at occupancy.

Responsible Designer Name: Rickert Henriksen Responsible Designer Signature:

Company: Sacramento Engineering Consultants Date Signed: 11-25-2022

Address: 10555 Old Placerville Road License: E10629

City/State/Zip: Sacramento, CA 95827 Phone: (916) 368-4468

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards> January 2020

Table 8-4 Summary of Voltage Drop Limits

Circuit Volts (V)	2% Voltage Drop (V)	3% Voltage Drop (V)	Total Loss (V)
120	2.4	3.6	6.0
208	4.2	6.2	10.4
240	4.8	7.2	12.0
277	5.5	8.3	13.9
480	9.6	14.4	24.0

Table 8-4 Voltage Drop for Common Copper Wire Gauges and Current Loads

Wire	Circuit Amps	Maximum Feeder Length					Maximum Branch Circuit Length				
		120	208	240	277	480	120	208	240	277	480
14*	12	39	67	78	90	156	58	101	117	135	233
12*	16	46	80	93	107	185	69	120	139	160	278
10	24	48	83	96	111	192	72	125	144	166	288
8	32	57	99	115	132	229	86	149	172	199	344
6	40	73	127	146	169	293	110	190	220	253	439
4	52	89	154	178	206	356	134	232	267	309	535
2	72	103	178	206	237	412	154	267	309	356	617
0	96	123	212	245	283	490	184	319	368	424	735
00	108	137	238	274	317	549	206	357	412	475	823
0000	144	163	283	327	377	654	245	425	490	566	980
250 (kcmil)	164	170	294	340	392	679	255	441	509	588	1019
300	184	181	314	362	418	725	272	471	543	627	1087
350	200	195	338	390	450	779	292	506	584	675	1169
500	248	224	388	448	517	896	336	582	672	776	1344

Table 8-5 Voltage Drop for Common Aluminum Wire Gauges and Current Loads

Wire	Circuit Amps	Maximum Feeder Length					Maximum Branch Circuit Length				
		120	208	240	277	480	120	208	240	277	480
14*	12	24	41	47	55	95	36	62	71	82	142
12*	16	28	49	56	65	113	42	73	85	98	169
10	24	29	51	59	68	118	44	76	88	102	176
8	32	35	61	70	81	140	53	91	105	121	210
6	40	45	77	89	103	178	67	116	134	154	267
4	52	54	94	109	126	218	82	142	163	188	327
2	72	62	108	125	144	250	94	162	187	216	375
0	96	74	129	149	172	298	112	193	223	258	446
00	108	84	145	167	193	334	125	217	251	289	501
0000	144	99	172	198	229	397	149	258	298	344	595
250 (kcmil)	164	103	179	207	239	413	155	269	310	358	620
300	184	111	192	221	255	442	166	287	332	383	663
350	200	119	206	238	274	475	178	309	356	411	713
500	248	137	237	273	316	547	205	355	410	473	820

2019 Nonresidential Compliance Manual January 2019

REVISIONS

NO.	DATE	DESCRIPTION
1	1-19-24	REVISED PER CLIENTS COMMENTS
2	1-25-24	REVISED PER CLIENTS COMMENTS
3	3-11-24	REVISED PER CLIENTS COMMENTS

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 ENERGY COMPLIANCE - TITLE 24

PROJECT ADDRESS  
 EL SOBRANTE WATER TREATMENT PLANT  
 5500 AMEND RD  
 EL SOBRANTE, CA 94603

EBMUD  
 PLANT ENGINEERING SERVICES/CONSTRUCTION  
 315 11TH ST  
 OAKLAND, CA 94607

CHECKED R HENRIKSEN  
 DRAWN BY C. GILLAND  
 JOB NUMBER T5894301  
 SHEET 11 OF 11  
 E-4  
 SCALE NOTED  
 DATE 8-2-22  
 BID SET 3/15/24

PROFESSIONAL ENGINEER  
 Rickert Henriksen  
 No. E-10629  
 Exp. 6-30-2025  
 STATE OF CALIFORNIA

SACRAMENTO ENGINEERING CONSULTANTS  
 10555 Old Placerville Road  
 Sacramento, CA 95827-2503  
 Phone: (916) 368-4468  
 Fax: (916) 368-4490  
 www.seoeng.com  
 Job No. 22697

Date Signed: March 5, 2024

## **EXHIBIT F – SPECIFICATIONS**

SOBRANTE WATER TREATMENT PLANT STANDBY GENERATOR DIESEL  
TANK INSTALLATION

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APPENDIX A – Forms and Schedules

SECTION 01 11 00  
SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. The following is a general summary of work and is not all inclusive; the Contractor shall perform all other related or required work as fully described in the specifications and drawings.
- B. Work includes the following:
  - 1. Construction / Installation of:
    - a. One, 2,000 gallon aboveground diesel fuel storage tank.
    - b. One 50 gallon Day-Tank.
    - c. All associated piping, wiring and spill protection.
    - d. Tank and piping monitor system.
  - 2. Demolition / removal of:
    - a. One 2,000 gallon diesel aboveground fuel storage tank (Convault).
    - b. Close one 1,000 gallon diesel underground fuel storage tank in place.
    - c. Existing tank monitor systems, wiring and conduit.
    - d. One 50 gallon Day-Tank with associated electrical and piping.

1.2 RELATED SECTIONS

- A. Section 01 35 24 – Project Safety Requirements
- B. Section 01 75 17 – Field Testing and Startup
- C. Section 01 79 00 – Demonstration and Training

1.3 SEQUENCE OF MAIN ACTIVITIES

- A. The following sequence of main activities is presented for information purposes only and may be used as a guide for scheduling construction activities.



Description of Activity	Notes
Notice to Proceed	---
Notice to Commence Field Work	Pending receipt of acceptable required submittals
Construction	---
Field Testing and Training	---
<ul style="list-style-type: none"> <li>• Functional Testing</li> </ul>	See Section 01 75 17
<ul style="list-style-type: none"> <li>• Training</li> </ul>	See Section 01 79 00
Startup Test	See Section 01 75 17
Ready for Service	See Article 1.4.D
Contract Completion	See Article 1.4.D

#### 1.4 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK

##### A. Notice to Proceed.

1. Project Award is anticipated to be about one month after Bid Opening. See General Conditions Article 8.1 for more information for Notice to Proceed requirements.

##### B. Required Contract Completion

1. All work covered by the contract shall be completed within 90 calendar days after the Notice to Proceed.

#### 1.5 CONTRACT DRAWINGS

- ##### A. The drawings which form a part of this specification included in the RFP package. The District will accept no responsibility for errors resulting from misinterpretation or scaling of the drawings. The project drawings and some standard and reference drawings have been reduced in scale approximately one half.

1. Prior to bid opening, full-size drawings are available as provided in the RFP Package.

## 1.6 CHANGES

- A. Changes to the work will be set forth in written Contract Change Orders that specify the work to be done or change to be made, and the payment to be made or credit to be taken and the adjustment of time, if any. See General Conditions, Article 7.
- B. A copy of the District's standard Contract Change Order form is in Appendix A

## 1.7 COMMUNICATIONS REGARDING THE WORK

- A. After award of contract, all communications regarding the work covered by this Specification shall be addressed to Christian Narvaez, Associate Mechanical Engineer, and e-mailed to:

Christian.Narvaez@ebmud.com

## 1.8 WAGE RELATED WORKPLACE POSTINGS

- A. The Contractor and every Subcontractor shall post at the workplace and comply with all required wage related workplace postings. Copies of the required postings may be downloaded or ordered electronically from the Department of Industrial Relations website at <http://www.dir.ca.gov/wpnodb.html>.

## 1.9 DISTRICT EQUAL EMPLOYMENT OPPORTUNITY (EEO) POSTERS

- A. Post in a prominent and accessible location on the project site District-furnished EEO posters. The posters shall be maintained for the duration of the project. Request additional posters from the Engineer if their replacement becomes necessary.

## 1.10 LOCAL EMPLOYMENT AND TRAINING PROGRAM.

- A. The District encourages Contractors (and their subcontractors), who have active District contracts, to provide job training and employ local residents with little work experience and/or residents who are returning to work from welfare.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

## SECTION 01 14 00

### WORK RESTRICTIONS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This section describes special requirements and construction constraints that may affect the Work. These requirements and constraints are in addition to those appearing elsewhere in the specifications.
- B. Related sections:
  - 1. Section 01 32 00 – Construction Progress Documentation
  - 2. Section 01 35 24 – Project Safety Requirements
  - 3. Section 01 35 44 – Environmental Requirements
  - 4. Section 01 35 53 – Security Procedures
  - 5. Section 01 50 00 – Temporary Facilities and Controls
  - 6. Section 02 41 13 – Selective Site Demolition

##### 1.2 SUBMITTALS

- A. Certification that all requirements of agencies having jurisdiction over the Work have been satisfied
- B. Submit detailed facility outage plans for approval.

##### 1.3 WORK HOURS

- A. Work or activity of any kind shall be limited to the hours from 7:00 a.m. to 6:00 p.m. Monday through Friday with the exception of required outages, as described in Section 01 35 13 – Special Project Procedures. .
- B. Work in excess of eight hours per day, work on Saturdays, work on Sundays, or work on District holidays requires prior consent of the Engineer and is subject to Cost of Overtime Construction Inspection. Notify the Engineer no less than 96 hours prior to beginning scheduled work at night or on a Saturday, Sunday or District holidays.
- C. District holidays
  - 1. Holidays are:

New Year's Day  
 Martin Luther King Day (3rd Monday in January)  
 Lincoln's Birthday  
 Washington's Birthday (3rd Monday in February)  
 Cesar Chavez's Birthday  
 Memorial Day (last Monday in May)  
 Juneteenth (June 19)  
 Independence Day  
 Labor Day (1st Monday in September)  
 Columbus Day (2nd Monday in October)  
 Veteran's Day  
 Thanksgiving Day and following Friday  
 Christmas Day  
 Day after Christmas

2. When a holiday falls on Sunday, the following Monday shall be observed as the holiday. When a holiday falls on Saturday, the preceding Friday shall be observed as the holiday.
  - a. Day after Christmas Exception:
    - 1) When the Day after Christmas falls on a Saturday, the Day after Christmas holiday shall be observed on the following Monday.
    - 2) When the Day after Christmas falls on a Monday, the Day after Christmas holiday shall be observed on the following Tuesday.

1.4 COST OF OVERTIME CONSTRUCTION INSPECTION

- A. Overtime construction work performed at the option of, or for the convenience of, the Contractor will be inspected by the District at expense of the Contractor. For any such overtime beyond the regular 8-hour day and for any time worked on Saturday, Sunday, or holidays the charges will be as shown in the following schedule:

	<u>Charge per Hour</u>
Associate Engineer	\$125.63
Assistant Engineer	\$113.77
Senior Construction Inspector	\$110.98
Construction Inspector	\$100.57
Junior Engineer	\$98.13
Pickup truck	\$42.39

- B. Charges for overtime inspection shall be captured on a Daily Extra Work Report (Appendix A). The daily extra work report shall include an accurate description of the overtime work being performed and the total District staff/equipment hours, which shall be signed by the Contractor. At the end of the month the charges will be totaled, and a credit change order will be prepared for execution, and for deduction of the overtime inspection charges in the following month's payment.

- C. There will be no charges for the inspection of overtime work ordered by the Engineer or required by the specifications.

#### 1.5 COOPERATION WITH OTHER WORK FORCES

- A. Other contractors, other utilities and public agencies or their contractors, other District contractors, and District personnel may be working in the vicinity during the project construction period.
- B. Any costs for providing cooperation with other work forces shall be considered as included in the bid price for the various contract items of Work and no separate payment will be made therefor.

#### 1.6 MAINTENANCE OF FACILITY OPERATION

- A. The Contractor will be performing Work at or near operating telecommunications, water storage, water treatment, and water distribution sites. Under these conditions, extra precautions will be necessary to ensure that no damage occurs to those treatment or distribution facilities, including piping, utilities, roads, and structures, that are to remain in operation and are not to be modified or replaced. Any temporary facilities, materials, equipment and labor required to achieve these objectives shall be provided by the Contractor at its own expense. At the completion of Work, all such temporary facilities, materials and equipment remaining shall be removed from the site. See Section 01 35 13 Special Project Procedures.

#### 1.7 CONSTRUCTION NOISE

- A. Noise-generating activities greater than 90 dBA (impact construction such as concrete breaking, concrete crushing, tree grinding, etc.) shall be limited to the hours of 7:30 a.m. and 5:30 p.m., Monday through Friday.

#### 1.8 SCHEDULING CONSTRAINTS

- A. Exceptions to the work hour constraints in Article 1.3 – Work Hours may be made upon application to the Engineer, if required, for work outages discussed in Article 1.12 – Shutdowns.
- B. All Work shall be in accordance with local ordinances including encroachment permit conditions included in Appendix B.

#### 1.9 OUTSIDE AGENCY PERMITS

- A. The District initiated the application process for:
  - 1. Contra Costa County Environmental Health existing AST Removal /Closure In Place.
  - 2. Contra Costa County Fire Protection District new AST Construction / AST Removal.

3. County of Contra Costa Building Department – Building and Electrical Permit
  - B. Contractor to provide licenses, certifications, work plans and site safety plans to District to complete permit applications.
  - C. .
- 1.10 NOT USED
- 1.11 AVAILABLE UTILITIES
- A. Water for rinsing or flushing will be provided by the District as per Section 01 50 00 – Temporary Facilities and Controls. The water shall be drawn from hose bib near work location. The Contractor shall provide all other water.
    1. Availability of water is subject to District operational requirements.
  - B. 120 volt power will be available from outdoor receptacle near work location. The Contractor shall provide all other power.
- 1.12 WORK DURING PG&E PUBLIC SAFETY POWER SHUTOFF (PSPS) EVENTS
- A. PG&E may implement a public safety power shutoff (PSPS) due to excessively dry or windy conditions which will turn off temporary or permanent PG&E power.
  - B. Request(s) for extension of Contract Time resulting from PSPS events will be considered Weather Conditions Unfavorable for Prosecution of Work per General Conditions Article 8.5.
  - C. Information on PSPS events can be found on the PG&E website here:  
<https://pgealerts.alerts.pge.com/updates/>
- 1.13 WORK DURING NATIONAL WEATHER SERVICE RED FLAG WARNINGS & FIRE WEATHER WATCHES
- A. During any red flag warnings or fire watch events in the work area, stop all Hot Work including any electric or gas welding, cutting or brazing, wire or grinding wheel, or any extreme heat, flame or spark producing equipment, procedures or operations, unless wildfire safety mitigations have been approved by the Engineer.
  - B. Request(s) for extension of Contract Time resulting from red flag or fire watch events will be considered Weather Conditions Unfavorable for Prosecution of Work per General Conditions Article 8.5.
  - C. Obtain approval from the Engineer for any type of Hot Work during any National Weather Service Red Flag Warnings & Fire Weather Watches.
  - D. Exercise extreme precaution for all approved work during any National Weather Service Red Flag Warnings & Fire Weather Watches.

E. Red flag and Fire Watch warnings can be found here:

<https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/>

1.14 NOT USED

1.15 NOT USED

1.16 NOT USED

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

## SECTION 01 31 19

### PROJECT MEETINGS

#### PART 1 - GENERAL

##### 1.1 PRECONSTRUCTION CONFERENCE

- A. Upon receipt of the Notice to Proceed, or at an earlier time if mutually agreeable, the Engineer will arrange a preconstruction conference to be attended by the Contractor's project representative authorized to commit on behalf of the Contractor and to direct the performance of the Work by others as well as the Contractor's superintendent, the Engineer, District representatives, major subcontractors, and others involved in the execution of the Work.
- B. The purpose of this conference will be to establish a working relationship and understanding between the parties and to discuss project organization, job communications, the Construction Schedule, shop drawing submittals and processing, cost breakdown payment applications and their processing, extra work procedures, safety requirements, permits and inspections, and such other subjects as may be pertinent for the execution of the Work.

##### 1.2 WEEKLY PROGRESS MEETINGS

- A. The Engineer will arrange and conduct weekly progress meetings. The Engineer will prepare and circulate an agenda for each meeting.
- B. Progress meetings will be conducted at a time that is mutually agreed upon by the Engineer and the Contractor. Progress meetings shall be attended by the Engineer, District Operations personnel, Contractor's project representative and superintendent, and representatives of all subcontractors required by the Contractor or requested by the Engineer.
- C. Progress meetings will be held at any of the following locations, as determined by the Engineer:
  - 1.
  - 2. Project job site at 5500 Amend Rd, El Sobrante, CA 94803
  - 3. Other locations as determined by the Engineer
- D. The purpose of the meetings will be to facilitate the work of the Contractor and any subcontractor or other organization that is not up to schedule, resolve conflicts, identify and resolve any potential delays and, in general, coordinate and facilitate the execution of the Work.



- E. The agenda of progress meetings shall include review of work progress and the latest Construction Progress Schedule, potential project delays, submittal reviews, review neighborhood/community concerns, information requests, safety concerns including but not limited to lock out/tag out plans, environmental concerns including but not limited to storm water management, and extra work items.
- F. The Construction Progress Schedule will be reviewed for conformance to the requirements of Section 01 32 00 and to verify at a minimum:
  - 1. Actual start and finish dates of completed activities since the last progress meeting
  - 2. Durations, progress, and productivity rates of all activities not completed
  - 3. Critical submittals/materials delivery problems
  - 4. Potential project delays
  - 5. Any activity behind schedule and the Contractor's plan to bring it back on schedule
  - 6. Coordination of system outage requests or access restrictions
  - 7. Labor and equipment availability
  - 8. Contractor readiness to implement contingency plans necessary to keep the project on schedule
  - 9. Potential impacts from District operation and maintenance activities
- G. If the logic of the submitted Look-Ahead Schedule deviates significantly from the current schedule, a reconciliation of the two schedules shall be required.
- H. The Engineer will prepare and distribute minutes of the meetings.
- I. Progress meetings may be conducted using remote meeting software applications such as Microsoft (MS) Teams, Zoom etc. at the option of the District. Contractor shall have equipment available for this remote communication.

### 1.3 FIELD TESTING COORDINATION MEETINGS

- A. Field testing coordination mandatory meetings (see Section 01 75 17, Article 3.3) will be required to coordinate detailed commissioning procedures for complicated work or work with high potential impact to operations and schedule with the contractor, subcontractors, and vendors. These meetings will be scheduled as needed by the Commissioning Engineer.

### 1.4 SUBMITTALS

- A. A combined three (3) week Look-Ahead Schedule with a one (1) week As-Constructed Schedule for the previous week shall be submitted by Contractor to Engineer for review and approval at each progress meeting. This Look-Ahead Schedule may be derived from the General Superintendent's notes in a format other than Primavera Project Planner; however, the Look-Ahead Schedule logic shall be a representation of the approved Baseline Construction Schedule or the approved Monthly Construction Progress Schedule logic, whichever is most current (i.e. activity identification numbers and descriptions). See Section 01 32 00 Construction Progress Documentation.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

## SECTION 01 32 00

### CONSTRUCTION PROGRESS DOCUMENTATION

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section includes:

1. Submit an Initial CPM Construction Schedule for the work with subschedules of related activities.
2. Submit updated Monthly Construction Progress Schedules after Notice to Proceed until contract completion.
3. The Contractor, and its subcontractors and suppliers shall email the Engineer directly at [Christian.Narvaez@ebmud.com](mailto:Christian.Narvaez@ebmud.com) for submission of all data and documents (unless specified otherwise) throughout the duration of the Contract. By submitting the Initial CPM Construction Schedule and each Monthly Construction Progress Schedule, the Contractor certifies that in the progress of preparing the initial contract schedule and the monthly updates, it has consulted with all key Subcontractors and suppliers, has incorporated all relevant scheduling information from the Subcontractors and suppliers, and has obtained their agreement that they will comply with the planned start dates, sequencing, durations and completion dates reflected in the Initial Construction Schedule and each monthly update. The Contractor, alone, is responsible for coordinating and scheduling all Work and is solely responsible for any claims from Subcontractors or suppliers arising from or related to the coordination and scheduling of their work.

##### 1.2 SUBMITTALS

- A. All schedules shall be created using Microsoft Project (latest version, CPM format), or Gantt style chart.
- B. Initial and Monthly Construction Progress Schedules shall be electronic copies of the schedules together with printouts of the associated supporting data. Submit the electronic copy as an email attachment and include both the electronic file in its native format and as an Adobe Acrobat (.pdf) copy.
- C. The Initial Construction Schedule shall be submitted within 10 work days after the Notice to Proceed.
- D. The Monthly Construction Progress Schedules shall be submitted before the 25th day of each month beginning with the month after submission of the Initial Construction Schedule.

- E. Submit all required schedules to the Engineer for review. Engineer will review the schedules and if unacceptable, return the review copy. If required by Engineer, Contractor shall make any changes or corrections required by Engineer and resubmit the schedule within 5 work days after receiving it from the Engineer. Contractor is solely responsible for any means, methods, coordination or scheduling of the Work regardless of any review or comment by Engineer.

### 1.3 DESCRIPTION

#### A. Initial Construction Schedule:

1. Prepare an Initial Construction Schedule with details as noted below.
2. The Initial Construction Schedule shall be a time-scaled computerized detailed task level diagram. A clear delineation of construction activities shall be shown on the Initial Construction Schedule. This schedule shall be cost loaded.
3. The work activities comprising the Initial Construction Schedule shall be of sufficient detail to ensure adequate planning and execution of the Work and such that the schedules provide an appropriate basis for monitoring and evaluating the progress of the Work. A work activity is defined as a singular task that requires time and resources (manpower, equipment, and/or material) to complete in a continuous operation (excepting submittal activities, review/approval activities, and fabrication and procurement activities). Work activities shall be clearly labeled to identify the scope of work involved and shall have measurable beginning and ending points. Activities labeled “start”, “continue” or “completion” without measurable increments of work will not be acceptable. No activity shall be less than one (1) nor more than fifteen (15) days in duration nor exceed \$50,000 in value for any on-site operation unless otherwise accepted in writing by the Engineer. This fifteen-day duration requirement does not apply to submittal preparation, submittal review, or fabrication and delivery of materials.
4. In the preparation of Initial Construction Schedule, Contractor shall take into account all constraints and requirements specified.
5. The project critical path consisting of Critical Work Activities shall be clearly shown and highlighted in red. Duration and logic connections for each activity shall be identified.
  - a. Critical Work Activities are defined as Work activities which, if delayed or extended, will delay the scheduled completion date of the Work. All other Work activities are defined as non-critical Work activities and are considered to have float.
6. Show the dates for the beginning and completion of each major element of construction conforming to all limitations listed.
7. Identify District activities necessary for completion of the Work.

8. Products availability schedule:
  - a. Show the fabrication, delivery and availability dates for contractor furnished equipment affecting the progress of the work.
9. Contractor shall provide the following information for all activities on the network diagram or in associated printouts and supporting information:
  - a. Activity identification numbers and description
  - b. Activity early start and early finish dates
  - c. Activity late start and late finish dates
  - d. Activity Float
  - e. Total Float
  - f. The predecessor and successor activities for each individual activity
  - g. Designation of the planned work day/work week for each activity including number of shifts per day
  - h. Scheduled manpower loading by trade for each activity
  - i. Production rates for major operations pipe installation
  - j. Scheduled resource utilization for each activity including major construction equipment. Subcontract work shall be clearly indicated.
10. The schedule shall include the project calendar(s) indicating all non-working periods and indicating all District Holidays that will be observed during construction.
11. The schedule shall indicate the sequence and interdependency of all work activities. Contractor shall not sequester float through strategies including extending activity duration estimates to consume available float, using preferential logic, using extensive or insufficient crew/resource loading, using Zero Total Float constraints or imposed dates. All activities shall be linked by finish-to-start (FS) relationships only. No other relationships including start to start, and finish to finish shall be permitted without prior written permission of the Engineer. If and only if approved, other relationships shall be clearly and explicitly identified. Constraints on activities shall be kept to a minimum, shall be explicitly identified, and are subject to the written permission of the Engineer. Positive lags on finish to start relationships and negative lags on start to start or finish to finish activities will not be permitted.

17. Specific items to be covered include, but are not limited to, the following:
  - a. Notice to Proceed and Notice to Commence Field Work
  - b. Mobilization
  - c. Abandonment of existing underground diesel tank
  - d. Demolition of above-ground tank
  - e. Installation of new tank and tank-monitoring system
  - f. Install electrical equipment
  - g. Electrical hook-up
  - h. Submit O&M manuals (preliminary and final) for approval
  - i. Equipment functional testing
  - j. Ready for service
  - k. Painting (if applicable)
  - l. Clean-up and demobilization
  - m. Submit final as-built and record drawings and O&M manuals including electronic copies
  - n. Contract completion
  
18. Failure by Contractor to include any element of the work required for the performance of this Contract and completion of the Work shall not excuse Contractor from completing all work required within the time for completion, notwithstanding Engineer's acceptance of the Initial Construction Schedule.
  - a. Show cost of each item. The Contractor shall allow the Engineer to review the as-built drawing sets and as-built log at the 25th day of each month to determine payment in accordance with the schedule of costs. The assigned cost for monthly preparation of as-built mark-ups shall be at least \$5,000 for each month.

PART 2 - NOT USED

PART 3 - EXECUTION

### 3.1 BASELINE SCHEDULE AND DELAY ANALYSIS

- A. If approved by the Engineer, the Initial Construction Schedule (including any revisions required based upon the Engineer's review), will be the Baseline

Construction Schedule for the Project. Engineer's Approval of the Baseline Construction Schedule is for conformance with contract requirements and does not relieve Contractor from its sole responsibility for means, methods, coordination or scheduling of the Work.

- B. Delay analyses will be based upon the Approved Baseline Construction Schedule or the latest approved Monthly Schedule in effect at the time of start of the alleged delay. No time extensions will be granted, nor delay damages paid until a delay occurs which extends the work beyond the contract milestones. In no event, however, will contract time be extended, or compensation granted, for potential delays that do not actually occur.
- C. The Baseline Construction Schedule shall be used by Contractor for executing the Work of the Contract, including planning, organizing and directing the Work, and reporting its progress until subsequently revised by a Monthly Construction Progress Schedule. No unilateral changes shall be made to the Baseline Construction Schedule or Monthly Construction Progress Schedule logic and activities without the prior approval and consent of the Engineer, excepting only the reporting of Actual Start, Actual Finish, and Activity Progress.
- D. Delays of any non-critical Work shall not be the basis for an extension of Contract Time until the delays consume the float associated with that non-critical Work activity and cause the Work activity to become critical. Contract Time will only be extended through written Change Orders signed by the Engineer or his/her designee.

### 3.2 FLOAT

- A. Total Float is defined as the difference, in work days, between the contract duration and the sum of the work day duration of the critical path activities.
- B. Total Float is not for the exclusive use or benefit of either the District or the Contractor, but is a resource available to and shared by both parties as needed to meet contract milestones and the contract completion date.
- C. In the event the Contractor submits a viable, contractually compliant construction schedule that indicates project completion at a date earlier than the contractually provided contract duration, the acceptance of such a schedule will not change the contract time. Instead, a schedule activity entitled "project float", of a duration equal to the difference between the proposed construction duration and the contract duration, will be added to the schedule and will be a resource available to and shared by both parties as needed to meet contract milestones and the contract completion date. The Contractor shall not be entitled to claim damages for expenses due to the Engineer not authorizing an early completion.
- D. District reserves the right to make changes to the Work that will reduce the amount of work to be performed, reduce the difficulty of the work, change performance, inspection or specification requirements, reduce work restrictions, or otherwise make changes to increase productivity. Any resulting reduction in delay, or increase

in float, are to be used first by the Engineer, in its sole discretion, to offset any existing or anticipated District-caused delays. Thereafter, any remaining float created will be a resource available to and shared by both parties as needed to meet contract milestones and the contract completion date.

### 3.3 MONTHLY CONSTRUCTION PROGRESS SCHEDULES

- A. Revise and submit Monthly Construction Progress Schedules to reflect actual progress to date and any changes in the plan to complete the work. Identify the first Monthly Construction Progress Schedule update as Revision 1 and number sequentially thereafter. The Monthly Construction Progress Schedule will contain all of the information required in the Initial Construction Schedule and the following:
  - 1. District directed work and Approved Change Orders including weather delays granted that affect Schedule logic, durations, milestones or add or delete activities.
  - 2. Actual Start and Finish dates for each activity started or finished since the last monthly update.
- B. For Monthly Construction Progress Schedules, include:
  - 1. A comparison between the current update and the Baseline Construction Schedule or previously accepted Monthly Construction Progress Schedule. Revisions and updated information shall be clearly highlighted. Include agreed revisions as discussed in the Weekly Progress Meetings. See Section 01 31 19 Project Meetings.
  - 2. Submittal of the monthly reports and schedule updates by Contractor are required regardless of the approval status of the Baseline Construction Schedule or any monthly revision to the Baseline Construction Schedule.
- C. Provide a printed listing of any activities that have been added or deleted, or modifications to the schedule logic and dependencies, changes to planned activity durations, resources and quantities, and early-start and late finish dates or other change in the means and methods for performing the work which result in changes to the order, sequence, duration, or number of planned activities, or to the planned schedule logic. Do not change activity IDs or reuse activity IDs from deleted activities.
- D. Provide a narrative report as needed to define:
  - 1. Work completed since the last update and a list of activities clearly showing revised percent complete and actual start and finish dates and a description of overall project status
  - 2. Description of the current critical path, including changes to the critical path since the last update and a summary of days gained or lost on the critical path



3. Other changes in construction sequence
  4. Problem areas, including identification of activities where actual progress has lagged planned progress as well as anticipated delays, reference to pending change orders as appropriate and other possible impacts on the schedule
  5. For any anticipated delays, indicate:
    - a. Cause of the delay
    - b. Corrective action and schedule adjustments to correct the delay, including a detailed listing of labor, additional crews, overtime, additional supervision, equipment, materials, and material expediting for recovering lost progress on critical activities
    - c. Known or potential impact of the delay on other activities and milestones
  6. Status of pending items, including pending change orders, time extension requests, and other issues relating to contract time
  7. Contract Completion Date Status, including number of calendar days behind or ahead of schedule
- E. As a condition precedent to final acceptance of the Work, submit a final As-Constructed Schedule and all final reports which accurately reflect the manner in which the Work was constructed and includes actual start and completion dates for all work activities on the Baseline Construction Schedule.

END OF SECTION

## SECTION 01 35 24

### PROJECT SAFETY REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Contractor is solely and exclusively responsible for maintaining job-site safety and compliance with all pertinent Groups and Articles set forth in Title 8, California Code of Regulations (Cal/OSHA), and Title 29, Code of Federal Regulations (OSHA; where applicable).
- B. Contractor shall be the Creating, Controlling, and Correcting Employer for purposes of compliance with Cal/OSHA's multi-employer worksite rule (8 CCR 336.10) for all work and workers associated with the project.
- C. Contractor and subcontractor workforce shall have sufficient experience and training to perform the work of the contract demonstrated by training, certifications, licensing, and permits. This includes specialized work related to OSHA and EPA requirements.
- D. Meet with the Engineer prior to commencement of the Work to review the project safety requirements as applicable to the Contractor's procedures and to develop mutual understandings relative to compliance with the safety requirements and administration of the Contractor's project safety programs.
- E. Obtain and post permits required by 8CCR section 341.
- F. Site Activities
  - 1. Complete a Safe Work Permit prior to starting work at a Water Treatment Facility. See Appendix A.
  - 2. Provide Safety Equipment & Training for specified topics herein as required.
  - 3. Establish weekly tailgate/toolbox meetings to inform workers of construction site hazards and planned activity.
  - 4. Control exposure to harmful dusts, fumes, mists, vapors and gases at the project site or location, regardless of employer, so that respective permissible exposure limits (PEL) established by Title 8, California Code of Regulations (Cal/OSHA) are not exceeded. Control guidance includes but is not limited to:
    - a. Cal/OSHA Article 4 – Construction Airborne Contaminants (all)
    - b. Cal/OSHA Article 107 – General Industry Airborne Contaminants (Section 5155 emphasis)

- c. Cal/OSHA Article 110 – Regulated carcinogens
  - d. Cal/OSHA Article 111 – Fumigation
5. Control exposure to harmful radiation at the project site or location, regardless of employer, so that respective permissible exposure limits (PEL) established by Title 8, California Code of Regulations (Cal/OSHA) are not exceeded. Control guidance includes but is not limited to:
- a. Cal/OSHA Article 34 – Nonionizing Radiation (lasers)
  - b. Cal/OSHA Article 103 – Actinic (ultraviolet) radiation
  - c. Cal/OSHA Article 104 – Nonionizing (radiofrequency and microwave) radiation
6. Physically delineate and assign work areas and restrict access by unauthorized persons during the course of work. See Section 01 35 53 – Security Procedures for sign-in requirements.
7. Provide and post safety signs at project/property entrances and hazard control areas including but not limited to:
- a. Requirements for personal protective equipment (hard hats, safety shoes, reflective vests, safety glasses, respiratory protection, etc.)
  - b. Access or prohibition to demolition work areas
  - c. Restrictions for confined space operations
  - d. Restrictions for tunnel work and access
8. Unsafe tools, equipment, or machinery shall not be brought onto the project. Unsafe tools, etc. shall be considered as those tools which are in need of repair, replacement, lacking proper maintenance, or are unsuitable for the task. This also includes tools and equipment not used in accordance with manufacturer guidance.
9. Assemble, install, erect, and prepare safety related equipment, devices, and products in accordance with manufacturer specifications CMI and recommendations. Manufacturer documentation shall be provided to the Engineer upon request.
10. Comply with:
- a. Department of Transportation (DOT) testing regulations (49 CFR Part 32)
  - b. CA State Vehicle Code (Section 34520)

c. All applicable legally valid rules and regulations regarding drug and alcohol misuse, including consumption, sale or possession

11. Firearms, explosive devices, and other dangerous weapons are prohibited on District property or while engaged in contract Work.

12. Safe access shall be provided for construction inspectors and other authorized District employees in order to inspect or review Work in progress.

G. Related Sections

1. Section 01 14 00 – Work Restrictions

2. Section 01 35 44 – Environmental Requirements

3. Section 01 50 00 – Temporary Facilities and Controls

1.2 DEFINITIONS

A. Where used in the Contract Documents, the following words and terms shall have the meanings indicated. The meanings shall be applicable to the singular and plural of the words and terms.

1. Cal/OSHA: California Occupational Health & Safety Administration

2. Competent Person: As defined in Section 1504 of the Construction Safety Orders, Title 8, California Code of Regulations

3. Confined Spaces: Any space not designed for human occupancy and having the characteristics identified in Title 8, California Code of Regulations (Cal/OSHA), Article 108 – Confined Spaces

4. Excavation: Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal

5. Exposure Assessment: An assessment of potential biological, chemical, physical, and radiological hazards encountered on the project site. Often a Job Hazard Analysis, Task Hazard Analysis, or Activity Hazard Analysis

6. Hazard: Any source of potential damage, harm or adverse physical and/or health effects to someone.

7. Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

a. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL)

- b. Airborne combustible dust at a concentration that meets or exceeds its LFL
  - c. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent
  - d. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Article 4 of the Construction Safety Orders and Group 16 of the General Industry Safety Orders
  - e. Any other atmospheric condition that is immediately dangerous to life or health
8. Hazardous Energy Control Procedure (HECP): A procedure to implement hazard energy control and isolation in accordance with Lock-Out Tag-Out as defined by Title 8, California Code of Regulations, § 3314
  9. Hazardous Substance: Any substance included in the list (Director's List) of hazardous substances prepared by the Director, California Department of Industrial Relations, pursuant to Labor Code Section 6382. Includes hazardous waste
  10. Hot Work Permit: Electric or gas welding, cutting or brazing, wire or grinding wheel, or any extreme heat, flame or spark producing equipment, procedures or operations.
  11. Isolate or Isolation: The process or mechanism by which employees are completely protected against the release of energy, material, and contact with an identified hazard(s), by such means as:
    - a. Blanking or blinding
    - b. Misaligning or removing sections of lines, pipes, or ducts
    - c. A double block and bleed system
    - d. Lockout or tagout of all sources of energy
    - e. Blocking or disconnecting all mechanical linkages; placement of barriers to eliminate the potential for employee contact with a physical hazard
  12. Lock-Out Tag-Out (LOTO): As defined by Title 8, California Code of Regulations, § 3314.
  13. Order Prohibiting Use (OPU): A tag affixed to a dangerous workplace condition or practice which constitutes an imminent hazard to workers. An OPU tag may be posted prohibiting:
    - a. Entry to the worksite, or part of the worksite

- b. Use of machinery, devices, or apparatus
14. Permit-Required Confined Space (permit space): A confined space that has one or more of the following characteristics:
- a. Contains or has a potential to contain a hazardous atmosphere
  - b. Contains a material that has the potential for engulfing an entrant
  - c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section
  - d. Contains any other recognized serious safety or health hazard
15. Safe Work Notice: A notice required to be completed by the Contractor and District staff used at a wastewater treatment plant. The notice communicates work to be performed, the areas and potential hazards. Work may proceed once each safe work notice category is satisfied.
16. Safe Work Permit: A permit required to be completed by the Contractor and District staff used at a water treatment plant. The permit communicates work to be performed, the areas of work, and potential hazards of the work.
17. Shutdown: An interruption in operation of the main wastewater treatment plant or remote facilities (including pumping plants) that results in planned interruption and de-energization of parts or the entire facility
18. System Outage/System Outage Request (SOR): A documented procedure and request to remove one or more facility system(s) from service, and a documented request for contract work that impacts wastewater plant systems and operations. An SOR is typically associated with a Safe Work Notice or a Safe Work Permit.
19. Trench: As defined by CAL-OSHA Title 8 California Code of Regulations

### 1.3 SUBMITTAL OF PLANS AND PROCEDURES

#### A. General

- 1. The plans and procedures shall be kept current.

#### B. Project Health & Safety Plan

- 1. Submit a Project Health & Safety Plan for the Work to be performed prior to start of the Notice to commence field work (NTCFW) and/or prior to any limited notice to commence field work (LNTCFW).

2. The Project Health & Safety Plan shall implement applicable Title 8, California Code of Regulations for the work performed.
- C. Submit the name of individual(s) & contact information prior to start of Work who are designated as:
1. Project Health & Safety Representative
  2. Competent/Qualified Persons for:
    - a. Diving operations
    - b. Fall arrest systems and equipment
    - c. Fall prevention: guardrail, delineators, holes & openings guards, etc.
    - d. Ladder use and inspection
    - e. Manlift operations
    - f. Crane operations
    - g. Scaffold erecting and inspection
    - h. Structural safety and demolition plans
    - i. Trench and excavation inspection
    - j. Trench and excavation protective system design
    - k. Confined space supervisor
    - l. Tunnel safety certified gas tester
    - m. Tunnel safety competent person
    - n. Qualified person to take air samples and measurements that determine and mitigate/eliminate airborne contaminant exposures in conformance with Title 8, California Code of Regulations
- D. Submit a Project Injury & Illness Prevention Plan (IIPP).
- E. Submit an Emergency Action Plan that prepares responses to employee accident/injury events, or any serious unplanned event (e.g.: utility break, fire, structure collapse, etc.) that requires notifying any first aid provider or response agencies (e.g.: fire departments, utility agencies, rescue teams, etc.)
1. Plan shall include a map to medical facilities that are capable of caring for worker accidents & injury.

2. Plan shall include emergency contact numbers.
- F. Submit a Job Hazard Analysis (also known as Task Hazard Analysis, or Activity Hazard Analysis) for work performed.
  - G. Submit a Demolition Plan for the scope of work determined in the specification and for additional work required.
  - H. Submit a Fall Protection plan/procedures to the Engineer for review prior to any work at heights at the jobsite.
    1. The fall protection plan shall address protective measures for fall and elevation hazards including but not limited to:
      - a. Ladders
      - b. Scaffolds
      - c. Manlifts
      - d. Steep slopes and embankments
      - e. Floors holes, and other openings at walking surface level, including open pits and vaults
      - f. Work near trench and excavation
      - g. Structures in progress of construction, modification, or repair
      - h. Prevention of material or tools that may be dropped or dislocated and fall from a higher elevation
    2. The plan shall address specific safety measures, including PPE and engineering controls for work occurring at heights greater than 7-1/2 feet.
    3. Procedures shall conform to applicable provisions of Sections 1669 through 1671.2, Title 8, California Code of Regulations.
    4. The plan/procedures shall address rescue of workers who may fall.
  - I. LOTO (Lock-Out Tag-Out)
    1. The Contractor and subcontractors shall share and coordinate LOTO plans and determine how such plans are implemented on District equipment, process, or machinery to be isolated.
    2. The distinction between LOTO (to be performed by the Contractor) and operational shut-down (to be performed by the District) shall be made.
    3. LOTO plan shall include:



- a. LOTO locations (machine, equipment, process, etc.)
  - b. Lock-out and tag-out methods and equipment
  - c. De-energization and/or isolation state (off, open, closed, etc.)
  - d. Verification of de-energization and/or isolation state
  - e. Log of locked and tagged locations
  - f. Stated emergency types and breach policy
  - g. Return-to-service sequence, practice and removal of lock and tags
- J. Submit a detailed Tunnel Safety Plan in conformance with Title 8CCR Subchapter 20 Tunnel Safety Orders, for any work in tunnels, shafts, raises, inclines, underground chambers, and premises appurtenant thereto during excavation, construction, alteration, repairing, renovating or demolishing, and/or any of the following:
- 1. Cut-and-cover operations characteristic of underground construction
  - 2. Boring and pipe-jacking operations 30 inches in diameter or greater in size
  - 3. Pipelines which are connected to and/or are an integral part of a tunnel where persons are working inside and the conditions are similar to a lined tunnel construction or repair project
  - 4. All shaft excavations intended to exceed 20 feet in depth where employees may enter the shaft and/or approach the shaft area
  - 5. The plan shall include:
    - a. CAL/OSHA Tunnel Classification with noted special conditions
    - b. Air Monitoring
    - c. Ventilation
    - d. Illumination
    - e. Communications
    - f. Ground Control
    - g. Flood Control
    - h. Mechanical Equipment
    - i. Crane operation/man basket use/current certification

- j. Elevation hazards and fall protection
- k. Surface work activity restrictions
- l. Personal Protective Equipment (including self-rescue breathing devices)
- m. Explosives (if any determined)
- n. Fire Prevention and Protection
- o. Emergency Procedures, including evacuation plans and a check-in/check-out system
- p. First aid and medical
- q. SOR/LOTO procedure, controls & isolation
- r. Diving operations
- s. Location and use of Project Safety Bulletin Board
- t. Determination of the required pre-work job safety conference with CAL/OSHA representatives

K. Electrical Safety Plan

- 1. Submit a detailed electrical safety plan that is in accordance with NFPA 70E Article 110. The plan shall include at a minimum:
  - a. Electrical hazard potential
  - b. Electrical safety program principles per Annex E.1 of NFPA 70E
  - c. Electrical safety program controls per Annex E.2 of NFPA 70E
  - d. Electrical safety program procedures per Annex E.3 of NFPA 70E
  - e. Risk assessment and risk control procedures per Annex F of NFPA 70E
  - f. Job briefing and planning checklists per Annex I of NFPA 70E
  - g. Auditing effectiveness of project electrical safety program

L. Excavation Safety Plan:

- 1. Section 6705 of the Labor Code requires that the excavation of any trench 5 feet or more in depth shall not begin until the Contractor has received from the Engineer notification of the Engineer's acceptance of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation of such trench.

- a. The plan shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during such excavation.
  - b. The plan shall meet the requirements of the Construction Safety Orders, Title 8, California Code of Regulations.
2. Contractor shall obtain an excavation permit per Cal/OSHA Title 8, CCR § 341(a)(1).
  3. California Government Code § 4216 describes the requirements and procedures for excavation notifications and utility excavation.

M. Threat to Public Health Response Plan

1. The Contractor shall submit a plan outlining worker safety to be in compliance with OSHA guidelines, local, county, and state jurisdiction for a threat to public health event including the following:
  - a. Designate a Site Safety Representative (SSR) to monitor and implement all recommended safety practices regarding any threat to public health with all Contractor staff members. Labor supervisors shall have the authority, through consultation with the SSR, to halt all activities that do not adhere to the safety practices. The SSR shall have training commensurate with this hazard and all required industrial hygiene practices that may be required on the job site. This person shall be responsible to maintain supplies of appropriate disinfectants and make sure that workers follow decontamination, hand washing, distancing, and PPE rules.
  - b. Employee Screening: Establish an assembly point for staff and daily screening protocol before the start of work each day that complies with the recommended social distancing parameters. If workers leave and re-enter the work site during the shift, re-screen individuals prior to re-entry into the work site.
  - c. Informational Meetings: Provide a daily tailgate session reviewing site protocols to mitigate potential spread of the infection. Tailgates should occur daily and contractors should document attendance and require worker signatures.
  - d. Personal Protective Equipment (PPE): Employ a task-specific Job Hazard Analysis (JHA). Establish the level of PPE required for each specific task. This is especially important for tasks that may require staff to work inside of the recommended social distancing zone.
  - e. Disinfection Procedures: The Contractor shall clean and sanitize trailers, toilets and other enclosed spaces. Establish deep cleaning schedules on

job sites to address exposed surfaces. Areas that require a cleaning schedule shall include, but not be limited to: trailer/office spaces, elevators and lifts, operating equipment, electrical equipment, restrooms, and other “high touch” areas of the job site. The Contractor shall allow adequate time for proper cleaning and disinfection each day. In addition, the Contractor shall establish a cleaning and decontamination protocol prior to entry and exit of the job.

- f. Hand Washing Stations: Provide hand washing and sanitizing stations throughout the job site to provide for regular hand cleaning. Sanitizer used shall be appropriate for the control of the infection of concern. Stations should be of sufficient quantity to allow staff to remain within the work areas without exiting into break areas, and shall be maintained continuously.
  - g. Social Distancing Guidelines: Include a procedure to reduce contact between employees using social distancing. This procedure shall include progress meetings and how to hold these meetings while maintaining social distancing.
  - h. Sick Employee Action Procedures: Identify response procedure and disinfection if a field staff (Contractor’s staff, its subcontractors’ staff, and District field staff) is sick or symptomatic, including quarantine duration, notification procedures and a field staff return to work procedure. This Sick Employee Action Procedures shall also include back-up personnel for all critical staff.
  - i. For work sites where the Contractor, multiple subcontractors, and District staff share the same work space, inform all parties about all site-specific infection Site Specific Health and Safety Plan requirements. Where one contractor enters the space of another contractor, the most stringent requirements shall be followed.
- 2. The Engineer may require the Contractor to submit an updated Threat to Public Health Response Plan to conform with District practices as they are updated.
  - 3. Contractor shall draft and implement a Code of Safe Practices which will at a minimum, require staff, subcontractors, suppliers, etc. to comply with the following guidelines during the course of their work:
    - a. If you feel sick, and/or have been exposed to anyone who is sick, stay at home. You may be required to provide medical clearance before being allowed to return to work.
    - b. To ensure proper sanitation, the safe practices should include the following, or what is recommended by the CDC or other governmental authority having jurisdiction:

- 1) Wash hands frequently for at least 20 seconds with soap and water. Avoid touching your face with un-sanitized hands. Avoid touching common surfaces with bare hands.
- 2) Observe your work distances in relation to other staff. Maintain the recommended distance at all times when not wearing the necessary PPE for working in close proximity to another person.
- 3) Do not shake hands or make other direct contact with other staff.
- 4) Do not carpool with other staff unless they are family members living within your household.
- 5) Do not share phones. Use of microwaves, water coolers and other similar group equipment for breaks are suspended during a Threat to Public Health event, unless sanitized between uses.
- 6) Clean personal tools prior to use, as well as group tools.
- 7) If your task requires working in close proximity to another person, review the required JHA to ensure you are equipped with the proper PPE and are trained in and understand the directions for use. Do not start any task until you have been properly equipped and trained on procedures.
- 8) Ensure you clean and maintain your personal PPE and do not loan any items out to other staff.
- 9) Disposable PPE, paper towels, and similar waste must be deposited in non-touch waste bins.
- 10) Do not cough or sneeze into your hand; rather, direct coughs and sneezes into the crook of your arm at your elbow; follow established CDC guidelines.
- 11) Workers should change work clothes and shoes prior to arriving at home. All clothing should not be shaken out. Launder work clothes separate from other laundry.

N. Submit USA Marking Record

1. Submit utility locate and marking (USA marking) number and documents, and verification of markings.
2. Make available to the Engineer the record of all subsequent utility marking events and meetings on the project.

O. Accident Reports

1. Complete and submit a report when any injury or event described in section 1.3.E occurs. See Article 3.3 for reporting requirements.

#### 1.4 TRAINING AND QUALIFICATIONS REQUIREMENTS

- A. Ensure that all personnel who, as the result of work on this contract, will likely be exposed to hazardous conditions or hazardous substances at the site have received the appropriate training for the hazards they may encounter. Establish minimum training requirements and do not allow untrained workers to enter or perform Work at the site.
- B. Submit certification of current training & qualification for each worker engaged in work with hazardous conditions or hazardous substances.

#### 1.5 WATER TREATMENT SAFETY VIDEO

- A. All Contractor personnel shall view the water treatment plant safety video provided by the District prior to working at water treatment facilities.

### PART 2 - PRODUCTS

#### 2.1 SAFETY EQUIPMENT

- A. General
  1. Safety equipment and systems shall be not less effective than the requirements of Title 8, California Code of Regulations and related recognized authority standards such as NFPA, NEC, ASTM, etc.
- B. Furnish safety equipment for Tunnel Operations, including but not limited to escape respirators.
- C. Furnish adequate confined space rescue equipment and staff to support permit required confined space operations.
- D. Furnish ANSI Z358.1-1981 or better eyewash for corrosive & irritant exposures.

#### 2.2 INDUSTRIAL HYGIENE EQUIPMENT

- A. Supply and utilize necessary industrial hygiene and safety equipment to perform work safely within the scope of the contract.
- B. Perform dust screening to determine hazard exposure.
- C. Survey noise to determine hearing protection levels.

## PART 3 - EXECUTION

### 3.1 PROJECT HEALTH AND SAFETY PLAN

#### A. General

1. The Project Health & Safety Plan shall be made available electronically.
2. A hard copy of the Project Health & Safety Plan shall also be available on-site.
3. The Project Safety and Health Plan shall apply to all personnel working at, or visiting the site including, but not limited to, Contractor's employees, suppliers, truckers, and District personnel.
4. The Project Health & Safety representative shall verify that all persons are in compliance with applicable safety and health requirements, and take action to ensure compliance where deficiencies are identified.
5. Take representative personnel air samples for employee exposure to dust, fume, mist, and vapors of materials and substances brought onto the project or generated during the course of Work on the project. Paragraph 3.1.B provides sampling guidance.
  - a. Representative samples shall be used to determine confined space classification for blasting and coating operations.
6. Exercise extreme care when handling or disposing of materials or substances that are listed as hazardous substances in Section 339 of Chapter 3.2, California Occupational Safety and Health Regulations, Title 8, California Code of Regulations, or in Title 26 (Toxics) of the California Code of Regulations, or as evidenced by the manufacturer's Safety Data Sheet (SDS).
7. Complete the Pre-work Project Jobsite Survey at the end of this Section prior to work subject to Cal/OSHA's Construction Safety Orders.

#### B. Sampling and Testing of Samples Collected for Exposure Analysis

1. Sampling shall be conducted by qualified persons.
2. Sample testing shall be performed by nationally accredited certified laboratory.
3. Sample results shall be made available to the Engineer and Workplace Health & Safety Section within 5 days.
4. Provide chain of custody for each sample or sample set.
  - a. Sample results shall be report the time weighted average for each sample taken for occupational exposure.

- b. Sample data shall be in electronic form that can transfer to the District's Laboratory Information Management System (LIMS), for example MS-Excel, or other readily exportable format.

### 3.2 HAZARD CONTROL

#### A. General

1. The Engineer or District Safety representative may suspend or stop Work, notify Cal/OSHA, or both if observations/inspection of project work and work locations are in not in conformance with Title 8CCR Code of Regulations, and/or safety submittals, work plans and job hazard analyses.

- B. Meet and satisfy the requirements outlined in the checklists identified herein and at the end of this section for project safety controls.

#### C. Demolition

1. Limit access to demolition areas.
2. Ensure structural demolition adheres to demolition plan.
3. Ensure access and work on structures planned for demolition or in progress of demolition are evaluated by a qualified person for safety.

#### D. Excavation Safety

1. A walkway or bridge, with standard guardrails, shall be provided where employees are required to cross excavations and trenches 6 feet or greater in depth per Section 1541 of the Construction Safety Orders, Title 8, California Code of Regulations.
2. The Contractor shall secure all open trenches at the end of each work day for public safety and security with chain link fence or steel plates to prohibit access to the open trench.

#### E. Electrical

1. For work in which the Contractor must install temporary electrical circuits:
  - a. An electrical safety assessment (that includes ARCFLASH) shall be performed and provided to the Engineer.
  - b. The assessment shall be based on the latest NFPA 70E Standard
  - c. Appropriate hazard labeling shall be provided.
2. For work in which the Contractor installs electrical circuits required by the specification:



- a. An electrical shock and ARCFLASH assessment shall be performed in accordance to the latest NFPA 70E Standard on installed equipment.
- b. Appropriate labels shall be made and installed on equipment rated in excess of 480V (for example MCC, switchboards, panelboards, industrial control panels, etc.).
- c. Prior to labeling, the label shall be reviewed by the Engineer for acceptance.

F. Confined Space Procedures

1. Evaluate each confined space and post the classification.
2. Ensure hazardous energy is controlled and isolated (LOTO).
3. Confined spaces designated (classified) as PERMIT REQUIRED shall be supported by a rescue team.
4. Documentation shall be maintained for the duration of the contract.
5. Documentation shall be submitted to the Engineer and District safety representative upon conclusion of project site work.
6. Ignition sources are prohibited within 5 meters of confined spaces and confined space operations; exception:
  - a. Equipment and tools explicitly designed for potentially hazardous confined space work.
7. Fuels and combustible materials are prohibited within 5 meters of confined spaces and confined space operations.
8. Smoking is prohibited within 5 meters of confined spaces and confined space operations.
9. Confined space procedures for pipe, aqueduct, wastewater interceptors and channels
  - a. Apply the Confined Space Procedures guidelines above and:
    - 1) Provide rescue team for entrant where entrant cannot effectively egress unaided.
    - 2) Excavation and other heavy equipment use is prohibited in proximity to entry location.

G. Fire Prevention and Protection

1. Perform all Work in a fire-safe manner and supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. Comply with applicable federal, local, and state fire-prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standards for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.
2. A long-handled, round-point shovel, or a fire extinguisher shall be kept at an accessible (unlocked) location on the construction site at all times.
3. Earthmoving and portable equipment with internal combustion engines shall be equipped with a spark arrestor to reduce the potential for igniting a wildfire. Such equipment shall be maintained to ensure proper functioning of spark arrestor.
4. For all work occurring between April 1 and December 1, or any other periods during which a high fire danger has been identified:
  - a. Equipment that could produce a spark, fire, or flame shall not be used within 10 feet of any flammable materials.
  - b. Portable tools powered by gasoline-fueled internal combustion engines shall not be used within 25 feet of any flammable materials.
5. Vegetation management for fire prevention and protection
  - a. Prior to and during construction:
    - 1) Create and maintain a defensible space (100 feet or to the District property boundary, whichever is shorter) around construction site, construction ingress and egress sites through landscaping, mowing, disking, and/or spraying dry brush or native grasses to a height of 4-inches or less.
    - 2) Remove dead trees within 100-feet of construction site.
    - 3) Limb up trees within 100 feet of construction site so that no leafy foliage, twigs or branches are within 5-feet of the ground. To maintain tree health, tree limbing shall not remove more than 25 percent of a tree canopy within one growing season.
    - 4) Ensure and maintain 5-feet of vertical clearance between roof surfaces and portions of trees overhanging all structures within construction site, and keep roofs free of leaves, needles, twigs, and other combustible matter. To maintain tree health, tree limbing shall not remove more than 25 percent of a tree canopy within one growing season.

5) Keep all overhanging trees, shrubs, and other vegetation, or portions thereof, free of dead limbs, branches, and other combustible matter.

b. Neatly stack all combustible materials away from structures within construction site and have all combustible growth cleared 15-feet around the stack.

6. During construction, maintain an unobstructed horizontal clearance at access drives of not less than the required width of the access drives, and an unobstructed vertical clearance of not less than 13 feet 6 inches above all roadways.

#### H. Pardee Section Safe Clearance Procedure Training

1. Schedule time to review and implement the Pardee Section Safe Clearance Procedures with the Engineer.

### 3.3 ACCIDENT REPORTS

A. Report injuries to the Engineer upon occurrence and incident response. Examples of reportable injuries include but are not limited to: broken limbs, amputation, chemical exposure, etc.

1. Contractor is solely and exclusively responsible for notifying Cal/OSHA within 8-hours of the occurrence of a serious injury or fatality. Copies of all related Cal/OSHA correspondence shall be reported to the Engineer.

2. Reports shall document the root cause(s) of the accident, and how the accident will be prevented from reoccurring. Furnish further information to the Engineer as requested.

B. Report all accidents/incidents to the Engineer arising out of, or in connection with, the performance of the Work whether on, or adjacent to the site, giving full details and statements of witnesses. Examples include but are not limited to property damage, heavy equipment accidents, trench collapse, structural failure, chemical release or spill, accidental water release.

1. Reports shall document the root cause(s) of the accident, and how the accident will be prevented from reoccurring. Furnish further information to the District as requested.

C. If a claim is made by anyone against the Contractor or any subcontractor on account of any accident/incident, arising out of or in connection with the performance of the contract, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

D. Notify the Engineer if Cal/OSHA arrives at the job-site for any purpose, including inspections, consultations, or investigations.

- E. Notify the Engineer if any other regulatory agency arrives at the job-site for any purpose, including inspections, consultations, or investigations.
- F. Notify the Engineer if any emergency response agency or first aid provider is summoned or arrives on the project site.

#### 3.4 SUPPLEMENTS

- A. The following supplements follow the END OF SECTION and are a part of this section:
  - 1. Excavation – Trench Daily Inspection form
  - 2. Hot Work Permit checklist
  - 3. Confined Space Specification checklist
  - 4. Pre-work Project Jobsite Survey
  - 5. COVID-19 Vaccination

END OF SECTION

## SECTION 01 35 44

### ENVIRONMENTAL REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Work includes:

1. Comply with applicable Federal, State and Local environmental regulations in the execution of the Work.
2. Meet with the Engineer prior to commencement of Work to review the project environmental requirements, permits, and issues.
3. Procure and pay for all necessary local, state, and federal permits to perform the Work.
4. Implement all required environmental plans, procedures, and controls during performance of the Work.
5. Characterize all wastes and imported backfill materials per Contract Documents.
6. Handle and dispose of all wastes, including Hazardous Wastes, in a proper and lawful manner.
7. In the event of a conflict or inconsistency between this Section and any provisions of the Contract Documents, the more stringent provision shall prevail.

###### B. Site Activities

1. Protect storm drains and surface waters from impacts of project activity.
2. Store materials and wastes such as demolition material, soil, sand, asphalt, rubbish, paint, cement, concrete or washings thereof, oil or petroleum products, or earthen materials in a manner to prevent it from being washed by rainfall or runoff outside the construction limits.
3. Reuse or dispose of excess material consistent with all applicable legal requirements and disposal facility permits.
4. Clean up all spills and immediately notify the Engineer in the event of a spill.
5. Equip stationary equipment such as motors, pumps, and generators with drip pans.

6. Divert or otherwise control surface water and waters flowing from existing projects, structures, or surrounding areas from coming onto the work and staging areas. The method of diversions or control shall be adequate to ensure the safety of stored materials and of personnel using these areas.
7. Following completion of Work, remove ditches, dikes, or other ground alterations made by the Contractor. The ground surfaces shall be returned to their former condition, or as near as practicable, in the Engineer's opinion.
8. Prevent visible dust emissions from leaving the work areas.
9. Maintain construction equipment in good operating condition to reduce emissions.
10. Handle, store, apply, and dispose of any chemical or hazardous material used in the performance of the Work in a manner consistent with all applicable federal, state, and local laws and regulations.

#### C. Related Sections

1. Section 01 14 00 – Work Restrictions
2. Section 01 35 24 – Project Safety Requirements
3. Section 01 50 00 – Temporary Facilities and Controls
4. Section 01 74 05 – Cleaning

#### 1.2 ACRONYMS

AMS	Alternative Management Strategies
ARARs	Applicable or Relevant and Appropriate Requirements
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practices
CCR	California Code of Regulations
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CIH	Certified Industrial Hygienist
CUC	Clean Utility Corridor
DTSC	Department of Toxic Substances Control
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
MMRP	Mitigation Monitoring and Reporting Program
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units

OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
PPMRP	Practices and Procedures Monitoring and Reporting Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SMARTS	Storm Water Multi-Application and Report Tracking System
SOP	Standard Operating Procedure
SOW	Scope of Work
STLC	Soluble Threshold Limit Concentration
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCLP	Toxicity Characteristic Leaching Procedure
TTLC	Total Threshold Limit Concentration
TWW	Treated Wood Waste
USEPA	United States Environmental Protection Agency
WDR	Water Discharge Requirements

### 1.3 DEFINITIONS

- A. Characterization: Identification of chemical, microbiological, or radiological constituents of solid and liquid wastes. Characterization typically involves sampling and analysis performed by a laboratory that complies with and is certified under the Environmental Laboratory Accreditation Program (ELAP) of the State Water Resources Control Board for the purposes of classifying a waste as hazardous, non-hazardous, or other classification.
- B. Construction and Demolition Waste (or Debris): Materials resulting from construction, remodeling, repair, or demolition operations on any structure.
- C. Contamination: Any confirmed or anticipated release, spill, or emission, of any substance in the air, soil, surface water, or groundwater which may constitute a risk to the environment or human health. Note: Naturally occurring substances, such as asbestos, arsenic and chromium, may also be considered contaminants if they constitute a risk to human health.
- D. Divert/Diversion: The use of waste (or debris) for any purpose other than disposal in a landfill, incineration facility, or alternative daily cover. Methods to divert materials from landfills include reuse, salvage, and recycling.
- E. Excavation Soils: Material resulting from any excavation (cut, cavity, trench, or depression in the earth's surface formed by earth removal)
- F. Hazardous Waste: A waste or combination of wastes as defined in 40 CFR 261.3, or regulated as hazardous waste in California pursuant to Division 4.5, Title 22, California Code of Regulations, and Chapter 6.5, Division 20, California Health and Safety Code.

- G. Qualified Environmental Professional(s): A person with working knowledge of Federal, State, and local laws and regulations governing environmental compliance including hazardous materials management and disposal requirements. A person also with experience conducting environmental investigations including applicable methods and techniques of environmental sampling, analysis, and modeling.
- H. Sanitary Sewer Discharge: Any discharges to a sanitary sewer system, including the EBMUD collection system
- I. Staging Area: That area shown on the plans for the use of the contractors where construction related activities will occur, including long-term and short-term equipment storage and maintenance, materials storage (both temporary and long term), parking, office space, etc.

#### 1.4 SUBMITTALS

##### A. Storm Water Management

###### 1. Storm Water Management Plan

- a. Submit a Storm Water Management Plan that describes measures that shall be implemented to prevent the discharge of contaminated storm water runoff from the jobsite. Contaminants to be addressed include, but are not limited to soil, sediment, concrete residue, pH less than 6.5 or greater than 8.5, and any other contaminants known to exist at the jobsite location.
- b. .

##### B. Water Control and Disposal Plan:

- 1. Submit a detailed Water Control and Disposal Plan that complies with all requirements of the Specification and includes provisions for the types of discharges and permits in a through c below, if applicable to the project.
  - a. Non-Stormwater Discharges
    - 1) Plan shall describe measures for containment, handling, treatment (as necessary), and disposal of discharges such as groundwater (if encountered), runoff of water used for dust control, stockpile leachate, tank heel water, wash water, sawcut slurry, test water and construction water.
  - b. Sanitary Sewer Discharges
    - 1) Plan shall describe required applications and/or permits from the sanitary sewer system owner or agency having jurisdiction regarding the planned discharge.



- a) Outline monitoring and reporting expected to support sanitary sewer discharge, including a sampling and analysis plan required in Paragraph 1.4.J. All monitoring results shall be submitted to the Engineer prior to the end of the Work.

C. Waste Management:

1. Prepare a Waste Management Plan and submit a copy of the plan for the Engineer's acceptance prior to start of work (except for water wastes which shall be addressed in the Water Control and Disposal Plan). The Waste Management Plan shall address all Construction and Demolition Waste, universal wastes, Hazardous Wastes, Excavation Soils, and any other solid debris intended to be removed from the project site(s).
  - a. Identify each type of material that will be generated during the project for disposal, recycling, salvage, or other management and estimate the volume/weight of each.
  - b. Identify how the Contractor will handle, transport, dispose of, or otherwise divert each type of material required to be removed under this contract in a safe, appropriate, and lawful manner in compliance with all applicable regulations of local, state, and federal agencies having jurisdiction over the removed materials.
  - c. Include a list of recycling facilities and processing facilities that will be receiving recyclable or recoverable materials, including, but not limited to concrete, asphalt, and metals.
  - d. Identify materials that are not recyclable or not recovered which will be disposed of in a landfill (or other means acceptable by the State of California and local ordinance and regulations). List the permitted landfill, or other permitted disposal facilities, which will be accepting the disposed waste materials. All landfills, hazardous waste, and universal waste disposal sites shall be approved for use by the Engineer. Refer to Appendix A for a list of approved facilities.
  - e. Describe planned sampling and analysis for characterizing wastes or the Sampling and Analysis Plan below in Paragraph 1.4.J.
2. The following additional waste management provisions shall be included in the Waste Management Plan to demonstrate compliance with or Contra Costa County requirements.
  - a. Include a good faith quantity estimate of each type of Construction and Demolition Waste that would be generated if no diversion methods were implemented. Submit estimate with calculations based on weight of each material. The following materials are subject to the estimate requirement:

- 1) Asphalt
  - 2) Concrete
  - 3) Aggregates
  - 4) Brick, masonry, clay products, and ceramic tile
  - 5) Excavation Soils
  - 6) Wood products, including clean dimensional wood, palette wood, plywood, OSB, and particleboard
  - 7) Metals, including banding, ductwork, flashing, piping, rebar, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass and bronze
  - 8) Plant and tree trimmings (may be included in wood products if accepted by recycling service)
  - 9) Cardboard, paper products, and packaging
  - 10)
  - 11) Mixed waste, including, but not necessarily limited to the following:
    - a) Beverage containers
    - b) Insulation
    - c) Roofing
    - d) Glass, excluding that used for containers
    - e) Gypsum board
    - f) Acoustical ceiling materials
    - g) Plastics, including ABS, PVC, and piping
    - h) Latex paint
    - i) Other materials
- b. Specify the haulers that will be used to transport or haul waste to landfills and disposal/reuse/recycling sites.
  - c. Include an example of a waste log or other tracking mechanism that will clearly show each load and its destination. The record shall clearly

distinguish between anything sent to landfill or recycling/reuse or salvage.

- 1) Include in log the type of load, load weight, name of hauling service, recycling service or landfill, and date accepted by recycling service or by landfill (or other service).
- d. Submit copies of any submittals to Contra Costa County required by their local ordinance. This includes permit applications, Waste Reduction and Recycling Plans, Construction and Demolition Summary Reports, or other similar documents. The permit application and Waste Reduction and Recycling Plan shall be submitted as an Appendix to the Waste Management Plan when possible.
3. For any proposed facility that is not on the District-approved disposal list, submit permission to reuse, recycle, reclaim, or dispose of material from the site owner along with any other information needed by the District to evaluate the acceptability of the proposed reuse, recycling, or disposal site and obtain acceptance of the Engineer prior to removing any material from the project site.
4. All information pertinent to the characterization of the material or waste shall be disclosed to the District and the reuse, recycling, reclamation, or disposal facility. Submit copies of any profile forms and/or correspondence between the Contractor and the reuse, recycling, reclamation, or disposal facility.

#### D. Imported Fill

1. If use of imported fill from the categories below is proposed, submit an Imported Fill Plan outlining the source of imported fill and the specific sites and locations where imported soil will be used.
  - a. Soil originating from sites with current or previous land use including industrial, manufacturing, maintenance, and waste storage sites
  - b. Soil originating from within 500 feet of a freeway
2. Virgin soil and fill from clean, undeveloped sites (e.g. quarry, soil pit) is not subject to the above requirements, however weighmaster tickets indicating source of material and weight shall be provided to the Engineer.
3. Proposed use of imported fill shall comply with the guidance and standards in the reference documents listed below
  - a. DTSC Clean Imported Fill Material Information Advisory (October 2001)
  - b. SF RWQCB Environmental Screening Levels, Version 2 (January 2019)

c. Alameda County Department of Environmental Health Soil Import/Export Characterization Requirements (August 2019)

1) These requirements apply to all District projects, including projects outside of Alameda County

4. Plan shall outline all of the required environmental and human risk-based screening levels that apply to the specific site where imported soil will be used and which compounds require sampling and analysis. Necessary sampling and analytical work shall be included in the Sampling and Analytical Plan submittal in Paragraph 1.4.J

5. A certificate of analysis for soil from a soil recycler or supplier may be substituted for sampling and analysis of imported fill in the project.

E. Spill Prevention and Response Plan

1. Submit plan detailing the means and methods for preventing and controlling the spilling of known hazardous substances used on the jobsite or staging areas.

a. Include a list of the hazardous substances proposed for use or generated by the Contractor on site, including petroleum products.

b. Define measures that will be taken to prevent spills, monitor hazardous substances, and provide immediate response to spills.

c. Include provisions for notification of the Engineer or alternate contact and appropriate agencies including phone numbers; spill-related worker, public health, and safety issues; spill control, and spill cleanup.

d. Map showing hazardous materials project-related storage locations, names of the hazardous materials, and volumes/quantities.

e. Submit a Safety Data Sheet (SDS) for each hazardous substance proposed to be used prior to delivery of the material to the jobsite.

F.

G. Waste Disposal Records

1. Copies of waste management and disposal records including bills of lading, manifests, weight tickets, and receipts from waste management facilities shall be submitted to the Engineer. This provision applies to Hazardous Wastes, universal wastes, treated wood wastes, solid wastes disposed at landfills, and radioactive wastes.

2. Hazardous Waste Manifests

- a. Use the “Uniform Hazardous Waste Manifest”, EPA form 8700-22. Contractor shall prepare and Engineer will review all hazardous waste manifests for acceptability prior to use.
- b. Submit the “Generator’s Initial Copy” and a legible photocopy of the first page of hazardous waste manifests, land disposal restriction forms, or other documentation required by applicable regulations governing transport and disposal of Hazardous Wastes for disposal of hazardous substances within 5 days of off haul.

#### H. Sampling and Analysis Plan

1. Submit a project-specific Sampling and Analysis Plan (SAP) for projects including but not limited to sanitary sewer discharge samples, waste characterization samples, air samples, and site characterization involving soil, groundwater, and soil gas samples requiring laboratory analysis. The SAP shall contain information noted below.
  - a. Project Description – Describe site history, data quality objectives (e.g. waste characterization), and any site background or other relevant information related to sampling.
  - b. Qualified Environmental Professional – Name the project manager(s) that will be in charge of overseeing sampling and analysis performed for this project and list their qualifications.
  - c. Sampling Objectives – Detail the location, number, type (e.g., grab or composite), material being sampled (e.g., soil, bead blast, groundwater, air, etc.), and the sampling methods and procedures to be used to obtain the samples. Include a site map showing sample locations when applicable.
  - d. Field Sampling Practices – Include the field practices to be used for sampling.
  - e. Analytical Laboratories and Methods – Include the name of the laboratory performing the analysis on the samples. Provide the Environmental Laboratory Accreditation Program (ELAP) certificate number of laboratory that will analyze samples for suspected hazardous substances.

PART 2 - NOT USED

PART 3 - EXECUTION

#### 3.1 IMPORTED FILL MATERIAL

- A. Submit a certificate of analysis and/or laboratory analytical reports for approval by the Engineer prior to use on a project. Use of imported fill will be evaluated using

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Environmental Requirements

guidance in the DTSC Clean Imported Fill Material advisory noted above as applied to the specific import fill and receiving site conditions.

1. Engineer may witness sampling and may take samples for District records and for additional analyses if required. Notify the Engineer at least 3 work days prior to sampling.

### 3.2 STORM WATER

- A. Follow all provisions in local storm water permits and/or rules during construction.
- B. Maintain sufficient best management practices or other controls as outlined in the storm water management plan to prevent impacts to storm water from pollution including soil, dust, stored hazardous materials, and construction activities.

### 3.3 WATER DISPOSAL

#### A. Sanitary Sewer Discharges

1. Conduct all required sampling specified in local discharge permits applicable to the sanitary sewer discharge.
2. Maintain sufficient controls (e.g., settling tanks for suspended solids) on sanitary sewer discharges to meet or exceed local discharge permit requirements
3. Submit all reports required in local discharge permits to the Engineer for review and approval prior to submitting them to an agency.

#### B. Non-Storm Water Discharges

1. Follow provisions in non-storm water discharge plan if discharging groundwater, wash water, or other non-storm water discharges.

### 3.4 WASTE MANAGEMENT & DISPOSAL

- A. Segregate, stage, label/mark, and properly manage waste at the jobsite in a manner that complies with applicable regulations and to facilitate proper disposal.
- B. Characterize all liquid wastes, solid wastes, and other wastes prior to removing from the project site. Sampling and analysis shall adhere to the Sampling and Analysis Plan.
- C. Engineer will review laboratory analysis results for District acceptance of Contractor Characterization of waste classification.
- D. Engineer will give Contractor written notice to dispose of all or a portion of the waste material at a Class I disposal site if the Engineer determines that such disposal

is required based on review of Contractors waste characterization and the analytical results of samples collected.

1. Additional payment for disposal (transport and dispose) at Class I site will be under Proposal Form.
- E. Non-hazardous waste shall be disposed as outlined in the approved Waste Management Plan.
- F. Waste materials from different sites shall not be transported or mixed until the material is determined to be non-hazardous. Unless pre-approved by the Engineer for direct hauling, excavation materials shall be stored or stockpiled at each site until classified and accepted for movement by the Engineer.
- G. Transport materials and/or wastes in accordance with all local, state, and federal laws, rules, and regulations.
- H. Contractor shall not assume any soil is approved for offsite reuse. Offsite reuse is only permitted with explicit approval from the Engineer after a careful review of the Contractor's proposed reuse.
- I. Contractor shall be responsible for all costs of disposal of Construction and Demolition Waste material and liquid wastes, along with any waste generated by the Contractor's work including Hazardous Waste generated from hazardous materials.

### 3.5 AIR QUALITY CONTROL

- A. Implement all necessary air pollutant construction measures per the Bay Area Air Quality Management District "Basic Construction Mitigation Measures" (BAAQMD CEQA Guidelines May 2017), including, but not limited to the following:
  1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
  2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
  3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
  4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
  5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
  7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
  8. The contractor shall post a District-furnished, publicly visible sign with District and Air District contact information regarding dust complaints.
  9. .
- B. Implement all necessary District air pollutant construction measures, including but not limited to the following:
1. Water and/or cover soil stockpiles daily.
  2. All transitions from soil to a paved road shall have best management practices applied to prevent drag out of soil.
  3. Water used for dust control shall not run off the job site and cause erosion or other issues.
  4. Use of recycled water for dust control is encouraged.
  5. Use line power instead of diesel generators at all construction sites where line power is available.
  6. Temporary sources of air emissions (such as portable pumps, compressors, generators, etc.) shall be electrically powered unless the use of such equipment is not practical, feasible, or available.
  7. All portable engines and equipment units used as part of construction shall be properly registered with the California Air Resources Board or otherwise permitted by the appropriate local air district, as required
  8. Minimize the use of diesel generators where possible.
  9. Follow applicable regulations for fuel, fuel additives, and emission standards for stationary, diesel-fueled engines.
  10. Locate generators at least 100 feet away from adjacent homes, schools, and parks.



11. Perform regular low-emission tune-ups on all construction equipment, particularly haul trucks and earthwork equipment.
12. On road and off-road vehicle tire pressures shall be maintained to manufacturer specifications. Tires shall be checked and re-inflated at regular intervals.

C. Dust Control during Abrasive Blasting:

1. Provide a containment system for the structure prior to beginning abrasive blasting operations. The system shall remain in place during the abrasive blasting operations and the painting of exterior surfaces.

3.6

3.7 NOISE CONTROL

- A. Comply with sound control and noise level rules, regulations, and local ordinances which apply to any work performed pursuant to the contract. Noise-generating activities shall be limited to the hours specified in Section 01 14 00.
- B. Take appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other measures as needed to bring construction noise into compliance.
- C. Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer.
- D. Use the best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) for all equipment and trucks, as necessary.
- E. Truck operations (haul trucks and concrete delivery trucks) shall be limited to the daytime hours specified in Section 01 14 00.
- F. Stationary noise sources (e.g., chippers, grinders, compressors) shall be located as far from sensitive receptors as possible. Enclosure opening or venting shall face away from sensitive receptors. Enclosures shall be designed by a registered engineer regularly involved in noise control analysis and design.
- G. If impact equipment (e.g., jack hammers, pavement breakers, rock drills etc.) is used during project construction, Contractor is responsible for taking appropriate measures, including but not limited to the following:
  1. Hydraulically or electric-powered equipment shall be used wherever feasible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used. External jackets on the tools themselves shall be used, where feasible. Quieter procedures, such as drilling rather than impact equipment, shall be used

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whenever feasible. It is the Contractor's responsibility to implement any measures necessary to meet applicable noise requirements.

2. Impact construction including jackhammers, hydraulic backhoe, concrete crushing/recycling activities, vibratory pile drivers etc. shall be limited to the daytime hours specified in Section 01 14 00.
3. Erect temporary noise barriers or noise control blankets around the construction site, particularly along areas adjacent to residential buildings.
4. Limit the noisiest phases of construction to 10 work days at a time, where feasible.
5. Notify neighbors/occupants within 300 feet of project construction at least thirty days in advance of extreme noise generating activities about the estimated duration of the activity.

#### H. NOT USED

### 3.8 CONTAMINATED SOILS AND GROUNDWATER SUSPECTED OR ENCOUNTERED DURING EXCAVATION

- A. If unexpected environmental contamination is discovered during excavation, the Contractor shall immediately stop work and notify the Engineer.
- B. Monitor for unexpected environmental contamination during excavation. This will be identified based on visual evidence or PID screening, and may include the following:
  1. Oily or shiny soils.
  2. Soils saturated with a liquid other than water (i.e., free-phase liquids).
  3. Soils with an appreciable chemical or hydrocarbon odor.
  4. Soils with elevated organic vapor measurements with a PID.
  5. Soil discoloration not related to lithologic changes.
  6. Color, odor, or sheen in groundwater.

### 3.9 SAMPLING AND ANALYSIS

- A. Sampling shall conform to the submitted Sampling and Analysis Plan and shall include all of the following:
  1. Appropriate methods for handling, preservation, and container selection
  2. A documented chain of custody with:

- a. An identifying sample number assigned for each sample
  - b. Name and organization of each person having custody of the sample
  - c. Job name and location
  - d. Time of day and date sample taken
  - e. Material sampled
  - f. Tests to be performed
3. For projects involving acquisition or sampling conducted under regulatory oversight, Quality Assurance & Quality Control (QA/QC) samples shall be collected and analyzed.
- B. Analytical methods shall be appropriate and approved for the purpose of the sampling.
1. Analysis of wastes shall be conducted according to methods listed in Environmental Protection Agency Document SW 846.
  2. Analysis of wastewaters and sanitary sewer discharges shall comply with methods outlined in 40 CFR 136.
- C. Submit laboratory analysis results that include:
1. Sampling and analytical methods
  2. Sample locations
  3. Completed Chain of Custody
  4. QA/QC reports received from the laboratory
  5. Drawings, maps, photographs, or other descriptions that clearly identify what location or material is represented by the sample

END OF SECTION

## SECTION 01 35 53

### SECURITY PROCEDURES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Requirements of this section apply to work sites located at or near critical District facilities or infrastructure. This project involves:
  - 1. On-line water treatment facility that will remain in operation during the construction of this project
- B. Contractor shall comply with the District's protocol as described herein for personnel identification, site access control, and contractor deliveries.
- C. Unless otherwise specified in the Contract Documents, Security of this (these) site(s) and the Contractor's equipment and tools shall be the Contractor's responsibility from commencement of work through contract completion.
- D. Contractor's site security monitor shall be on-site and available at all times while work is being performed ensuring that requirements of this section are met. This individual may be the superintendent.
- E. The District reserves the right to deny access to the site to any person as allowed by law.
- F. Related Sections:
  - 1. Section 01 11 00 – Summary of Work
  - 2. Section 01 14 00 – Work Restrictions
  - 3. Section 01 35 24 – Project Safety Requirements
  - 4. Section 01 50 00 – Temporary Facilities and Controls

##### 1.2 SUBMITTALS

- A. Provide daily sign-in log to the Engineer identifying all personnel on the job for that workday. Logs shall be provided to the Engineer at the end of each workday. Log shall include: individuals' full name, company and company phone number.
- B. Provide a legible photo copy of the personnel's current California Driver's License, California Identification Card (issued by the California Department of Motor Vehicles), or other current government issued driver's license or photo identification for all personnel working on site whether or not they have been issued a District photo identification badge. Provide these copies no later than the first day the personnel report to the work site. These copies shall be retained by the Engineer

for the duration of the project and will be returned to the contractor or shredded, at Contractor's discretion, once the project is completed and all materials between District and Contractor are closed out.

- C. Submit to the Engineer the key control plan per Article 1.5.B.
- D. Submit individual District photo identification badge application forms for all personnel who will work at the site and require badges per Article 1.3.B. Along with each application form, provide the Engineer with the following:
  - 1. A copy of the individual's current California Driver License, California DMV Issued ID card, or the equivalent from another governmental entity. Contractor shall verify that each employee provides valid proof of his/her identity and that those employees who drive are properly licensed.
- E. Submit name of individual(s) designated as the site security monitor(s), and that individual's cell phone contact number.
- F. Submit to the Engineer acknowledgement of Contractor Deliveries requirements prior to allowing deliveries to the site.
- G. Submit executed Photo Confidentiality Agreement prior to project mobilization.

### 1.3 PERSONNEL IDENTIFICATION AND BADGING

- A. Contractor's personnel and all people associated with the work will be issued individual District Photo Identification (ID) Badges that will be valid for the duration of the project.
- B. Contractor shall complete a Non-Employee Access Card Request (Form K-073A, see Appendix A) for each of Contractor's personnel and all people associated with the work. Provide the Engineer with a list of contractor's personnel and all people associated with the work and completed K-073A form for each individual. The Engineer will forward that list and the completed K-073A forms to the District's Security Administration. After the Engineer notifies the Contractor that the list and request forms have been sent to Security Administration, Contractor shall contact the District's Security Administration at 510/287-0892 to arrange the date and time for those listed people to take personnel photographs at the District's Security Office at the main Administration Building in Oakland, or arrange for remote badging. Proof of Identification, such as a current California driver's license or other current government photo identification must be provided for each individual at the time they come to the District to have their photo taken for issuance of a Photo ID Badge. For remote badging, the Contractor shall provide a photo and identifying information for each contract employee to the District Sponsor for the project. The District Sponsor will submit the completed Form K-073A for each contract employee to Security Administration. The badge will be created remotely and then routed to the District Sponsor for distribution. The Contractor shall repeat the badging procedure on an as-needed basis when additional Photo ID Badges are required for contractor's staff during the course of the project.

C. Record Keeping

1. Contractor shall keep a written record of the name, employer, work telephone number and a copy of the current driver's license or current State issued identification card of each person issued a Photo ID Badge.
  2. Lost or missing badges shall be reported immediately to the Engineer and to the District's Security Administration so the lost card can be de-activated in the security system. Upon request, the District may issue a replacement card at expense of the Contractor.
  3. A cumulative list of lost or missing Photo ID Badges shall be kept by the Contractor and submitted to the Engineer with monthly progress documentation, or upon the request of the Engineer.
  4. All project-specific Photo ID Badges shall be surrendered to the District no later than at the completion of the contract.
  5. The Contractor shall immediately surrender to the District the badges of any Contractor's employee that is reassigned to other sites or terminated during the construction. The Contractor shall be responsible for collecting and returning the badges to the District when a contractor's staff leaves the company or is no longer assigned on that project; and all Photo ID Badges must be returned to the Engineer (who will return them to Security Administration) when the project is complete, with no exceptions.
- D. All personnel associated with the work shall be required to wear District-issued Photo ID Badge at all times while working at the site. Photo ID Badges shall be attached above the waist on outer garments or affixed to a hard hat and shall be visible at all times. Any Contractor employee or worker who does not display a Photo ID Badge while on site shall be required to leave the site or will be denied access until such time as they have an approved badge.
- E. Upon request, badges shall be shown to District's staff or security officers. Persons without badges shall be required to immediately leave the site unless the Contractor's site security monitor can verify that the person is required on site.
- F. Emergency (unplanned) site access – For emergency access as determined by the Contractor and approved by the Engineer, the Contractor's site security monitor shall verify the identity of the person entering without a Photo ID Badge. That person will be deemed to be a visitor and must be escorted at all times while on the site, by a District employee or a Contractor employee that does have a Photo ID Badge and is to be held responsible for that visitor. A legible photo copy of the visitors current California Driver's License, California Identification Card (issued by the California Department of Motor Vehicles), or current driver's license or photo identification card from another governmental entity must be made on the site by the Contractor or the Engineer, and attached to the daily log of site personnel for that day.

- G. The Contractor will be assessed a \$250 fee for each unreturned Photo ID Badge or each replacement badge, which will be withheld from final payment.
- H. Contractor and all other people associated with the work that enter the site are required to possess and carry a valid and current California Driver's License, California Identification Card (issued by the California Department of Motor Vehicles), or current driver's license or photo identification card from another governmental entity. This identification shall include a photograph and signature of the holder. Personnel without such identification shall be removed from the site by the Contractor.

#### 1.4 BACKGROUND CHECKS

- A. Upon request and at no additional cost to the District, the Contractor shall provide such information as necessary and as allowed by law to complete a background check on any person that enters the site.
- B. The District reserves the right to deny access to the site to any person as allowed by law.

#### 1.5 SITE ACCESS CONTROL

- A. At the end of each workday, any gates, hatches, doors, windows, manways, and exterior ladders, etc. shall be secured, closed, and locked. Any alarmed system which is activated or disabled during the workday shall be tested through to the alarm monitoring station for proper actuation.
- B. At the end of each workday secure all equipment, hazardous materials, tools, materials, and flammable fluids. The Contractor shall maintain key control to assure only authorized personnel have access to equipment, hazardous materials, tools, materials, and flammable fluids. Prepare a key control plan outlining the lock system to be used along with the list of personnel who will be issued keys and are authorized to use said keys. Upon loss of critical keys, the Contractor shall replace all corresponding locks and re-issue keys to prevent unauthorized access.
- C. Unless otherwise indicated on the Drawings, existing fences and gates at the site shall remain intact and in use throughout construction. The existing perimeter security of the site shall be maintained at all times. Fences and gates that are breached due to construction (e.g., construction of a utility crossing under a fence), shall be restored by the end of work hours each day. The District reserves the right to request additional fencing around any areas of the construction site. Additional fencing will be paid as extra work.
- D. Contractor-requested modifications to existing fences and gates are subject to Engineer's approval.
- E. The main Administration Building/Adeline Maintenance Facility has established security checkpoints.

- F. At the Sobrante Water Treatment Plant(s), the District operates an existing security checkpoint officer at the plants' main entry gate. The security checkpoint will be staffed by a District security officer during all regular work hours and other hours as may be determined by the District. As determined by the District, roving security officer(s) may also patrol the treatment plant property.
- G. Facility perimeter gates are normally opened only for emergency or infrequent vehicle ingress/egress. Perimeter gates are to be kept closed at all other times.
- H. The District reserves the right to establish a Security Check-in/Out location for any job site.
- I. The District reserves the right to assign a District's security officer to provide security for any job site.
- J. The Contractor is advised that all persons seeking entry to the site will be required to show proof of identification (e.g. driver's license). All Contractor's trucks and drivers are subject to the same identification and search requirements.
- K. At all times, security measures at the site shall, at a minimum, be equal to the security measures prior to initiation of the project as determined by the Engineer.

#### 1.6 DAILY SITE ACCESS PATH

##### A. General:

- 1. All personnel shall take the most direct path from their point of site entry to their work area and shall not loiter in non-work areas.

##### B. At the Sobrante Water Treatment Plant

- 1. All personnel shall enter the site through the main gate on Amend Road and proceed directly to the work area.
- 2. Contractor's personnel shall use contractor-provided restroom facilities.

#### 1.7 PHOTO CONTROL

- A. Complete the Photo Confidentiality Agreement in Appendix A.
- B. Restrict photos to work zone.
- C. Photos, negatives, and other images of the project shall be destroyed at project completion when all claims are resolved.
- D. The District reserves the right, at any time, to disallow photography at any site, of any District facilities, equipment, or processes which are deemed to be sensitive in nature, either due to current threat-level conditions or internal assessment of the business need and benefit to the District.



## 1.8 CONTRACTOR DELIVERIES – SECURE SITE

- A. United States Postal Service, Federal Express, UPS, or similar mail and parcel deliveries may be addressed to the Contractor or any subcontractor or supplier to the Sobrante Water Treatment Plant at 5500 Amend Road, El Sobrante, CA 94803 or other offsite point established by Contractor.
- B. All deliveries shall be made during normal work hours as defined in Section 01 14 00 Work Restrictions.
- C. Follow the guidelines in Publication 166, US Postal Inspection Service Guide to Mail Center Security. A copy of these guidelines can be found at: <https://about.usps.com/publications/pub166.pdf>
- D. Mail and Packages:
  - 1. Contractor shall either:
    - a. Set up off-site package processing center with a separate address and then bring deliveries to the site with its own vehicles, or
    - b. Take delivery in a separate processing “shed” on site but separated from main facility areas at a location approved by the Engineer. This site can be the Contractor’s separate temporary office facility outside of the main treatment plant gate.
  - 2. All mail and packages whether delivered to the Contractor’s onsite or offsite facility shall not be allowed into the Sobrante Water Treatment Plant until such time as they have been screened by Contractor’s personnel in accordance with the US Postal Inspection Service Publication 166 mail and package screening guidelines, or with the Contractor’s submitted mail screening procedures.
- E. Freight and bulk deliveries:
  - 1. All deliveries will be stopped at the security gate.
  - 2. District’s security officer will notify Contractor’s site security monitor.
  - 3. Truck drivers will be subject to the identification requirements as specified in Article 1.3 of this section.
  - 4. Deliveries of freight and bulk (larger packages, crates, equipment, or materials) are permitted to enter the site only after:
    - a. The vehicle is met at Sobrante Water Treatment Plant by Contractor’s site security monitor,
    - b. The source and contents of the packages, crates, equipment, or materials are verified by the Contractor’s site security monitor,

- c. The driver and others provide the security officer with sign-in information and badge(s) are issued to the driver (and others as required).
- F. All freight and bulk deliveries made to the site may be subject to search and inspection regardless of the final delivery destination. The Contractor shall inform all delivery companies and drivers in advance that all freight entering the site is subject to search. Contractor shall submit acknowledgment from all freight and bulk delivery companies that the companies have been informed of and consent to such searches.
- G. .

#### 1.9 PRODUCTIVITY LOST AND COST INCURRED DUE TO SECURITY REQUIREMENTS

- A. Time lost and/ or costs incurred due to compliance with District security measures (e.g., deliveries or personnel held at the gate without badges or identification, refusal of package deliveries, etc.) shall be deemed an inexcusable delay.
- B. Failure to comply with these security measures may lead to the termination of the Contractor's right to proceed under the contract, in accordance with 11.1.2 of the General Conditions and may lead to termination of the contract, in accordance with 11.1.3 of the General Conditions.

#### 1.10 PAYMENT

- A. Full compensation for doing all work and furnishing all materials required to comply with site security requirements as specified in these Specifications shall be included in the price bid for the contract.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

## SECTION 01 42 19

### REFERENCE STANDARDS

#### 1.1 GENERAL

##### A. Referenced Standards and Design Codes:

The standards referred to, except as modified, shall have full force and effect as though printed in this Specification, and shall be the latest edition or revision thereof in effect on the bid opening date, unless a particular edition or issue is indicated. Copies of these standards are not available from the District. The Engineer will furnish, upon request, information as to how copies may be obtained. Abbreviations and terms, or pronouns in place of them, shall be interpreted as follows:

AAMA:	Architectural Aluminum Manufacturer's Association
AAR:	Association of American Railroads
AASHTO:	American Association of State Highway and Transportation Officials, Standard Specifications
AATCC:	American Association of Textile Chemists and Colorists
ABMA:	American Bearing Manufacturers Association, Inc.
ACI:	American Concrete Institute International, Standards
AGA:	American Gas Association
AGC:	Associated General Contractors of America
AGMA:	American Gear Manufacturers Association
AHAM:	Association of Home Appliance Manufacturers
AHIA	American Horticulture Industry Association
AI:	The Asphalt Institute
AIA:	The American Institute of Architects
AISC	American Institute of Steel Construction
AISI:	American Iron and Steel Institute

AITC:	American Institute of Timber Construction
AMCA:	Air Moving and Control Association International, Inc.
AMPP	Association for Materials Protection and Performance
ANS:	American Nuclear Society
ANSI:	American National Standards Institute
APA:	The Engineered Wood Association
API:	American Petroleum Institute
APWA:	American Public Works Association
ASA:	Acoustical Society of America
ASABE:	American Society of Agricultural and Biological Engineers
ASCE:	American Society of Civil Engineers
ASHRAE:	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME:	American Society of Mechanical Engineers
ASQ:	American Society of Quality
ASSE:	American Society of Sanitary Engineering
ASTM:	ASTM International
AWG:	American Wire Gauge
AWPA:	American Wood Protection Association
AWS:	American Welding Society
AWWA:	American Water Works Association
BHMA:	Builders Hardware Manufacturer's Association
CAL/OSHA:	California/Occupational Safety and Health Administration
CBC:	California Building Code
CCR:	California Code of Regulations
CEMA:	Conveyors Equipment Manufacturers Association

CGA:	Compressed Gas Association
CISPI:	Cast Iron Soil Pipe Institute
CLFMI:	Chain Link Fence Manufacturers Institute
CMAA:	Crane Manufacturers Association of America
CMC:	California Mechanical Code
CPC:	California Plumbing Code
CRSI:	Concrete Reinforcing Steel Institute
CSS:	CalTrans Standard Specifications, State of California, Department of Transportation
DOSH:	Division of Occupational Safety and Health, State of California, Department of Industrial Relations
EIA:	Electronic Industries Alliance
ETL:	ETL Testing Laboratory
FED/OSHA:	Federal Occupational Safety and Health Administration, Standards
IBC:	International Building Code
ICC:	International Code Council
ICEA:	Insulated Cable Engineers Association
IEEE:	Institute of Electrical and Electronic Engineers
IES:	Illuminating Engineering Society
IME:	Institute of Makers of Explosives
IP:	Institute of Petroleum (London)
IPC:	Institute of Printed Circuits
IPCEA:	Insulated Power Cable Engineers Association
ISA:	International Society of Automation
ISO:	International Organization for Standardization

ITE:	Institute of Transportation Engineers
MBMA:	Metal Building Manufacturers Association
MPTA:	Mechanical Power Transmission Association
MSS:	Manufacturers Standardization Society
MTI:	Marine Testing Institute
NAAM:	National Association of Architectural Metal Manufacturers
NACE:	National Association of Corrosion Engineers
NIST:	National Institute of Standards and Technology
NCCLS:	National Committee for Clinical Laboratory Standards
NCMA	National Concrete Masonry Association
NEC:	National Electric Code
NEMA:	National Electrical Manufacturers Association
NFPA:	National Fire Protection Association
NFPA 5000:	Building Construction and Safety Code
NGLI:	National Lubricating Grease Institute
NMA:	National Microfilm Association
NWMA:	National Woodwork Manufacturers Association
OSHA:	Occupational Safety and Health Administration
PCA:	Portland Cement Association
RIS:	Redwood Inspection Service, Standard Specifications
RVIA:	Recreational Vehicle Industry Association
RWMA:	Resistance Welder Manufacturer's Association
SAE:	Society of Automotive Engineers
SAMA:	Scientific Apparatus Makers Association
SDI:	Steel Door Institute

SIS:	Swedish Standards Association
SMA:	Screen Manufacturer's Association
SMACNA:	Sheet Metal and Air Conditioning Contractors National Association
SPR:	Simplified Practice Recommendation
SSBC:	Southern Standard Building Code, Southern Building Code Congress
SSPC:	Society for Protective Coatings
SSPWC:	Standard Specifications for Public Works Construction
STLE	Society of Tribologists & Lubrication Engineers
TAPPI:	Technical Association of the Pulp and Paper Industry
TFI:	The Fertilizer Institute
UPC:	Uniform Plumbing Code
UL:	Underwriters Laboratories
WCLIB:	West Coast Lumber Inspection Bureau
WIC:	Woodwork Institute of California
WRI:	Wire Reinforcement Institute
WWPA	Western Wood Products Association

END OF SECTION

## SECTION 01 50 00

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: Provide temporary construction facilities, utilities, and controls needed for the work.
- B. Furnished by the District:
  - 1. Water: The District will furnish water for hydrostatic testing of the completed facility. Water for initial testing and disinfecting will be furnished without charge. See Section 01 14 00 Work Restrictions.
  - 2. Electric Power: The District will furnish 120 volt, 200A AC electric power at locations shown on drawings. The supply of power will be subject to District operational requirements and may not be available during electrical system shutdowns.
- C. Related Sections
  - 1. Section 01 14 00 – Work Restrictions.
  - 2. Section 01 35 44 – Environmental Requirements
  - 3. Section 01 35 53 – Security Procedures
- D. Water – Recycled
  - 1. Recycled water may be available. Visit the following websites for information on recycled water truck programs and conditions of use for recycled water.
    - a. <http://www.ebmud.com/water-and-drought/recycled-water/recycled-water-truck-program>
    - b. <http://www.dsrsd.com/do-business-with-us/recycled-water-use/recycled-water-construction-meters-hydrants-and-commercial-fill-station>
    - c. <https://www.centalsan.org/pod/recycled-water-truck-fill-program>

##### 1.2 SUBMITTALS

- A. Submit a written plan, approved by the agency having jurisdiction, for the storage of pipe and construction materials, and for the parking of construction equipment on any public road, street, or right-of-way, prior to any field work.



- B. Submit written evidence, acceptable to the Engineer, that restoration of the construction site and repair of facilities damaged by the Contractor have been accepted by each agency having jurisdiction.
- C. Submit a written plan detailing the location of the temporary field office/trailer for the Engineer with a list of materials and equipment to be provided.

## PART 2 - NOT USED

## PART 3 - EXECUTION

### 3.1 TEMPORARY UTILITIES

- A. Contractor shall provide and pay for all necessary temporary high-speed internet, telephones, power, and sanitary accommodations. Utilities shall be available prior to the start of work at the project site(s).
- B. Provide two sanitary units at the Engineer's field trailer. Sanitary units shall be serviced twice a week, or more frequently if directed by the Engineer.
- C. The temporary facilities to be provided by the Contractor as described above shall conform to all requirements in regard to operation, safety, and fire hazards of State and local authorities and of Underwriters.
- D.

### 3.2 WATER

- A. Provide all construction water except that provided by the District for hydrostatic testing.
- B. Provide all potable water required for drinking or other purposes for Contractor and District staff.
- C. Provide and maintain all necessary equipment and facilities for conveying water, including water for testing and disinfection, to places where it will be used and for increasing the pressure if required.
  - 1. Backflow prevention devices
    - a. All temporary connection to active potable water mains and/or fire hydrants shall include an approved reduced pressure principle backflow prevention device.
    - b. All backflow prevention devices shall be tested by an approved certified backflow tester every six months. A certification tag shall be attached to the device at all times. Backflow prevention device test results shall be submitted to the District prior to using the device.

- c. Temporary piping and backflow prevention device assemblies shall be approved by the Engineer prior to making connection.
  - d. The supplemental attachment following the end of this section contains a list of approved reduced pressure principle backflow prevention devices and certified backflow testers.
- D. Plan and perform work in a manner which will avoid waste of water.
- E. Plan and provide for collection and testing of wastewater prior to discharge. See Section 01 35 44 – Environmental Requirements.

### 3.3 TRASH CONTROL

- A. All food waste shall be placed in closed containers and disposed of daily at an authorized disposal site, as necessary, to avoid attracting animals. The Work Area and other construction areas shall be checked daily by Contractor, and any garbage shall be collected and removed by the end of each day.
- B. Keep the Work Area and other areas used in a neat and clean condition, and free from any accumulation of rubbish. Dispose of all rubbish and waste materials of any nature occurring at the construction site, and establish regular intervals (end of each week at a minimum) for collection and disposal of such materials and waste. Keep haul roads free from rubbish, and unnecessary obstructions. Disposal of all rubbish and surplus materials shall be off the construction site in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

### 3.4 DUST AND LITTERING

- A. Provide and maintain dust control to prevent operations from causing dust damage or nuisance to property or persons.
- B. All trucks shall be loaded in a manner which will prevent dropping of materials or debris on streets. The loads shall be trimmed and all material shall be removed from shelf areas of vehicles to prevent spillage. Take precautions when necessary to avoid creating dust and littering by watering the load after trimming and by promptly sweeping the pavement to remove dirt and dust.
- C. See also Section 01 35 44 – Environmental Requirements.

### 3.5 CONSTRUCTION CLEANING

- A. Maintain the site and all stored items in a neat and orderly condition allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.

- B. Sweep the street in the work area with a wet power vacuum street sweeper on a daily basis. The sweeper shall be equipped with a dust suppression system and capable of collecting rock, gravel, sand and dust.
- C. Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final cleaning to enable the District to accept a completely clean project. See also Section 01 74 05 – Cleaning.

### 3.6 SAFETY

- A. Provide and maintain such fences, barricades, signs, and warning lights as may be required to provide safety against accidents and to comply with all permit requirements. See also Section 01 35 24 – Project Safety Requirements.

### 3.7 ACCESS CONTROLS

#### A. Public Access

1. Convenient access to driveways, buildings, and trails in the vicinity of work shall be maintained at all times. Temporary approaches to, and crossing of, intersecting traffic lanes shall be provided and kept in good condition.
2. When leaving a work area and entering a roadway carrying public traffic, the Contractor's equipment, whether empty or loaded, shall in all cases yield to public traffic.

#### B. Private Property

1. Conditions on Right-of-Way Agreements for private properties shall be adhered to by Contractor.
2. Contractor shall make provisions, as necessary, to protect private property including livestock, from damage due to construction including putting up and maintaining temporary fencing around the construction limit.

### 3.8 PETS, CAMPING, FIREARMS, AND USE OF AREA

- A. No camping shall be allowed on the Work area or at any construction site. Only authorized off-site, established camping areas may be used by construction personnel.
- B. No pets shall be allowed on the Work area, staging areas, access roads, or any other construction sites.
- C. Possession of firearms shall be prohibited in the Work area or any construction site. This includes firearms displayed in gun racks, contained in vehicles, or any other container or storage feature. See Section 01 35 53 Security Procedures.

- D. Construction workers and other Contractor personnel, equipment, materials, spoil, and all activities shall stay within the designated Work area or facility site during Work activities. Exceptions that will not cause environmental impacts may be granted only after permission is obtained from the property Owner and approved by the Engineer.

### 3.9 RESTORATION

- A. Site and facilities shall be returned to their original "as-found" condition or as otherwise specified, at the completion of the project.
- B. A final inspection and acceptance by the agency having jurisdiction will be required prior to acceptance by the Engineer.

### 3.10 SUPPLEMENTS

- A. The following supplements follow END OF SECTION and are a part of this section:
  - 1. Approved Backflow Prevention Devices, Reduced Pressure Principle Devices
  - 2. Certified Backflow Testers List

END OF SECTION

## SECTION 01 74 05

### CLEANING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Section includes: Perform the work necessary for cleaning during construction and final cleaning on completion of the work.
- B. Cleaning for specific products or work is specified in the individual specification sections.

#### PART 2 - NOT USED

#### PART 3 - EXECUTION

##### 3.1 GENERAL

- A. At all times maintain areas covered by the Contract and public properties free from accumulations of waste, debris, and rubbish caused by construction operations.
- B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws. Do not burn or bury rubbish and waste materials on project site. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Do not dispose of wastes into streams or waterways.
- C. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- D. Use cleaning materials only on surfaces recommended by cleaning material manufacturers.

##### 3.2 CLEANING DURING CONSTRUCTION

- A. During execution of work, clean site and public properties and legally dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish. All soil and any other material tracked onto the streets by the Contractor shall be cleaned immediately. The Contractor shall comply with all rules and regulations as applicable for its cleaning method.
- B. Dispose of all refuse off District property as often as necessary so that at no time shall there be any unsightly or unsafe accumulation of rubbish.
  - 1. Pine needles, leaves, sticks, and other vegetative debris on the ground shall be removed if they are in the way of construction, present a safety hazard, or present a fire hazard. Otherwise they shall be left in place during construction and final cleaning

- C. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- D. Provide approved containers for collection and disposal of waste materials, debris, and rubbish.
- E. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from exposed and semi-exposed surfaces.
- F. Repair, patch, and touch up marred surfaces to specified finish to match adjacent surfaces.
- G. Vacuum clean all interior spaces, including inside cabinets. Broom clean paved surfaces; rake clean other surfaces of grounds.
- H. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- I. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- J. Vacuum clean interior of shop building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until successful completion of the Startup Test as defined in Section 01 75 17 – Field Startup and Testing.

### 3.3 FINAL CLEANING

- A. At the completion of work on all portions of the contract and immediately prior to final inspection, cleaning of the entire project will be accomplished according to the following provisions:
  - 1. Thoroughly clean, sweep, wash, and polish all work and equipment, including finishes. The cleaning shall leave the structures and site in a complete and finished condition to the satisfaction of the Engineer.
  - 2. Should the Contractor not remove rubbish or debris or not clean buildings and site as specified above, the District reserves the right to have the cleaning done at the expense of the Contractor.
- B. Employ professional cleaners for final cleaning.
- C. In preparation for contract completion, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.
- D. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
- E. Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces.

- F. Broom clean paved surfaces; rake clean other surfaces of grounds.
- G. Replace air-handling filters if units were operated during construction.
- H. Clean ducts, blowers, and coils, if air-handling units were operated without filters during construction.
- I. Clean luminaires in accordance with manufacturer's recommendations and relamp. Clean all light fixtures.
- J. Clean debris from roofs, gutters, and downspouts.
- K. Remove from District property all temporary structures and all material, equipment, and appurtenances not required as a part of, or appurtenant to, the completed work.
- L. Leave watercourses, storm drains, inlets, and ditches open and clear.

END OF SECTION

## SECTION 01 75 17

### FIELD TESTING AND STARTUP

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: Perform field testing, and startup of installed equipment and systems, as well as other manufacturer services.
- B. All field testing shall comply with the requirements of this section. Additional field testing requirements are specified in other sections.
- C. For factory testing and other testing requirements, see technical sections.
- D. District Furnished Services: The District will furnish non-potable water required for testing unless otherwise specified.
- E. All equipment and systems testing and startup activities shall be allowed for and shown on the Contractor's Construction Progress Schedule, in accordance with Section 01 32 00 – Construction Progress Documentation.

##### 1.2 DEFINITIONS

- A. Commissioning: The process of testing the installation for compliance with contract requirements and demonstrating, through documented verification, that the project has successfully met the contractual requirements and the Project is ready for Operational Start-up.
- B. Factory Acceptance Testing (FAT): Quality control testing conducted at the Manufacturer's facility to demonstrate components, devices, equipment/systems, and software meets specified performance requirements prior to shipment. Also referred to as source testing
- C. Control Systems Functional Test (CSFT): testing to demonstrate the proper interaction of the facility control systems and related equipment. This primarily includes the electrical power control and monitoring system and pumping plant PLC- and SCADA RTU-based instrumentation and process control system, as well as all related equipment. Unlike other field tests, the District conducts this testing with the Contractor's assistance. The system integrator (specified in \_\_\_\_\_) shall support District staff during Control System Functional Testing.
- D. Functional Test: The field testing required to determine if installed equipment or system will operate in a satisfactory manner and as specified. The Functional Test is a point-by-point test to confirm that all components associated with the equipment or system is operating properly. Functional testing is not intended to measure efficiency and performance.



- E. Manufacturer's Certificate of Proper Installation: The form is submitted to the Engineer prior to Functional Testing to confirm that the equipment/system is installed in conformance with the Contract Documents. The form is provided in Appendix A.
- F. Operational Startup Test: A test of all systems operating together to demonstrate satisfactory performance of the facility as a whole for a continuous period.
- G. Performance Test: The field testing required to demonstrate the individual equipment or system meets all of the specified performance requirements.
- H. Startup: The process of performing startup testing of the facility.
- I. Test Procedures: Test procedures shall include testing methods, acceptance criteria, procedures, and test data forms for functional and performance tests.

### 1.3 FIELD TESTING INSTRUMENTS

- A. The Contractor or its qualified subcontractors/vendors shall provide all instruments and materials necessary to complete the field tests unless otherwise specified. If required calibration instruments and materials are not provided on the day of test, the Engineer may postpone witnessing and sign off of instrument testing.
- B. All instruments shall be calibrated prior to the start of testing. Certificates of calibration for all instruments used for testing shall be current, and shall be at the job site during testing. If an uncalibrated instrument was used in a test, the entire test shall be redone with calibrated instruments at the Contractor's sole expense including labor costs and other expenses incurred by District staff to witness the retest.

### 1.4 QUALITY ASSURANCE

- A. All tests shall be subject to approval of the Engineer, and shall be witnessed by the District. No testing shall be scheduled by the Contractor without Engineer approved test submittals. The Contractor shall provide a minimum of 5 work days' written notice confirming testing dates to the Engineer to enable witnessing of the testing. Notification shall be provided via the three week look-ahead schedule as described in Section 01 31 19 – Project Meetings.

### 1.5 SUBMITTALS

- A. Submit the following within 90 days of NTP
  - 1. Comprehensive Testing Schedule
- B. Submit the following at least 60 calendar days prior to factory and field testing:
  - 1. Test procedures for all field tests

2. Manufacturer's representative's resume demonstrating their qualifications and ability to perform the specified services
- C. Prior to field testing, submit Calibration certificates for all instruments to be used during testing.
- D. Test Reports:
  1. Test Reports shall be submitted for complete systems; which is typically by specification section. Submitting partial test reports is not acceptable. Test submittals shall include the Specification Section number and Equipment Name in the title.
  2. Upon completion of testing for each equipment item or system, the Contractor shall submit typewritten or word processed test reports and forms for review and acceptance within 10 calendar days of completed testing. Submit test results with signed statement by manufacturer's representative that results meet specification requirements and manufacturer standards; when a manufacturer's representative is not required to be present during testing, this signed statement shall be provided by the Contractor. Upon acceptance, all test reports (including all factory and field testing) shall be inserted by the Contractor into their respective O&M manuals.

#### 1.6 MANUFACTURERS' SERVICES

- A. A manufacturer's authorized representative shall perform all services when manufacturer's services are specified in the technical sections. The authorized representative shall be factory trained and experienced in the technical applications, installation, operation, and maintenance of the equipment, subsystem, or system. Additional qualifications may be specified elsewhere.
- B. Manufacturer's representatives shall be subject to acceptance by the Engineer. No substitute representatives will be allowed without prior written approval by the Engineer.

#### 1.7 TEST AND STARTUP SCHEDULE

- A. Updated test schedules shall be submitted on a monthly basis after the first test schedule submittal.
- B. List all equipment testing by specification section number and name. Include the following for each equipment/system:
  1. Specification section and paragraph number
  2. Testing pre-requisites as specified in technical specification sections
  3. Test type (functional, performance, startup)

4. Test procedure submittal date
  5. Testing and startup dates
  6. Test report submittal date
- C. Estimate dates as necessary, include actual dates when known

## 1.8 TEST PROCEDURES

- A. The manufacturer's representative shall compose test procedures and Field Functional Test Data Forms for each required Functional and Performance test and for all equipment specified in the individual equipment specifications.
- B. Unless otherwise noted, submit individual Field Test Procedures and Field Functional Test Data forms by specification section. Grouping test procedures for multiple specification sections into a single submittal is not acceptable. If functional tests are submitted together with performance tests, then separate each procedure and clearly identify each test by name: Functional Test, or Performance Test.
- C. Coordinate with the Engineer to determine the operating requirements of adjacent or related systems that may be required to complete the Startup Test.
- D. Prior to submitting for Engineer review, the Contractor shall review all test procedures to verify completeness and compliance with the specifications.
- E. All test procedures shall be comprehensive, neatly organized, and word-processed. Test procedures shall include the following:
  1. Detailed test methods including sample calculations as required.
  2. Test setup procedures including details of all necessary adjustments, balancing, required equipment isolations or configurations, testing equipment, and testing instruments.
  3. Step-by-step testing procedures (number each step). Specifically identify each test instrument (including tag numbers) used during testing.
  4. Acceptance Criteria: For each test phase, specifically indicate what is considered an acceptable test result.
  5. Data Forms: Include test name, equipment (with tag numbers as applicable) or system name, specification section and paragraph number, test instrument tag numbers, test date, space for testing personnel names, test data names and units, reference equations for all calculated values, and signature lines for manufacturer's representative, Contractor, and District witness.
  6. Field Functional Test Data Form: A template for a field functional test data form is included in Appendix A. The Contractor may use this template as a

starting point when developing specific field functional test data forms, or the Contractor may develop their own data form provided that the data forms include all required information as specified in the template. A Microsoft Word electronic version of the field functional test data form template will be made available upon request.

7. Test Procedures: Testing procedures and manufacturer representative's resumes shall be approved by the Engineer prior to performing any tests.

## 1.9 FUNCTIONAL TESTS

- A. Functional tests shall not proceed until the Engineer has received, reviewed and approved the items listed below. The Contractor shall ensure that copies of these materials are on-site during testing.
  1. Interconnection diagrams
  2. As-builts
  3. Manufacturer's Certificate of Proper Installation (when required)
  4. Approved equipment or system technical submittal
  5. Approved draft O&M Manuals with all factory test results and certificates excluding field functional testing and as-builts
  6. All factory test reports
  7. Calibration certificates (for all instruments used during testing)
  8. All piping, conduit, equipment and systems have been properly tagged and labeled
  9. Functional Test Procedures and Field Functional Test Data Forms
- B. Field Commissioning of Instruments:
  1. All instruments, including those provided by the District, which will be used as part of a functional test shall be properly commissioned prior to the start of the test (see Section 33 09 11 – Instruments and Recorders for details).
  2. EBMUD "Field Calibration Tags" shall be properly completed and hung on all instruments in a system and in any related sub-system prior to functional testing of any equipment or other device in that system. Refer to Section 33 12 01 for tag details.

C. Equipment ID Tags:

1. All ID tags and labels on equipment, piping, valves, instruments, conduit and other devices or systems directly or indirectly related to the functional test shall be installed by the Contractor and verified by the Engineer prior to conducting the functional test.

D. Installation witness check of control systems wiring and devices with District staff shall not proceed until the following has been completed:

1. The Contractor has completed an initial un-witnessed loop or point-to-point test prior to requesting District staff to witness functional testing.
2. All field cables and wires are properly pulled, terminated, and labeled per contract requirements and match the latest drawings and interconnects.
3. All piping, conduit, equipment, and systems have been properly tagged and labeled.

E. Functional tests include:

1. Installation Inspection: Check for proper rotation, adjustment, alignment, mechanical and electrical connections, wire labeling, proper lubrication, and any other conditions which may damage or impair functioning.
2. Operation Check: Check for the proper operation of all system components.
3. Controls Check: Demonstrate proper function of all local and remote controls, instrumentation, and other equipment functions.
4. Alarms Check: Simulate alarm conditions and verify the proper operation of each alarm at the specified set point. Simulations shall be by means of direct element stimulation whenever possible, or by other means when direct element stimulation is not practical as determined by the Engineer.
5. Run Check: Each system or equipment item shall be operated continuously for 1 hour, minimum, to verify satisfactory operation. Additional operating time may be required as specified in the individual technical specifications, or as recommended by the manufacturer.
6. The individual technical specifications or the manufacturer may specify additional functional test requirements for each component or system.
7. If any part of a unit shows evidence of unsatisfactory or improper operation during the one-hour test period, or the test period specified by equipment technical specifications, correction or repairs shall be made, and the full test operation, as specified herein, shall be repeated after all parts operate satisfactorily.

## 1.10 PERFORMANCE TESTS

- A. Performance tests shall not proceed until the Functional Test has been successfully completed.
- B. Copies of all prior test results (factory, and field functional tests) shall be available on-site, prior to proceeding with performance tests.
- C. Performance tests shall demonstrate that the equipment or system meets all specified performance requirements; see technical specification sections.

## 1.11 CONTROL SYSTEMS FUNCTIONAL TESTS

- A. The CSFTs shall demonstrate the proper function each process systems' control modes (local manual/automatic, remote manual/automatic) from all interface locations (local and remote).
- B. The District will not begin control systems functional testing until the Contractor has satisfied all prerequisites below:
  - 1. Completed requirement for "Ready for Integration Programming" described in Section 01 11 00 – Summary of Work.
  - 2. All special tools and equipment related to instruments, controllers, and control systems furnished under this contract, including but not limited to HART communicators, shall be provided prior to the start of CSFT.
- C. CSFTs will be completed by District staff with the primary assistance of a qualified representative of the control system equipment supplier provided by the Contractor, and the System Integrator as specified in Section 26 24 19. The Contractor furnished control system representative shall assist District staff in resolving potential conflicts between the control systems and other equipment or systems installed under the contract. The Contractor furnished representative shall be on-site during CSFTs and shall be dedicated only to those activities identified by the Engineer.

## 1.12 OPERATIONAL STARTUP TEST

- A. The facilities startup test shall not proceed until all of the following have been completed:
  - 1. The District has successfully completed all control systems functional testing work specified in this Section during the designated period allotted for the work after "Ready for Integration Programming". See Section 01 11 00 – Summary of Work for additional "Ready for Integration Programming" prerequisites.
  - 2. All other required tests have been completed and accepted by the Engineer. At the Engineer's discretion, selected performance tests may be conducted during the Startup Test period.

3. Copies of all prior tests (factory, field functional, and performance tests) shall be available on-site.
- B. Operational Startup tests shall be scheduled no sooner than 7 calendar days after the projected completion of Functional Testing on all related systems. All equipment/systems required by these specifications shall be included in the Startup Test.
- C. The Contractor shall coordinate with District staff to startup the facility equipment and systems. The District will conduct a seven (7) day Operational Startup test with support of the Contractor, Subcontractors and Vendor Representatives as required by the Engineer to demonstrate to the District's satisfaction that all equipment and systems required by these specifications operate together as intended
- D. The Contractor shall provide qualified personnel to support startup and testing, and appropriate construction trade personnel to correct malfunctions and deficiencies at any time during the Startup Test. Only District personnel shall operate the equipment and systems.
- E. The District will provide Contractor-trained operating personnel for the duration of the Startup Test. The District's operating personnel shall be monitored by the Contractor and/or the manufacturer's representatives to ensure each system is being operated as intended.
- F. The District will determine facility operating parameters such as plant flow rates, chemical dosages, and which systems or equipment will be operated at any given time. All systems and equipment will be operated within their normal operating ranges.
- G. All defects in operation, materials, or workmanship that appear during the Startup Test shall be immediately corrected by the Contractor. In case of a system interruption, the Contractor shall repeat the Operational Startup Test of the affected systems and any other system directly related to the operation of the affected system. The Startup Test shall not be accepted as complete until all systems have successfully operated together to the satisfaction of the Engineer for a continuous seven (7) day period. All costs for corrective work and retesting shall be borne by the Contractor.
- H. System interruptions include the following:
  1. Malfunction or deficiency that results in a shut down or partial shutdown of any system
  2. Malfunction or deficiency in any backup system that cannot be corrected by the Contractor within 4 hours after notification of the problem
  3. Malfunction or deficiency that results in system or equipment performance that is less than specified

- I. The Contractor shall maintain the qualified staff or vendor representatives (either onsite or on-call) to be able to respond immediately (24-hours per day) to system or equipment related questions and to correct deficiencies. The Contractor shall provide a list of qualified staff or vendor representatives to perform troubleshooting services during the Operational Startup period. On call staff shall report to the site within 2 hours of being informed of a deficiency.
- J. The Engineer will maintain a log of equipment or system deficiencies along with the date and time when the Contractor was notified of the deficiency and the date and time when the Contractor notifies the Engineer that the deficiency has been corrected. All corrected deficiencies must be inspected and approved by the Engineer.
- K. The Contractor shall maintain a log of equipment or system deficiencies along with a description of the required repairs necessary to correct the problem. The Contractor shall furnish up-to-date copies of this log to the Engineer upon request.
- L. If the Operational Startup Test is interrupted through no fault of the Contractor, the test may resume at the earliest mutually agreeable time at no additional cost to the District.

## PART 2 - NOT USED

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The Contractor or its qualified equipment manufacturer representative shall perform all functional and performance testing of installed equipment unless otherwise specified. The Contractor shall be present during all testing, even if the specific functional or performance test is performed by its equipment manufacturer representative.
- B. The Contractor shall complete all testing in accordance with the District approved test procedures.
- C. The Contractor, at a minimum, shall maintain and provide to the Engineer, the following records:
  - 1. Daily logs indicating all equipment testing and startup activities and activities of all manufacturers' representatives
  - 2. Records of all tests, calibrations, inspections, adjustments, services and corrective actions taken
  - 3. Copies of all test data collected at the end of each day of testing
- D. In addition to the tests specified in the individual technical specifications, the Contractor shall perform additional tests as required by the Engineer to demonstrate



to the Engineer's satisfaction that all equipment and systems required by the specifications will operate as intended.

- E. If the testing of any equipment may affect the operation of existing District facilities, the testing shall be done under direct supervision of the Engineer. The Contractor shall comply with directions given by the Engineer.
- F. Table 1 is a summary of equipment/systems that require functional, and performance tests. Additional testing may be required when specified elsewhere.

Table 1: Testing Summary			
(Additional tests may be required in other specification sections.)			
Specification Section	System / Equipment Name	Functional Test Required	Performance Test Required
33 56 13.13	Aboveground Diesel Fuel Storage Tanks and Accessories	X	
All equipment/systems required by these specifications shall be included in the Startup Test.			

### 3.2 CONTROL SYSTEMS FUNCTIONAL TESTS

- A. All systems designed for control through PLC or SCADA will require testing. The Contractor shall make scheduling allowances for these tests and incorporate this information into the construction schedule (see Section 01 32 00 – Construction Progress Documentation). If the Engineer identifies deficiencies in workmanship, installation, materials, products, or anything else associated with the Contract work that delays the progress of the CSFT, then the Engineer may require additional time (beyond the number of calendar days specified in Section 01 11 00) to complete the testing to compensate for actual time lost due to troubleshooting and correcting the deficiencies as well as additional time to compensate for testing inefficiencies.

### 3.3 FIELD TESTING COORDINATION MEETINGS

- A. The Contractor shall prepare materials for and attend periodic testing coordination meetings. During periods when field testing occurs regularly, the Engineer will schedule weekly or biweekly field testing coordination meetings. The Contractor's Testing Coordinator shall attend all meetings, and the Contractor shall provide suitable representation from each subcontractor having testing responsibilities so that informed decisions can be made during the meetings.

END OF SECTION

## SECTION 01 77 00

### CLOSEOUT PROCEDURES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION OF PROJECT CLOSEOUT

- A. Project Closeout is hereby defined to include general requirements near the end of the contract time, in preparation for final acceptance, final payment, normal completion of contract, occupancy by the District and similar actions evidencing completion of the work. Individual specification sections may contain additional requirements.
- B. Related Sections:
  - 1. Section 01 50 00 – Temporary Facilities and Controls
  - 2. Section 01 74 05 – Cleaning

##### 1.2 SUBMITTALS

- A. Project Closeout items: Required prior to release of final payment.
  - 1. As-Built and Record Drawings: As required in Section 01 78 39
  - 2. Equipment and Parts Close-out List: A summary list of materials and parts required by the individual specification sections.
  - 3. Special Bonds, Special Warranties, and Service Agreements: As required by individual specification sections. Provide written evidence that these bonds, warranties, and agreements have been satisfactorily performed.
  - 4. Releases from Agreements: As required by individual specification sections.
  - 5. Spare Parts, Special Tools and Extra Material: As required by individual specification sections. Include inventory.
  - 6. Cleaning: As required in Section 01 74 05 – Cleaning.
  - 7. Field Records: As required by individual specification sections.
  - 8. Training: As required by Section 01 79 00 – Demonstration and Training
  - 9. Inspections and certifications from outside agencies: As required by individual specification sections.

#### PART 2 - NOT USED

#### PART 3 - EXECUTION

11/27/07

### 3.1 FINAL CLEANING

- A. Upon completion of work or a part thereof and immediately prior to Contractor's notice of completion, clean the facilities and areas of work or parts thereof, as applicable to this project, per Section 01 74 05.

### 3.2 RESTORATION OF DAMAGED WORK

- A. Restore or replace damaged materials and finishes caused by movement of equipment or other operations as specified or directed by the Engineer, at no additional cost to the District.
- B. Restoration shall be equal to the original Work, and finishes shall match the appearance of existing adjacent Work.

### 3.3 REMEDIAL WORK

- A. Replace Work due to faulty workmanship or materials at no additional cost to the District.
- B. Coordinate Work with the District and perform at such time and manner to cause minimal interruption and inconvenience to the District's operations.

### 3.4 SPARE PARTS, SPECIAL TOOLS AND EXTRA MATERIAL

- A. Upon completion of work for a given facility and immediately prior to Ready for Service, Contractor shall deliver to the District any spare parts, special tools, and extra material if specified by individual specification sections.
  - 1. Products shall be packaged for storage as recommended by the manufacturer. Extra material shall be in original, opened packaging.
  - 2. Products shall be clearly identified by Project name, Specification Section, Article Number, Paragraph and Subparagraph Number, Facility Name, and Tag Number.
  - 3. Delivery shall be to a District facility requested by the Engineer.
  - 4. Provide inventory of all spare parts, special tools, or extra materials provided.

### 3.5 WARRANTIES

- A. Article 10 of the General Conditions cover the Contractor's responsibility to remedy defects due to faulty workmanship and materials that appear within one year, unless noted otherwise, from the date of final acceptance.
- B. Special warranties are required by various sections of the specifications. Assemble written warranties, label and submit to the Engineer.

1. Equipment warranties shall be written in the manufacturer's standard form and shall be countersigned by the subcontractor or supplier and the Contractor.
  2. All other warranties shall be written on the subcontractor's or supplier's letterhead and shall be countersigned by the Contractor.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- D. Additional Requirements
1. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
  2. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
  3. District's Recourse: Written warranties made to the District are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the District can enforce such other duties, obligations, rights, or remedies.
    - a. Rejection of Warranties: The District reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
  4. The District reserves the right to refuse to accept work for the Project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- E. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-inch by 11-inch paper.
1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name, of the product, and the name, address and telephone number of the installer.

2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the Project title or name, and the name of the Contractor.
3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

### 3.6 FINAL INSPECTION

- A. Prior to requesting Engineer's final inspection for certification of final acceptance and final payment, complete the following and list known exceptions (if any):
  1. Submit copy of Engineer's final punchlist of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Engineer.
- B. Contractor shall provide a "Notice of Completion." This notice shall certify in writing that the work has been completed in accordance with the Contract Documents, and request Engineer's final inspection.
- C. Within seven (7) days after receipt of the Contractor's notice that the work has been completed, including punchlist items resulting from earlier inspections, and excepting incomplete items delayed because of acceptable circumstance, the Engineer will reinspect the work. Upon completion of reinspection, Engineer will either prepare a certificate of final acceptance or advise the Contractor of work not complete or obligations not fulfilled as required for final acceptance. If necessary, inspection procedure will be repeated.

### 3.7 RELEASES FROM AGREEMENTS

- A. Furnish District written releases from property owners or public agencies where agreements or special easements have been made, or where Contractor's operations have not been kept within the District's construction right-of-way.
- B. In the event Contractor is unable to secure written releases, inform the Engineer of the reasons:
  1. The Engineer will examine the site, and will direct the Contractor to complete work that may be necessary to satisfy terms of the agreement.
  2. Should Contractor refuse to perform this work, the Engineer reserves the right to have it done by separate contract and deduct the cost of same from the contract price, or require the Contractor to furnish a satisfactory bond in a sum to cover legal claims for damages.
  3. When the Engineer is satisfied that work has been completed in agreement with the Contract Documents and terms of agreements, the right is reserved to waive the requirement for written release if: (1) Contractor's failure to obtain such

statement is due to the grantor's refusal to sign, and this refusal is not based upon any legitimate claims that Contractor has failed to fulfill the terms of the agreement, or (2) Contractor is unable to contact or has had undue hardship in contacting the grantor.

END OF SECTION

## SECTION 01 78 39

### AS-BUILT DRAWINGS

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

- A. As-Built Drawings also known as “project record documents”, or “record drawings” shall show the actual as-constructed conditions of installed or modified systems, equipment and material. The purpose of as-built documents is to provide accurate information for the future modification, expansion, operation, and maintenance of the plant.
- B. The as-built drawings are especially important for recording field conditions of embedded or concealed material and equipment. These embedded or concealed items shall include, but are not limited to, buried structures, thrust restraints, backfill material, piping, cables and raceways.
- C. The Contractor shall maintain up-to-date changes to the record documents continuously as the Work progresses. Annotate the documents to reflect all changes made or encountered during construction. The Contract Documents will be provided in Portable Document Format (PDF), and all annotations and notes shall be made directly to the PDF documents.
- D. Supplementary documents generated during the course of construction, either by the Engineer or Contractor, shall also be in PDF format. The Contractor shall coordinate with the Engineer regarding file management, naming conventions, and coordination of attachments. The Contractor shall designate a single person (plus a backup) to be responsible for record document management who shall be the liaison to the Engineer regarding record drawings and file management.
- E. As-built preparation activities shall clearly be shown as part of the CPM construction schedule.
- F. Additional as-built document requirements may be specified elsewhere which shall be met in addition to the requirements of this section.
- G. Related sections:
  - 1. Section 01 32 00 – Construction Progress Documentation

##### 1.2 VALUES

- A. Project as-built documents have substantial value to the District for Operations and Maintenance of the facility. As such, values are defined in Section 00 32 00 – Construction Progress Documentation. As-built documents for additional work shall meet all conditions of this section.

B. The relative value of as-built documents shall be distributed as follows:

<u>No.</u>	<u>As-built Categories</u>	<u>Drawing Weight</u>
1.	Electrical interconnects and referenced drawings.	10
2.	Loop drawings and referenced drawings, process and instrumentation drawings.	9
3.	Control and logic drawings, schedules and PLC documents; both Engineer and Contractor supplied.	7
4.	Electrical and Instrumentation, Area Control Center connection drawings; both District and Contractor supplied.	5
5.	Process and Piping Schematic, Power, single and three-line drawings.	3
6.	Structural and Civil Site Plan Drawings	4
6.	All other contract drawings.	1

C. Prior to the first monthly progress payment, the Contractor shall calculate the total number of points possible for as-built preparation by multiplying each contract drawing by its assigned weight as listed in Paragraph 1.2.B. For each monthly progress payment thereafter, the Contractor shall calculate the point value for all as-built drawings accepted by the Engineer as complete as of the 25<sup>th</sup> day of that month and divide by the total number of points possible to determine the weighted percent of as-built completion for billing purposes. Contractor shall re-calculate the total number of points possible to account for new drawings issued by the District after the time of bid, at the time of issuance. No additional compensation will be granted for preparation of as-built records for added drawings. See Article 3.4 – Payment.

## PART 2 - PRODUCTS

### 2.1 DISTRICT-SUPPLIED DRAWINGS AND CHANGES TO THE CONTRACT DOCUMENTS

- A. The following District-supplied drawings, contract documents, and PDF files shall be maintained by the Contractor in accordance with this section, for review by the Engineer throughout the construction period, and accepted by the Engineer as a record document after the Contractor has completed construction of the project:
1. Contract drawings and specifications.
  2. Supplemental drawings issued by the District to facilitate completion of the Work. These drawings and documents cover electrical distribution systems,



electrical control panels, instrumentation panels, control panels, Distributed Controls Systems, telephone systems, intercom systems, the sound powered telephone system, PLCs, and terminal panels.

3. Drawings, agreements, tabulations, and schedules supplied by Engineer via the Requests for Information (RFI), Design Change (DC), and Change Order (CO) processes.

## 2.2 CONTRACTOR-SUPPLIED DRAWINGS AND OTHER DOCUMENTS

- A. In accordance with Section 01 33 00 – Submittal Procedures and this section, the Contractor shall supply and maintain the following drawings and other contract documents in both CAD (drawings only) and PDF format for review and acceptance by the Engineer:
  1. Shop drawings generated by Contractor, sub-contractors, vendors/manufacturers or suppliers.
  2. Programmable logic controllers (PLC) and analog controller program documentation with control and logic diagrams which have been submitted for construction.
  3. Documents, drawings, and schedules specified for inclusion in Operation and Maintenance (O&M) manuals.
- B. The Contractor shall extract portions of a shop drawing submittal for attachment to or incorporation with the record documents when so directed by the Engineer.

## 2.3 ELECTRONIC AS-BUILT DRAWINGS

- A. Marked-up as-built drawings:
  1. The Contractor shall maintain project as-built drawings to thoroughly capture the as-constructed and as-left conditions of installed or modified systems, equipment and material.
  2. As-Built Coordinator: The Contractor shall designate in writing, an As-Built Coordinator for the duration of the project who will be responsible and accountable for completing as-built drawings on an ongoing basis in accordance with the requirements of this section. The designated person shall be dedicated to as-built completion and may not be the project manager, scheduler, superintendent, or any person already filling another role on the project except as approved by the Engineer. As-Built Coordinator shall have demonstrable experience coordinating as-built preparation on a similar size or complexity. If, in the opinion of the Engineer, as-builts are of poor quality, incomplete, inaccurate, delinquent, or otherwise non-compliant with the terms of this section, the Engineer may at its sole discretion direct the Contractor to provide supplemental or replacement personnel to bring the as-builts into compliance.

3. The Contractor and its subcontractors shall be certified through training by the software vendor on use of the approved digital documentation software/app prior to project construction. The Contractor shall arrange and pay for a minimum of 2 hours of training for each person granted a license/set including District staff.
4. The Contractor shall provide at least one computer terminal on the project site which can be used by trade workers, superintendents, or other contractor staff to mark-up the electronic as-builts. The computer terminal should be located near a printed plan set and a planset table. The contractor shall provide at least 3 portable tablets or 2 in 1 tablet/computers with a stylus pen to allow for portable mark-ups of the as-built set as construction occurs. These will be used to document field changes and confirm as-built mark-ups in real time with District construction support staff.
5. Referring to an RFI, submittal, or change order is not an acceptable markup. Drawings shall be marked as if they will be sent to a drafter (e.g. if a pipe is moved to a different location from the contract drawings due to an RFI, redline the pipe in the new location, do not just refer to the RFI).
6. Information to be recorded shall include but not be limited to the following:
  - a. Actual routing of electrical conduits including those conduits only indicated in general or diagrammatically on the drawings
  - b. Actual detail used where more than one option is allowed by the contract documents
  - c. Actual location of electrical manholes, handholes, junction boxes, and terminal boxes
  - d. Actual profiles of all underground electrical duct banks
  - e. Actual alignment of installed pipe
    - 1) For all pipelines: The pipeline Station Notes in the Contract Drawings shall be completed with the pipeline stationing and depth of cover.
    - 2) Record any deviations from the design drawings regarding isolation valves, pipe connections, blowoffs, air valves, galvanic anodes and test stations, manhole structures, and other miscellaneous appurtenances. Add/revise line work, callouts and Station Notes, as applicable.
    - 3) Record any deviations from the design drawings regarding pipeline alignment, elevations, materials, outside diameter, and fitting types in the notes. Add/revise station equations, line work, callouts, offsets and Station Notes, as applicable.

- f. Specific details of pipe connections and manhole structures
  - g. Specific details on the installation and connection of mechanical and electrical equipment (e.g., location, wiring, mounting, overall dimensions, etc.).
  - h. Actual details of all material lists and schedules including quantities, descriptions, sizes, model numbers, and materials of construction
  - i. Field dimensions where they differ from those on the drawings
  - j. Other details showing as-built conditions that are shown differently or only in general on the drawings
  - k. Any deviations between the project drawings and the “as found” conditions encountered during the Contractor’s work including location of existing buried features uncovered during construction
  - l. Only symbols and abbreviations shown on District Standard Drawings included in the contract reference drawings shall be used. Where no District symbol or abbreviation is available, industry association standards such as ISA, IEEE, ANSI etc. shall be applicable.
7. The Contractor shall record dimensions and changes during construction and shall submit to the Engineer to review the accuracy and completeness of the as-built data on a monthly basis in accordance with Section 01 32 00.
- a. Red mark-up color shall be used to indicate additions and/or modifications to the drawings.
  - b. Green mark-up color shall be used to indicate deletions to the drawings.
  - c. Yellow mark-up color shall be used to indicate portions of the drawing that have been field verified to confirm portions installed as designed and to show construction progress.
  - d. Blue mark-up color shall be used to indicate instructions or comments to drafting personnel during finalization of the drawings.
  - e. All marks on drawings shall be dark and legible. Text shall be legibly used using the text box icon.
  - f. Only symbols and abbreviations shown on District Standard Drawings included in the contract reference drawings shall be used. Where no District symbol or abbreviation is available, industry association standards such as ISA, IEEE, ANSI, etc. shall be applicable.

B. Record as-built shop and vendor drawings shall be created as described below:

1. Submit record as-built shop and vendor drawings to document any and all design work developed for this project by the Contractor, subcontractors, equipment manufacturers, vendors, or suppliers.
2. Create record as-built shop drawings utilizing MicroStation or AutoCAD software. Drawings shall be sized 22-inch by 34-inch. Other drawing sizes are not acceptable. Manually drafted shop drawings in pencil or ink are not acceptable.
  - a. Provide two sets of record as-built shop drawings in addition to the number and type of shop drawings specified in Article "SUBMITTAL QUANTITIES" below. One Drawings set shall be sized 22-inch by 34-inch, the other 'half sized' 11-inch by 17-inch.
  - b. Record as-built shop drawings shall also be submitted electronically:
    - 1) MicroStation or AutoCAD format and
    - 2) Searchable PDF (compatible with Adobe Acrobat version XI or later).
3. Text size used on drawings shall have a minimum height of 1/10-inch, if computer generated or typed, and 1/8" if printed by hand.
4. Drawings shall contain a 2-1/2" wide by 3/4" high blank box for the Engineer's use, which shall be placed directly against the margin at the bottom right corner of the drawing.
5. Drawings shall also contain the manufacturer's title block at the bottom right side in a boxed area with a maximum size of 8" wide by 4" high. The manufacturer's title block shall contain the manufacturer's name, address, and telephone number, the name of the project as it appears on the cover of the project specifications, the District specification number, a descriptive title for the drawing, the date the drawing was accepted, the total number of drawings included in the set of drawings, and the manufacturer's drawing number.

C. As-Built Log

1. The Contractor shall coordinate with the Engineer to maintain a shared log of as-built for each drawing on the project. The Engineer and the Contractor's designated As-built Coordinator shall review the electronic version of the As-builts drawing files and submit a complete PDF copy of the as-builts to the Engineer.

D. Schedule for submitting Record As-Built Drawings.

1. Contractor shall submit current as-built drawing files, PDF full-size plots of as-built drawings, and as-built log electronically.

2. Final electronic files and one (1) complete plotted full-size hardcopy, and one 11''x17'' print shall be submitted prior to Ready for Service. This submittal shall include all record as-built contract drawings and record as-built shop drawings.
3. Marked-up contract drawings or record as-built contract drawings refers to those drawings originally included in the bid documents, as modified by the Contractor (via hand-markup and electronic update, respectively) to reflect as-built conditions.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Contractor immediately upon setting up the job site field office shall coordinate with the District to provide the training to the Contractor's staff assigned to be responsible for record document management.
- B. Contractor shall begin recording as-built information immediately upon commencement of the Work.
- C. Although some drawings are considered diagrammatic with respect to placement of conduit, piping, etc., Contractor shall closely follow the routing shown. If there are required deviations, Contractor shall record the as-built conditions as work progresses and provide all changes to the as-built documents with dimensions as outlined below:
  1. Buried or embedded items within buildings, tunnels and other structures including but not limited to, piping, thrust restraints, electrical raceways, cables, duct banks, or other related appurtenances, in or under concrete, asphalt or soil, which are not placed as shown on the drawings, shall show as-built dimensions horizontally and vertically from a wall, formed footing, finish floor, ceiling or finish top of curb. Items placed in the center of concrete slabs do not need to have vertical dimensions.
  2. All buried or embedded items as described above which are outside of buildings shall be tied to the plant survey grid system both horizontally and vertically with proper stationing, invert elevations and/or top of buried item. Survey data shall show all transition points (changes in direction, change in elevation, etc.). All items which are installed by horizontal or vertical curves shall show as-built curve data.

### 3.2 MAINTAINING AS-BUILT DOCUMENTS

- A. District-issued Field Instructions, Contract Change Orders (CCOs), along with Clarifications submitted as part of RFIs or other documents between Contractor and the Engineer shall be considered part of the as-built process. The Contractor shall annotate the record documents as follows:

1. Simple modifications: Mark-ups of a stand-alone nature that can be accommodated in the available blank spaces on a drawing without obscuring other information may be annotated directly on the PDF.
  2. Complex modifications and where drawings were used to communicate changes: For changes affecting large portions of drawings or that cannot be accommodated in the available blank spaces, in lieu of fully annotating the drawing, the Contractor may refer to the document directly on the record document and attach a PDF copy of the change to the record documents in a manner approved by the Engineer. All changed work must be identified with clouds around the areas which are modified by the change and referenced to the attached document(s).
- B. Approved shop drawings that provide supplemental information or make minor modifications and clarifications to the Contract Drawings:
1. Simple modifications: For mark-ups of a stand-alone nature that can be accommodated in the available blank spaces on a drawing without obscuring other information, the Contractor shall annotate the change directly on the PDF and provide a reference to the shop drawings submittal.
  2. In areas where detail does not permit showing as-built conditions clearly on contract drawings, but a shop drawing depicts actual as-built condition of the area, the Contractor shall make a reference directly on the record document using the shop drawing submittal number and reference to any PDF drawings used to show the change. The Contractor shall attach a PDF copy of the change to the record documents extracted from the shop drawing in a manner approved by the Engineer. All changed work must be identified with clouds around the areas which are modified by the change and referenced to the attached document(s).
- C. As-built documents shall be kept current using the markup procedures described herein. If in the opinion of the Engineer the as-builts are of poor quality, incomplete, inaccurate, delinquent, or otherwise non-compliant with the terms of this section, subsequent monthly progress payments will be adjusted by the District as described in Article 3.4 until the as-built documents are brought into compliance.

### 3.3 AS-BUILT UPDATE PROCESS

A. General:

1. As previously described herein, all record documents are to be maintained in a in coordination with the Engineer. When record documents are finalized with no additional changes pending, as-built documents shall be submitted electronically.
2. When significant changes to the drawings are required, the Engineer may elect to update the project record drawings at the same time as the Contractor updates its as-built drawings. Following the preliminary review process, the as-

built annotations on the Contractor's drawings will be used to update the District's electronic files and the Engineer will issue a revised drawing to replace the original contract drawing in the Contractor's as-built documentation. The Contractor shall record any further changes to the work on the revised drawing in accordance with this section.

3. Contractor shall submit final as-builts to the Engineer within 30 working days of completion of Commissioning for each area or subsystem, or prior to Ready for Service for each area or subsystem, whichever comes first:
  - a. Contractor shall present a list of documents that have been updated during construction for approval and acceptance by the Engineer.
  - b. For record documents requiring updates, Contractor shall compare all as-built documents with the actual field conditions and show the actual field conditions on the as-built documents before submitting them for review.
4. As-built drawings submitted to the Engineer will be returned without review for any of the following reasons:
  - a. Work has not been completed, including work related to Field Instructions, Change Orders, clarifications, or other agreements pending.
  - b. Not all components and equipment have been properly labeled on the drawings. All equipment numbers (device and equipment number labeling codes) shall be shown on all drawings depicting the equipment. Equipment numbers must be coordinated with the plans and drawings and shown on all District-supplied and all Contractor-supplied drawings that depict equipment. The Contractor shall request equipment numbers from the Engineer for all new equipment installed.
  - c. Actual field conditions are not accurately shown on the documents.
  - d. Drawing cross references are incomplete. District-supplied drawings must be cross referenced to Contractor-supplied drawings and Contractor-supplied drawings must be cross referenced back to the District-supplied drawings.

B. As-built groups and systems:

1. Final as-built documents shall be submitted together in the following logical groups or systems:
  - a. All site drawings including survey data.
  - b. All mechanical equipment and piping related to an area or piping system. Process and Piping Schematics shall be submitted with the mechanical and piping package.
  - c. All structural and architectural data related to an area.

- d. All electrical and instrumentation data related to an area, including Interconnection and Instrument Loop Drawings, together with all associated shop drawings and connection drawings; all related drawings found in the O&M manuals; and Process and Instrumentation diagrams.

C. Preliminary review process:

1. In order to minimize the number of re-submittals, the following procedure shall be used:
  - a. Upon assembly of a as-built submittal, Contractor shall notify the Engineer that drawing ready for review. Prior to review, a list of as-built documents with all drawing numbers, descriptions and originators listed shall be submitted to the Engineer for review. The Engineer will review the list of as-built documents and meet with Contractor to review the submittal for completeness and accuracy. Contractor may be required to add or subtract documents as directed by the Engineer to ensure a complete and reviewable package.
  - b. Some drawings may show work in several areas or systems. The list of as-built documents shall clearly identify drawings of this type. The area on this type of drawing which is to be reviewed as part of this submittal shall be clearly outlined by Contractor.
  - c. Documents that represent more than one area of work must be submitted for each area of work they represent and must receive approval for each area of work.
  - d. After the preliminary review, Contractor shall submit the as-built package with the necessary corrections for as-built review.

D. As-built re-submittals:

1. Returned as-built submittal documents shall be revised per the Engineer's comments. Re-submittal shall be done by using the same submittal number with a numeric suffix after the submittal number. Reference to the previous submittal number and item number is required when resubmitting. Re-submittals shall address all comments from the Engineer. Partial re-submittals will not be reviewed and will be returned in their entirety without review. The Contractor may be back charged for the administrative cost of the District's review of each re-submittal in excess of the first re-submittal.

### 3.4 PAYMENT

- A. No partial payments will be made for incomplete as-built documents.
- B. Only after all the as-built documents for a work activity area have been submitted, received, reviewed and approved, will a progress payment be made.



- C. As-built documents that include more than one area of work activity will only receive payment upon submittal and approval at the final area of work they represent.
- D. Progress payments for District-supplied documents will be made for approved submittals only.

END OF SECTION

## SECTION 01 79 00

### DEMONSTRATION AND TRAINING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Work includes:

1. Perform training of District personnel for furnished or installed equipment, systems and facilities operation. Develop training program including scheduling, and coordination of training activities and training materials. Specific training procedures and requirements found in the technical sections shall also apply.

- ###### B. Contractor shall plan, coordinate, submit deliverables, and execute the training and demonstration requirements for District personnel responsible for operating and maintaining or overseeing the operation and maintenance of furnished, upgraded, or installed equipment, systems, and facilities.

- ###### C. Contractor shall designate a Training Coordinator to serve as the primary contact for the District throughout the duration of the contract unless otherwise requested by the Engineer or agreed upon in writing by the Engineer and the Contractor.

- ###### D. Contractor shall arrange for and secure a videographer to digitally record and professionally edit one session of required training for each installed equipment, system, and facility. Finalized videos shall be provided in MP4 format by electronic transfer.

1. The District uses recordings to remind or familiarize employees with equipment installed on this project and the recommended maintenance procedures. Recordings are not shared outside the District nor made public unless as required by a Freedom of Information Act request.

2. The Contractor is responsible to negotiate as necessary with subcontractors and vendors and sign any agreement required by them (such as non-disclosure or indemnification agreements) in order to satisfy the District's requirement to video record the training. District representatives will not sign any other vendor agreement, waiver, or non-disclosure agreement.

3. The Contractor is responsible for ensuring that all equipment vendors and their representatives are aware of and agree to the requirement to video record the training.

- ###### E. The training for each installed equipment, system, or facility shall consist of a minimum of two identical training sessions. Contractor shall be available to meet with the Engineer and/or assigned representative to coordinate and align technical training planning efforts.

F. Related Sections:

1. Section 01 32 00 – Construction Progress Documentation
2. Section 01 75 17 – Field Testing and Startup
3. Section 26 05 00 – Common Work Results for Electrical

G. All training activities shall be shown on the Contractor's construction schedule in accordance with Section 01 32 00.

## 1.2 SUBMITTALS

A. Contractor shall submit the following items for review and approval to the Engineer.

1. The name and contact information of the Contractor's Training Coordinator.
2. Training Agenda: A training agenda shall be tailored to the project and the Section that it addresses and submitted 60 days before the training is scheduled. It shall include a 1) detailed descriptive course overview, 2) course objectives, 3) course outline, and 4) estimated timing of each topic.
  - a. The submittal and agenda topics shall cite the applicable section and paragraph of the Contract Documents that it fulfills and identify what participants are expected to 1) learn and 2) be able to demonstrate post-training.
  - b. The agenda shall include separate sections that detail topics and learning objectives for 1) classroom instruction and 2) field demonstration.
  - c. Organize training agenda so that O&M Manual topics, Operations topics, and Maintenance topics are separate sections.
  - d. Submit separate agenda for each equipment, system, and facility that requires training.
3. Training Schedule: The proposed training schedule shall include the dates and times for all training sessions. Coordinator shall propose the timing of training in consideration of project milestones and finalize and confirm the number of training sessions and attendees per training session with the Engineer.
4. Course Materials: Electronic copies of course presentations, manual, and all other related course materials including any pre-training instructions, if applicable. Electronic copies must be submitted in a searchable PDF format (i.e., may not be scanned copies or images).
5. Resume: The resume or biography of the proposed technical trainer(s) that demonstrates their qualifications and ability to perform the specified training services.

6. The name and contact information of the videographer.
7. Transmittal sheet confirming that the video has shipped or been submitted to the Engineer.

### 1.3 PLAN

- A. Prior to delivery of training, equipment and systems for which training is specified shall successfully pass Functional Testing and all related submittals, including the O&M Manuals shall have been submitted and approved by the Engineer.

Contractor Training Coordinator shall initiate contact with and arrange to meet with the Engineer to review training requirements, plans, schedules, and other details as determined by the Contractor or Engineer. The training meeting shall occur prior to commencement of Functional Testing. Training shall be completed prior to Startup Testing and "Ready for Service" handoffs.

Unless otherwise stated, the meeting shall be held at the District Administration Building (375 11<sup>th</sup> Street, Oakland), or at other location as determined by the Engineer. Subsequent meetings may be required until all issues are adequately addressed.

Approved training representatives of the manufacturer(s) shall be present at the training meeting; however if unable to attend, the Contractor shall make an effort to include them via teleconference. The Contractor shall submit Operations & Maintenance (O&M) Manuals for Engineer review and approval prior to the meeting for all equipment and systems for which technical training is specified. The final approved O&M Manuals shall be provided to the Engineer (in print and electronic format) prior to the meeting.

- B. Training shall include a thorough review of the final approved O&M manual, project maps, drawings, and diagrams (e.g. single-line). Topics shall specifically address the maintenance and operation of applicable equipment/systems/facilities.

1. Review of O&M manual contents including:

- a. Procedures for contacting the manufacturer's representative for equipment field service
- b. Procedures for ordering parts
- c. Discussion of equipment warranty

2. Maintenance of applicable equipment/system/facility including:

- a. Learning objectives
- b. Routine and preventive maintenance procedures
- c. Adjustment procedures

- d. Overhaul procedures
  - e. Identify lubrication and adjustment locations
  - f. Maintenance access locations
  - g. Maintenance safety precautions
  - h. Troubleshooting guide
  - i. Field test procedures
3. Operations of applicable equipment/system/facility including:
- a. Learning objectives
  - b. Principles of operation
  - c. Discussion of all design features
  - d. Startup, shutdown, and emergency operating procedures
  - e. Operational safety precautions

#### 1.4 TRAINING COORDINATOR

- A. The Contractor Training Coordinator shall coordinate with equipment vendors to prepare and submit a training agenda and a schedule to the Engineer. See Submittals for document requirements.
- B. The Contractor Training Coordinator shall coordinate with the Engineer and vendors to organize and plan training sessions in advance. Responsibilities include, but are not limited to:
  - 1. Contribute to planning and coordinating the logistics and supervision of each training session.
    - a. Unless otherwise specified, minimum class duration of 4 hours (exclusive of travel time). Typical class size is 12 attendees but may vary. Each training event required in the Contract Documents, regardless of duration, requires delivery of two separate sessions with the second instance being a repeat of the first instance.
    - b. More than one training session shall not be scheduled on the same day without prior approval from the Engineer. Training sessions lasting less than 8 hours shall be completed within the same day.
    - c. Training sessions shall not be scheduled concurrently unless approved by the Engineer.

- d. Training shall be conducted during normal District work hours and scheduled on Tuesday through Thursday, unless approved by the Engineer.
  - e. Technical training shall take place at District facilities in the San Francisco Bay area, Upcountry, or other locations as determined by the Engineer unless otherwise specified.
  - f. Contractor Training Coordinator shall provide equipment or accessories needed to deliver training including laptop computer, cables, power cord, overhead projector, screen, white board, flip chart, etc. Contractor Training Coordinator shall notify Engineer in advance of any District-supplied equipment requirements.
2. Coordinate and schedule manufacturer visits for training.
    - a. Coordinator shall familiarize training representatives with the installation site prior to training.
  3. Ensure that copies of training agenda, manuals, and handouts are printed and available for all training attendees.
  4. Arrange for digital video-recording of one session of a repeated training session and submit the final product in MP4 format to the Engineer in a timely manner. Coordinator shall notify Engineer of shipment of the video. Video recordings are intended solely for District use. Coordinator may engage a vendor of their own choosing. Engineer can provide a list of professional videographers upon request.
  5. Arrange refreshments:
    - a. For training session durations of four hours or less: provide a continental breakfast or refreshments for all attendees, videographer, and trainers.
    - b. For training session durations of more than four hours: provide a continental breakfast and lunch for all attendees, videographer, and trainers.
  6. Advise the Engineer in writing and at least 10 working days in advance of the need to coordinate equipment outages to support training or demonstration of equipment and systems.

PART 2 - NOT USED

PART 3 - EXECUTION

### 3.1 DESCRIPTION

- A. Table 1 summarizes the equipment, systems, or facilities for which training is required. Table 1 may not be all-inclusive. Contractor shall fulfill all training indicated in the Contract Documents whether or not it is listed in Table 1.

- B. Training, as specified in Table 1 of this section or referenced in the other sections of the contract documents, shall include both classroom instruction and hands-on field demonstrations. With Engineer approval, classroom instruction may be conducted in the field.
- C. The Coordinator shall ensure that all equipment and materials required to properly train and demonstrate operational and maintenance procedures as specified in the corresponding section and paragraph are provided.
- D. The Training Coordinator shall ensure that the training room is returned to original condition after each training session is finished.
- E. Training Acceptance: Training shall meet the criteria listed below. Training not meeting the criteria shall be corrected and re-delivered at the Contractor's expense inclusive of District labor costs.
  - 1. All information necessary to properly operate and maintain the system or equipment shall be presented and demonstrated.
  - 2. Training delivered shall be consistent with the submitted and approved training lesson plan.
  - 3. The trainer's expertise shall be sufficient to accurately respond to District questions related to system or equipment operation, maintenance, or principles of operation.
  - 4. The trainer shall demonstrate strong presentation skills and English language proficiency.
  - 5. Training shall be efficient and without unrelated or irrelevant discussion. Breaks during training sessions shall be limited to 10 minutes per two hours of instruction, or one 15-minute break per four hours of instruction.
  - 6. Training Evaluation: Attendees will evaluate the training at the end of each session. The evaluations are one means the District uses to determine if the training adequately instructed District personnel on the proper operation and maintenance of the systems and equipment provided. A typical training evaluation form is included in Appendix A.
- F. Table 1 is a summary of equipment/systems that require training. Additional training might be required when specified elsewhere.

Table 1: Training Summary

(Additional Training may be required in other Sections)

Specification Section & Paragraph	System / Equipment, or Facility
33 56 13.13	Aboveground Diesel Fuel Storage Tanks and Accessories

END OF SECTION



## SECTION 01 91 13.10

### ASSET IDENTIFICATION TAGS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work includes: Furnish and install equipment tags on all equipment, valves and instruments as listed on the drawings and as specified herein.
- B. Related work specified elsewhere:
  - 1. Section 22 05 53.05 – Pipe Identification
  - 2. Section 26 05 53 – Identification for Electrical Systems
  - 3. Division 33 – Utilities
  - 4. Appendix A – Asset List Instruction Sheet
  - 5. Appendix A – Preliminary Asset List Spreadsheet Sample

##### 1.2 SUBMITTALS

- A. The Asset List Spreadsheet: The Contractor shall use the MS Excel spreadsheet provided by the District for all Asset List Spreadsheet submittals. All submittals of this spreadsheet shall be in MS Excel electronic format; pdf or other formats are not acceptable for these submittals.
- B. Submit prior to tag procurement:
  - 1. Descriptive Literature for the Tags: The literature and drawings shall contain the manufacturer's name, description, manufacturers' product data, and the full item number or designation.
  - 2. Preliminary Asset List Spreadsheet: The Asset List Spreadsheet (see preliminary list samples in Appendix A) listing all new and existing devices that require equipment tags, including any revisions or additions of equipment that occurred during the Work. The Preliminary Asset List shall include all known equipment information from approved technical submittals. Refer to the Asset List Instruction Sheet included in Appendix A for detailed explanation of list requirements and examples.
    - a. For projects involving multiple facility numbers, the Preliminary Asset List Spreadsheet will be provided as a MS Excel workbook. Within the workbook, a separate asset list spreadsheet (tab) will be provided for each facility.

- b. The Engineer will provide information in Columns 1 through 6 for assets added via Design Change (DC) to the Contractor. Add the specific equipment information from approved technical submittals. Maintain and update the Asset List during the contract. Ensure the updated Preliminary Asset List is accurate and submit it to the Engineer for approval prior to tag procurement.
  - c. Fabricate equipment asset tags based on the information listed in Columns 1 through 3 of the approved updated Preliminary Asset List. Install asset tags upon completion of equipment installation, prior to field testing as specified in Section 01 75 17.
- C. Submit prior to Ready for Service Milestone:
- 1. Final Asset List Spreadsheet: After all tags have been installed and accepted by the Engineer and prior to reaching the Ready for Service milestone, complete Columns 7 through 10 for all new assets and verify all other information in the Preliminary Asset List is accurate.
  - 2. Submit a Final Asset List Spreadsheet for each facility with all applicable columns completed for all new and existing devices, which includes all tags actually installed with any revisions or additions to the Preliminary Asset List Spreadsheet. Submit completed Final Asset List Spreadsheet in MS Excel format to Engineer approval.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Tag Format: Tags shall include labeling information as shown on the Equipment Tag Detail on Drawing 9492-G-007. Tag fields including the location, system code, equipment code, equipment ID and modifiers shall be per the P&IDs and as shown on other drawings.
- B. Tag Construction: Tags shall be constructed of two-ply laminated plastic.
  - 1. Hanging tags shall be 1" x2-½"x1/16" thick, minimum.
  - 2. Cabinet tags shall be ¾" x2-½"x1/16" thick, minimum.
- C. Tag Colors: Tag lettering and background colors shall be per the table "Facility Related System Codes & Tag Colors" on Drawing 9492-G-007. Colors shall conform to the safety colors prescribed in ANSI Z535.1-1998, "Safety Color Code", unless otherwise specified.
- D. Tag Attachment (unless otherwise noted):
  - 1. Hanging Tags: Tag fasteners shall be plastic coated, flexible, multi-stranded 18-8 stainless steel cable. Cable shall be 7x7 strand core 0.036" cable diameter

minimum with 0.044" coating diameter. Nylon ties are not acceptable. Clamps shall be stainless steel crimped clamping sleeves. Lead clamps are not acceptable.

- a. Acceptable cable products: McMaster-Carr 8930-T28 or equal as approved by the Engineer.
  - b. Acceptable clamping sleeve products: McMaster Carr 3755T11, or equal as approved by the Engineer.
2. Cabinet Mounted Tags: Epoxy adhesives.
  3. Buried Valves: Attach with either epoxy adhesives, or stainless steel cable as specified for hanging tags, as appropriate.
- E. Tag Text: Furnish tag numbers as shown in the tag number bubbles of the site components on the P&IDs, mechanical and electrical drawings, or as called out in the individual specification sections.
- F. Acceptable Manufacturers and Products:
1. Seton, Custom Engraved Plastic Name Plates
  2. Emedco, Custom-Worded Engraved Plates
  3. Or equal as approved by the Engineer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Equipment tags shall be installed in a neat and workmanlike manner, and firmly secured by the specified attachment method.
- B. Cabinet tags or nameplates shall be permanently attached to the device specified and located on the device so as to be easily read under normal operation of the device. Cabinet tags or nameplates shall not alter nor limit the rating, function, UL listing, and enclosure NEMA rating of the device. Cabinet tags or nameplates shall be smoothly attached to the device with no overlaps, protrusions, or sharp edges and corners.
- C. Cabinet tags or nameplates shall be installed on the doors or covers of all panels, panelboards, starters, contactors, relays and all other electrical equipment enclosures furnished under this Contract and as indicated on the drawings.
- D. Cabinet tags or nameplates shall be engraved with inscriptions as shown on the drawings; if not shown, Contractor shall submit a schedule showing what is shown as well as what is proposed for the Engineer's approval.

- E. Each device which indicates the operation of the equipment, or which may be operated to affect the equipment, shall have an integral cabinet tag or nameplate indicating the device function. These shall be inscribed as indicated on the drawings or as approved by the Engineer.
- F. Where attachment of tags to the equipment by cable is not appropriate, tags shall be affixed with stainless steel screws or epoxy adhesive as approved by the Engineer.
- G. Tag Placement:
  - 1. All equipment tags shall be installed on the equipment that it identifies.
  - 2. Equipment tag installation position shall not impede the operation of the device to which it is attached.
  - 3. Equipment tags shall be located in a readily visible location.
  - 4. Specific placement of each tag is subject to approval by the Engineer.
- H. Buried Valves: Attach the tag to the inside face of the valve pot or to the valve access sleeve, whichever location provides greater visibility from above (ref. District Standard Drawing 321-EA). Attach the tag so that it does not interfere with the cover or access to the nut. Tag may be attached by these methods as appropriate:
  - 1. Heat and bend the tag to the curvature of the sleeve or pot and epoxy to the face.
  - 2. Cable the tag to predrilled holes in the face of the access sleeve.

### 3.2 VALVE POT COVER MARKINGS

- A. Apply welded tag numbers to the top of new and existing valve pot covers. Tag numbers shall be welded with a minimum 1/8-inch diameter stainless steel (300 series) electrode, with the weld centered on the top of the valve pot cover. The welded letters shall have a minimum height of 1-inch.
- B. Affix a valve rotation sign to the underside of valve pot covers with an industrial grade adhesive. The signs shall be 2-1/2 inches in diameter and are District furnished (available upon request).

END OF SECTION

## SECTION 02 41 13

### SELECTIVE SITE DEMOLITION

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Work includes: Perform selective demolition including removal and disposal of structures, roofing, finishes, paving, landscape, pipelines, mechanical equipment and other work as shown on the drawings and as specified herein.
- B. Acquire demolition permits from Contra Costa County and follow all requirements.
- C. Related sections:
  - 1. Section 01 32 00 – Construction Progress Documentation
  - 2. Section 01 35 24 – Project Safety Requirements
  - 3. Section 01 35 44 – Environmental Requirements

##### 1.2 JOB CONDITIONS

- A. Asbestos-related work and hazardous substance removal work shall be performed by Contractor who is properly certified by the Contractors State License Board and registered with the Division of Occupational Safety and Health.
- B. Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the District.
- C. Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
- D. Provide interior and exterior shoring, bracing, and support to prevent movement, settlement or collapse of structures and adjacent facilities to remain.
- E. Blasting is not permitted.

##### 1.3 SUBMITTALS

- A. Submit Construction and Demolition Waste Disposal Plan in accordance with Section 01 35 44.
- B. Submit demolition plan showing schedule of phased demolition, as part of and consistent with the progress schedule specified in Section 01 32 00, hazard control methods, plans to stabilize structure while not in the active stages of demolition, and method of demolition proposed at each site.

- C. Submit plan on methods and materials to be used to protect operating equipment during demolition operations for the Engineer's approval.
- D. Shop drawings: Proposed shoring plans stamped by a Civil Engineer registered in the State of California.

## PART 2 - NOT USED

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Demolition operations shall be conducted in accordance with Article 31 of the Construction Safety Orders, Title 8, California Code of Regulations.
- B. Conduct demolition operations and removal of debris to ensure minimum interference with roads, walks, and other adjacent occupied or in-use facilities to remain as shown on the drawings.
- C. Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.
- D. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt dispersion. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations.
- E. Remove, handle, and dispose of off-site, in a safe, appropriate, and lawful manner, and in accordance with Site Safety and Health Plan, all materials and equipment that are required to be removed under this contract.
- F. Verify that abandoned wiring and equipment serve only abandoned facilities.

### 3.2 PREPARATION

- A. Utilities:
  - 1. Notify District or appropriate utilities to turn off affected services before starting demolition.
  - 2. Remove utility lines exposed by demolition excavation.
  - 3. Disconnect electrical systems in walls, floors, and ceilings to be removed.
  - 4. Coordinate utility service outages with utility company.
  - 5. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

6. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.

### 3.3 NOT USED

### 3.4 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- E. Repair adjacent construction and finishes damaged during demolition and extension work.
- F. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

### 3.5 CLEANING AND REPAIR

- A. See Section 01 35 44 – Environmental Requirements
- B. Clean and repair existing materials and equipment that remain or that are to be reused.

### 3.6 NOT USED

### 3.7 DEMOLITION

- A. Drawings define minimum portions of structures, facilities, and equipment to be removed. Unless otherwise shown, rough cuts or breaks may be made exceeding limits of demolition shown.

- B. Remove material from existing improvements as required to permit connection of new work. Avoid both damage to the portion to remain, and interference with the use and operation of existing structures and utilities.
  - 1. Pavement to be removed shall be saw cut to a uniform line prior to removal.
  - 2. Shut off, cap, or otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction.
  - 3. Completely remove all materials designated for removal as shown on the drawings.
- C. Remove piping from areas to be backfilled. Pipe, valves, and fittings adjacent to those to be removed may also be removed as salvage.
- D. Remove all materials associated with existing equipment that is to be removed or relocated.
- E. Cut off concealed or embedded piping, conduit, boxes, reinforcing steel, anchor bolts, or other materials a minimum of 3/4" below the final finished surface.
- F. Patch existing surfaces to create a neat, smooth appearance. Use non-shrink grout to patch concrete or masonry surfaces. Use like materials for other surfaces.

### 3.8 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove, handle, and dispose of off-site, in a safe, appropriate and lawful manner, and in accordance with Section 01 35 44, all materials that are required to be removed under this contract.
- B. Underground conduits, pipes, and drainage facilities that are to be demolished shall be removed flush with any excavation and a 0.5 foot thick plug of concrete placed securely in the pipe end to provide closure.
- C. Burning of removed materials is not permitted on the site.
- D. The existing electrical equipment at the Sobrante Water Treatment Plant, may contain polychlorinated biphenyls (PCB's) when demolishing and shall require special handling.

### 3.9 NOT USED

END OF SECTION



## SECTION 02 65 00

### UNDERGROUND STORAGE TANK REMOVAL/ABANDONMENT

#### PART 1 - GENERAL

##### 1.1 SECTION INCLUDES

- A. Removal and disposal of underground storage tanks and connected piping.
- B. Cleaning and vapor freeing of tanks.
- C. Fuel removal.
- D. Temporary containment of excavated soil.
- E. Testing soils for contamination.
- F. Disposal of contaminated soil.
- G. Water disposal.
- H. Providing reports required by regulatory agencies.
- I. Backfilling.

##### 1.2 REFERENCE STANDARDS

- A. API RP 1604 – Closure of Underground Petroleum Storage Tanks; 1996 (R2010).
- B. 29 CFR 1910 – Occupational Safety and Health Standards; current edition.
- C. 29 CFR 1910.38 – Emergency action plans; current edition.
- D. EPA SW-846 – Test Methods for Evaluating Solid Waste, Physical/Chemical Methods; Current Edition.
- E. EPA 600-4-790-20 – Methods for Chemical Analysis of Water and Wastes; 1983.

##### 1.3 SUBMITTALS

- A. See Section 01 33 00 – for submittal procedures.
- B. Site Safety and Health Plan: Describe safety and health plan and procedures as related to underground tank removal and pipe removal, and as related to operations associated with petroleum contaminated soils and water.

- C. Excavation and Material Handling Plan: Describe methods, means, equipment, sequence of operations and schedule to be employed in excavation, transport, handling, and stockpiling of soil during underground tank removal.
  - 1. Submit to Engineer fifteen days before beginning tank removal work.
  - 2. Include a material handling plan that describes phases of dealing with the contaminated soil and water as it relates to the proposed tank and piping removal.
  - 3. Include methods of excavating, a material handling plan for the contaminated material, soil testing requirements, safety precautions and requirements, and water pumping and collection requirements.
  
- D. Field Sampling and Laboratory Testing Plan: Describe field sampling methods and quality control procedures.
  - 1. Identify laboratory and laboratory methods to be used for contamination testing.
  - 2. Sample reports shall show sample identification for location, date, time, sample method, contamination level, name of individual sampler, identification of laboratory, and quality control procedures
  
- E. Tank and Piping Removal and Disposal Plan: Describe methods, means, sequence of operations, and schedule to be employed in the testing, pumping, cleaning, de-vaporizing, inspecting, removal, and disposal of underground storage tanks and piping.
  
- F. Reports:
  - 1. Identification of tanks removed and disposed of, including site map showing location of tank and piping.
  - 2. Starting and ending dates of reporting period.
  - 3. Closure report. Incorporate reports, records, and data into a single binder with the title "SITE ASSESSMENT REPORT" on the cover of the binder.
  
- G. Record Documents:
  - 1. Building permit, inspection permits, and other permits required for underground tank removal. AST and UST closure applications and approvals from Contra Costa County Health and Fire Departments.
  - 2. Results of excavation, including sketch showing location of underground storage tank, sampling locations, and extent of excavation.
  - 3. Tank disposal paperwork, such as copy of UST Notification Form and method of conditioning tank for disposal.

4. Contaminated soil disposal paperwork, such as laboratory testing reports.
5. Contaminated water disposal paperwork, such as laboratory testing results.

#### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with local, state, and federal regulations and 40 CFR 280.
  - a. Qualifications: Prior to start of work, submit documentation of recent experience and resumes of personnel working on the project.
  - b. Data shall indicate that tank removal contractor, subcontractors, and personnel employed on the project have been engaged in removal, transportation, and disposal of underground tanks and associated piping, are familiar with and shall abide with the following:
    - c. Applicable safety rules and regulations.
    - d. Excavation, testing, and disposal of petroleum contaminated soils, liquids, and sludge.
    - e. Provide documentation that tank removers are certified if locality of project has this requirement.
    - f. Furnish the name and qualifications of the proposed Site Safety and Health Officer, based on education, training, and work experience.
- B. References: Furnish data proving experience on at least three prior projects that included types of activities similar to those in this project. Provide project titles, dates of projects, owners of projects, point of contact for each project, and phone numbers of each point of contact.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

##### 3.1 PREPARATION FOR TANK REMOVAL AND DISPOSAL

- A. Site Safety And Health Plan (SSHP): Furnish safety, health, and accident prevention provisions and develop a Site Safety and Health Plan (SSHP).
- B. Site Safety And Health Officer: Identify an individual to serve as the Site Safety and Health Officer (SSHO) who is a Certified Industrial Hygienist (CIH).
  1. The SSHO CIH shall report problems and concerns regarding health and safety to the Engineer.

2. The SSHO CIH shall have a working knowledge of local and Federal occupational safety and health regulations and shall provide training to Contractor employees in air monitoring practices and techniques.
  3. The SSHO CIH shall also provide day to day industrial hygiene support, including air monitoring, training, and daily site safety inspections.
  4. The SSHO CIH shall be trained in the use of the monitoring and sampling equipment, interpretation of data required to implement the SSHP, and to administer the elements of the SSHP.
  5. The SSHO CIH shall remain on site during project operations and may be assigned other duties, such as project foreman or quality control manager.
- C. Exclusion Zone (EZ) And Contamination Reduction Zone (CRZ): Do not permit personnel not directly involved with the project to enter work zones, called the EZ and CRZ.
1. The EZ shall be an area around the tank a minimum of 10 feet (3 m) from the limits of the tank excavation.
  2. At the perimeter of the EZ, establish a CRZ.
  3. The Contractor's site office, parking area, and other support facilities shall be located outside the EZ and CRZ.
  4. Clearly mark and post the boundaries of the EZ and CRZ.
  5. Include a site map, outlining the extent of work zones and location of support facilities, in the SSHP.
- D. Training: Provide health and safety training in accordance with 29 CFR 1910 prior to starting work.
1. On-Site Training: Prior to starting on-site work, a health and safety training class shall be held by the SSHO CIH to discuss the implementation of the SSHP.
  2. Notify the Engineer 24 hours prior to beginning the training class.
- E. Personnel Protection: Furnish appropriate personal safety equipment and protective clothing to personnel.
1. Ensure that safety equipment and protective clothing is kept clean and well maintained.
- F. Decontamination: Decontaminate or properly dispose of personal protective equipment and clothing worn in contaminated areas at the end of the work day.

1. The SSHO CIH shall be responsible for ensuring that personal protective clothing and equipment are decontaminated before being reissued.
- G. First Aid and Emergency Response Equipment and Procedures: Provide appropriate emergency first aid equipment for treatment of exposure to site physical and chemical hazards.
1. Provide and post a list of emergency phone numbers and points of contact for fire, hospital, police, ambulance, and other necessary contacts.
  2. Provide and post a route map detailing the directions to the nearest medical facility.
- H. Ignition Sources: Do not permit ignition sources in the EZ and CRZ.
- I. Waste Disposal: The SSHP shall detail the practices and procedures to be utilized to dispose of wastes. Upon completion of the project, certify that equipment and materials were properly decontaminated prior to being removed from the site.
- J. Emergency Response Requirements: Furnish emergency response and contingency plan in accordance with 29 CFR 1910.38.
1. In an emergency, take action to remove or minimize the cause of the emergency, alert the Engineer, and institute necessary measures to prevent repetition of the emergency.
  2. Equip site-support vehicles with route maps providing directions to the medical treatment facility.
- K. Unforeseen Hazards: Notify the Engineer of any unforeseen hazard or condition that becomes evident during work.

### 3.2 TANK CLEANING

#### A. Fuel Removal:

1. All possible fuel will be pumped or otherwise removed from the tank by Owner.
2. Contractor to remove remaining fuel emulsions and dispose of remaining fuel emulsions in accordance with applicable local, state, and federal regulations.
3. Tank Cleaning to be done in accordance with the Uni-docs "Tank System On-Site Cleaning Application" (UN-065) included as an attachment.

### 3.3 TEMPORARY CONTAINMENT OF EXCAVATED SOIL

- #### A. Provide temporary containment area near the excavated area.

### 3.4 EXCAVATION

- A. Provide Engineer with written documentation, no later than 30 days before work begins, that proper state or local authorities have been notified.
- B. Notify Engineer at least 48 hours prior to start of tank removal work. Coordinate with Contra Costa County Building and Planning Department for required inspection.
  - 1. Stage operations to minimize the time that tank excavation is open and the time that contaminated soil is exposed to the weather.
  - 2. Provide protection measures around the excavation area to prevent water runoff and to contain the soil within the excavation area.
- C. Excavation: Excavate as required to remove tanks and piping.
  - 1. Place soil removed from the excavation in a temporary containment area.
  - 2. Collect and temporarily store water runoff from stockpiled soils.
- D. Excavation Methods: Select methods and equipment to remove soil to minimize disturbance to areas beyond the limits of the excavation area.
  - 1. Material that becomes contaminated as a result of Contractor's operations shall be removed and disposed of at no additional cost to Owner.
  - 2. Where excavation extends into groundwater levels, dewatering methods shall be employed on a localized basis to facilitate excavation operations, as specified in Section 01 7000.

### 3.5 TESTING

- A. Excavated Soils: No excavated soils to be reused as backfill and to be disposed of off-site.
  - 1. Excavated soils to be profiled in accordance with requirements of the disposal facility.
  - 2. Furnish results to Engineer within 24 hours after the results are obtained.
- B. Testing Under Tank After removal of Tank:
  - 1. Furnish results to Engineer within 24 hours after the results are obtained.
- C. Testing Along Piping:
  - 1. Testing shall be done in accordance with the Uni-docs "Underground Storage Tank System and Sump Closure Requirements" (UN-002) included as an attachment.

### 3.6 WATER DISPOSAL

- A. Dewatering will be permitted only with approval of Engineer.
- B. Store and test water generated during removal of tanks and piping.
  - 1. If contaminated, transport and dispose of water in an EPA approved disposal site in accordance with federal, state, and local requirements.
  - 2. Non-contaminated water may be disposed of on-site.

### 3.7 DISPOSAL OF UNDERGROUND TANKS, ANCHORS, SLABS, AND ASSOCIATED PIPING

- A. Preparation: API RP 1604. Remove the fill pipe, gage pipe.
  - 1. Cap or remove non-product piping, except vent piping.
  - 2. Plug tank openings so that vapors will exit through vent piping during the vapor-freeing process.
- B. Purging: Remove flammable vapors in accordance with API RP 1604. Tanks shall be certified as "vapor free" prior to further work.
- C. Cleaning and Testing: Clean tank and perform atmosphere testing in accordance with API RP 1604.
  - 1. Distribution (product delivery) piping shall be cleaned and removed or the piping shall be cleaned, filled with concrete, and abandoned in place.
  - 2. Test the tank atmosphere and the excavation area for flammable or combustible vapor concentrations, with a combustible gas indicator until the tank is removed from the excavation and from the site.
- D. Tank Removal and Disposal:
  - 1. Plug or cap accessible holes. One plug shall have a minimum 1/8 inch (3 mm) vent hole.
  - 2. Remove tank from the excavation, place it on a level surface and render it useless in accordance with API RP 1604.
  - 3. Provide warning labels on tank if tank contained leaded fuels, as follows:
    - a. SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR HUMAN OR ANIMAL CONSUMPTION -- DATE OF REMOVAL: MONTH/DAY/YEAR"
  - 4. Transport and dispose of tank at an EPA approved disposal site in accordance with federal, state, and local regulations.

3.8 CLOSURE REPORT (SITE ASSESSMENT REPORT)

- A. Complete Unidocs "Underground Storage Tank System Closure Permit Application" (UN-003), included as an attachment.

3.9 BACKFILLING

- A. Provide backfill, compaction, grading, and seeding in accordance with Section 31 23 23.

END OF SECTION



## SECTION 03 30 00

### CAST-IN-PLACE CONCRETE

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. Section includes: Cast-in-place concrete required for this work is shown on the drawings and includes but is not necessarily limited to:

1. Miscellaneous Small Structures

##### 1.2 QUALITY ASSURANCE

A. Qualifications of workers:

1. A foreman experienced in work being done shall be on the jobsite at all times.

B. Codes and Standards:

1. Comply with all pertinent recommendations of "Structural Concrete for Buildings", publication ACI 301 of the American Concrete Institute.
2. State of California Department of Transportation: Standard Specifications, latest edition (CSS).

C. Testing:

1. District will inspect and will perform concrete slump and strength tests. Strength tests on concrete cylinder samples will be performed in accordance with ASTM C39.
2. Strength tests on core samples will be performed in accordance with ASTM C42.

D. Concrete Samples:

1. Contractor shall provide all labor and equipment required to make the concrete samples, store them on site during initial cure, and deliver concrete cylinder samples to EBMUD Materials Testing Laboratory located at the address listed in Article 1.3.
  - a. Samples shall be made by an ACI certified Concrete Field Testing Technician in accordance with ASTM C31 and ASTM C172.
  - b. Unless specified otherwise, one set of five 6"x12" cylinders shall be molded at the same time of each mix being placed, each day:
    - 1) At least once a day

- 2) At least once for each 100 cubic yards placed, and
- 3) At least once for each 5,000 square feet of surface area of slabs and walls.

c. Label samples using a nomenclature provided by the Engineer.

E. Additional Core Samples and Tests:

1. If, in the opinion of the Engineer, results of tests on concrete cylinders indicate the possibility of substandard concrete in the structure, cored samples may be required to be taken from the placed concrete. The contractor shall provide all labor and equipment required to obtain the core samples.
  - a. The contractor shall take 3 cores of the area representing the cylinders in which the strength is in question and deliver them to EBMUD Materials Testing Laboratory for strength tests.
    - 1) Core samples shall be obtained in accordance to ASTM C42.
  - b. If the results of the core tests indicate the concrete that has been placed does not meet the specification, remove and replace the defective concrete at no additional cost to the District.
  - c. The Contractor may be reimbursed per Document 00 72 00 Article 7 for the coring cost if test results on the core samples indicate that the placed concrete meets the specification, and if it can be demonstrated that the original concrete cylinder samples were properly obtained.

F. Concrete Mix:

1. The design of the concrete mixtures shall be the responsibility of the Contractor, and shall be subject to review and approval by the Engineer.
  - a. Concrete mix shall be designed, in accordance with ACI 318, Chapter 26, by an approved independent testing laboratory, employed by the Contractor, and the design submittal shall be signed by a California-registered Civil or Structural Engineer.
    - 1) The testing laboratory shall submit certified copies of all laboratory trial mix reports to the Engineer.
    - 2) Do not place concrete prior to the Engineer's review of test reports and approval of mix design.
  - b. Concrete shall be composed of a cementitious material, water, fine and coarse aggregates and admixtures.
  - c. The cementitious materials shall be Portland cement or Portland cement in combination with pozzolan.

- d. The admixture shall be an air-entraining agent plus either a water reducing admixture or a water reducing retarding admixture as approved by the Engineer.
  - e. The proportions of all material used in the concrete shall conform to the approved mix design. Adjustments may be made to the batch weights or cement and water as necessary to maintain the water-cement ratio and the stipulated slump, with approval of the Engineer.
2. Minimum content of cementitious materials in structural concrete shall be as follows:

<u>Cementitious Material Used</u>	<u>Minimum Content in Pounds Per Cubic Yard of Concrete</u>
a. Portland cement only	500
b. Portland cement in combination with pozzolan	450 - cement, and 75 - pozzolan
	75 - pozzolan

3. Aggregate content: The nominal maximum size of aggregate used in structural concrete shall conform to the following requirements:

<u>Locations</u>	<u>Size</u>
a. Sections over 8 inches in thickness in which the clear distance between reinforcement is at least 2-1/4 inches.	1" x No. 4
b. Sections 8 inches or less in thickness or with a clear distance between reinforcement less than 2-1/4 inches.	3/4" x No. 4

Note: The nominal maximum size aggregate shall not be increased for these features, but may be decreased for sections requiring a special quality of concrete as directed by the Engineer.

4. Air Content:
- a. The air content by volume based on measurement made immediately after discharge from the mixer shall be determined by ASTM C231.

- b. The total calculated air content of the sample prepared in accordance with ASTM C231 shall be between 2% and 4%.

G. Quality Control:

1. Batch plant shall be approved by the Engineer in advance of use for this work.

### 1.3 SUBMITTALS

A. Submit concrete mix design to the Engineer for approval.

B. Representative samples of materials required for testing under this section shall be submitted to the EBMUD Materials Testing Laboratory, 1100 21st Street, Oakland. A minimum of one day in advance, make an appointment for the sample delivery by calling the laboratory at (510) 287-1990 between 8:00 a.m. and 10:00 a.m.

1. Complete a submittal log similar to the Concrete Data Sheet shown in Appendix A. A Microsoft Word electronic version of the Concrete Data Sheet template will be made available upon request.

C. Portland Cement:

1. Submit manufacturer's certificate of compliance with ASTM C150 and standard physical and chemical analysis.

D. Pozzolan:

1. Furnish with each shipment a certificate with test data showing compliance with ASTM C618.

E. Admixtures:

1. Submit 10-ounce sample of each product proposed for use in concrete mix if requested.
2. Submit with sample the manufacturer's test data showing performance of product in concrete as to air content, water reduction, retardation, and effect on concrete strength at various ages, for concrete temperatures ranging 50 degrees F to 90 degrees F.

F. Aggregates:

1. Submit for the Engineer's approval, two weeks in advance of the concrete work, a representative sample of each size of fine and coarse aggregate to be used. Size of each sample shall be not less than 50 pounds.

G. Bonding agents:

1. Submit the product information and the manufacturer's recommendations for the product application for the Engineer's approval prior to use.

## 1.4 PRODUCT DELIVERY AND STORAGE

- A. Ship cement in paper sacks or in bulk.
- B. Store cement, pozzolan, aggregates and admixtures so that they are protected against deterioration from any cause.
- C. Keep separate the several sizes of fine and coarse aggregate while in storage.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. All structural concrete shall have a minimum compressive strength of 3000 psi at 28 days.
- B. Portland Cement:
  - 1. Portland cement shall conform to ASTM C150, Type II, and shall not contain more than 0.60% by weight of alkalis (calculated as sodium oxide plus 0.658 potassium oxide). Tested and certified cement shall not be mixed with, nor contaminated by, any other cement.
- C. Pozzolan:
  - 1. Pozzolan for cement replacement shall conform to ASTM C618 Class N or Class F (fly ash) with the following exception:
    - a. Pozzolanic activity index with lime, at 7 days, shall be 1000 psi minimum. (Table 2, ASTM C618)
- D. Admixtures:
  - 1. Types:
    - a. Air entraining admixtures (AEA) shall conform to ASTM C260.
    - b. Water reducing admixtures and water reducing and retarding admixtures (WRA and WRRR) shall conform to ASTM C494, Type A and D.
    - c. Accelerating admixtures containing chlorides shall not be used.
  - 2. Preparation:
    - a. Prepare admixtures in solution, maintain at uniform strength as recommended by the manufacturer, batch accurately by means of a reliable mechanical dispenser and visible check gauge, and add to the batch in the mixing water.

3. Specified admixtures:
  - a. Contractor shall add approved admixtures to all concrete. If requested, the Contractor shall submit a sample for testing as specified in Article 1.3.
4. Costs:
  - a. Include cost for furnishing and adding air entraining agent or other specified admixture to the concrete in the Contractor's bid for the work, and no extra compensation will be allowed thereafter.
  - b. Payment for furnishing and adding admixtures ordered by the Engineer but not covered by these specifications will be made as extra work as provided in the General Conditions.
  - c. The Contractor shall pay the cost of any admixture damaged, wasted, or used in unspecified concrete.

E. Water:

1. Water for mixing and curing concrete, washing aggregates, and mixing mortar shall conform to the requirements of CSS 90 - 1.02.D.

F. Aggregates:

1. Fine Aggregate (100% passing 3/8" mesh)
  - a. Conform to ASTM C33 with the following exceptions:
    - 1) When tested in accordance with ASTM C136, fine aggregate shall conform to the following limits:

<u>Sieve Number</u>	<u>% by Weight Retained on Sieve</u>
4	0 – 6
8	5 – 22
16	10 – 27
30	15 – 28
50	15 – 27
100	12 – 20
200	0 – 7
Pan	0 – 3

- 2) Fineness modulus shall be not less than 2.50, nor more than 3.00.
  - 3) Specific gravity S.S.D. shall not be less than 2.60.
- b. Free water shall not vary more than 5% in consecutive batches.

- c. Fine aggregate conforming to CSS Section 90-3.03 is also acceptable.
- 2. Coarse Aggregate (No. 4 to 1")
  - a. Conform to ASTM C33 with the following exceptions:
    - 1) When tested in accordance with ASTM C136, coarse aggregate shall conform to following limits designated by the Engineer:

<u>Sieve Size</u>	<u>Percent by Weight Passing</u>	
	<u>Primary Aggregate Nominal Sizes</u>	
	<u>1" x #4</u>	<u>3/4" x #4</u>
1-1/2'	100	-
1"	88 – 100	100
3/4"	65 – 90	90 – 100
3/8'	15 – 35	15 – 40
No. 4	0 – 5	0 – 5

- 2) Cleanness Test: Samples from the batching bin shall have a cleanness value of not less than 75 (State of California, Division of Highways, Test Method No. Calif. 227).
  - b. Coarse aggregate (1" x No. 4) conforming to CSS Section 90-3.02 is acceptable for Location a. only. See Article 1.2 F - Concrete Mix.
- 3. Wetting of Aggregate:
  - a. Perform wetting of aggregate for cooling, or rewashing to provide clean aggregate, in advance of delivery into the batching plant bins. Material shall have uniform and stable moisture content as batched, and such that the variations in aggregate moisture will not cause variations in slump from batch to batch of more than 1/2 inch. Any added moisture shall be in accordance with the water cement ratio specified in the approved mix design.

G. Synthetic Fiber Reinforcing Material:

- 1. Reinforcing material shall be 100% virgin polypropylene fibrillated fibers containing no reprocessed olefin materials and specifically manufactured for use as concrete secondary reinforcement. Material shall conform to ASTM C1116, Type III, and Performance Level I, Toughness Index I<sub>5</sub>, as outlined in Section 21 (Note 17) of ASTM C1116.
- 2. Acceptable manufacturers:
  - a. Fibermesh Company, Vallejo, CA, (707) 642-7747
  - b. Or equal as approved by the Engineer.

H. Bond breaker: Non-staining type, providing positive bond prevention.

1. Manufacturers and products:
  - a. Williams Distributors, Inc., Seattle, WA; Williams Tilt-Up Compound
  - b. SCA Construction Supply Div., Superior Concrete Accessories, Franklin Park, IL; Silcoseal 77
  - c. Burke Co., San Mateo, CA; Burke Clean Lift Bond Breaker or Burke Tilt Free Bond Breaker
  - d. Or equal as approved by the Engineer.

I. Patching material:

1. Contain no chlorides or other chemicals causing steel corrosion.
2. Low pressure silica fume mortar, EMACO as manufactured by Master Builders, Co, or equal as approved by the Engineer

2.2 SPECIAL CONCRETE

- A. Concrete for curbs, gutters, sidewalks and driveways shall contain one pound of lamp black per cubic yard or its equivalent in approved liquid solution.
- B. Concrete encasement for electrical conduit shall contain one pound of red oxide per sack of cement.

2.3 BONDING AGENTS

- A. Two-component liquid epoxy designed for bonding fresh concrete to existing concrete.
- B. Approved products:
  1. MasterEmaco ADH 326, Master Builders
  2. Sikadur 32, Sika Corporation
  3. Or equal as approved by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATIONS PRIOR TO PLACING CONCRETE

- A. Remove standing water, mud, and debris from foundation surfaces.
- B. Clean reinforcement of loose mill and rust scale, mortar, oil, dirt and coatings that reduce bond.
- C. See Section 03 11 00 regarding treatment of forms.



- D. Approximately 30 minutes before concrete is placed, saturate wood forms and absorptive foundations with water.

### 3.2 BATCHING

#### A. General:

1. Provide and maintain means and equipment required to determine and control the relative amounts of the various materials, including water, cement, admixture, sand, and each individual size of coarse aggregate entering the concrete.
  - a. Proportion batches of concrete on the basis of integral sacks of cement unless the cement is weighed.
  - b. Determine amounts of sand and individual size of coarse aggregate entering each batch of concrete by weighing, and the water by either weighing or metering.
2. Deposit materials in the batch bins directly over the discharge gates. Coarse aggregate shall be deposited in the batch bins through effective rock ladders when the free drop exceeds four feet.
3. Construct, maintain and operate equipment for conveying batch materials from the weighing and batching hoppers so that there will be no spillage of the batched materials or overlapping of batches.
4. The Engineer may inspect the batching operations at any time.
5. The Engineer may reject any concrete that is produced by batching equipment or operations that do not meet the requirements of the specifications.
6. Contractor shall give the Engineer 24 hours advance notice when batching is to be done.
7. Provide sufficient trucks of adequate size to ensure continuous delivery of batched material. Each truck shall carry a delivery ticket showing the mix number, size of batch, and the time it was batched. The ticket shall show the reading of the revolution counter at the time the truck mixer was charged.

#### B. Weighing and metering equipment:

1. Weighing and metering equipment shall be sealed by the California State Division of Weights and Measures.
2. Construct and operate batching equipment so that when the entire plant is running the combined inaccuracies in feeding and measuring materials will not exceed 1 percent for water or cement and pozzolan, \_\_\_ percent for any size of aggregate, and 1-1/2 percent for the total aggregate in any batch.

- a. Equipment for convenient confirmation of the accuracy of measurement is required for each batch.
- b. Equipment for water measuring shall be such that leakage will not occur when the valves are closed.
3. Provide standard test weights and other auxiliary equipment required for checking the operating performance of each scale or meter and make periodic tests in the presence of the Engineer. Furnish the Engineer with results of check tests made, and make adjustments, repairs, or replacements as the Engineer may consider necessary to secure satisfactory performance.
4. Where the batching plant involves the use of storage bins and weighing hoppers, each weighing unit shall include a visible springless dial or equal suitable device as approved by the Engineer which will register the scale load at any stage of the weighing operation from zero to full capacity.
  - a. Construct weighing hoppers so as to permit the convenient removal of material in excess of prescribed tolerances.
  - b. Each dial and water-measuring device shall be in full view of the operator, and, if practicable, the weighing equipment shall be arranged so that the operator may conveniently observe the operation of the bin gates and also the materials discharged into the mixing hopper.
5. Interlocked equipment
  - a. Interlock batching equipment in automatic plants so that:
    - 1) A new weighing cycle cannot be started until all the batchers are completely emptied and the dispatcher discharger gates and valves are closed.
    - 2) The batcher discharge gate cannot be opened until the correct weights of the materials are in the batching hoppers and the scales in balance.
    - 3) The discharge gates cannot be closed until all materials are entirely discharged from the hopper and are back in balance.
  - b. Interlock water valve so that batcher discharge valve cannot be opened until the filling valve is closed.
  - c. Interlock admixture dispenser to operate with the water batcher.
6. Dispensers for air admixtures shall have sufficient capacity to measure at one time the full quantity of properly prepared solution required for each batch.
  - a. Unless these admixtures are added to premeasured water for the batch, their discharge into the batch shall be arranged to flow uniformly into the

water stream for the batch, from beginning to the end of its flow into the mixer.

- b. Air entraining agents and water reducing retarders shall not vary from the required dosage more than five (5) percent.

### 3.3 MIXING AND DELIVERING

A. Ready-mixed concrete shall be mixed and delivered to the site of the work by means of one of the following operations:

1. Central mixed concrete: Mix completely in a stationary mixer. Transport the mixed concrete to the point of delivery in truck agitators or truck mixers operating at agitating speed. Non-agitating hauling equipment will not be permitted.
2. Shrink-mixed concrete: Mix partially in a stationary mixer and complete the mixing in a truck mixer.
3. Transit-mixed concrete: Mix completely in a truck mixer.

B. Mixing shall be in accordance with the following requirements:

1. Mix concrete ingredients in batch mixers until homogeneous and of uniform consistency.
  - a. The mixing of each batch shall continue for not less than 1-1/2 minutes for concrete not containing pozzolan, and for not less than 2 minutes for concrete containing pozzolan along with all ingredients, except the full amount of water, in the mixer.
    - 1) Minimum mixing period specified is predicated on the manufacturer's recommended speed of rotation of the mixer and the introduction of the materials, including water, into the mixer in accordance with ACI Standard 304, paragraph 4.3.
  - b. District reserves the right to increase the mixing time when the charging and mixing operations fail to result in the required uniformity of composition and consistency within the batch, and from batch to batch.
  - c. Add water prior to, during, and following the mixer-charging operations. No additional water shall be added to the batch to preserve the required concrete consistency despite excessive over-mixing.
  - d. Reduce batch sizes for ready-mixed concrete as necessary to avoid excessive mixing, loss of slump, and standby time.

C. Mixers and agitators:

1. Mixers may be stationary mixers or truck mixers.

2. Each mixer and its operation shall be subject to the approval of the Engineer, and any mixer that at any time produces unsatisfactory results, in the opinion of the Engineer, shall be repaired promptly and satisfactorily or shall be replaced.
  3. Operate mixers and agitators within the limits of capacity and speed of rotation designated by the manufacturer of the equipment.
  4. Equip each mixer other than truck mixers with a satisfactory mechanically operated timing and signaling (or locking) and metering device for indicating and assuring the completion of the required mixing period and for counting the batches.
  5. Equip truck mixers with counters of the continuous-registering, non-resettable type which accurately measure the number of revolutions of the drum or blades. Mount counters where the Engineer may safely and conveniently inspect them from alongside the trucks.
- D. When shrink-mixed concrete is furnished, concrete that has been partially mixed at a central plant shall be transferred to a truck mixer and all requirements of transit-mixed concrete shall apply. No credit in the number of revolutions at mixing speed shall be allowed for partial mixing at a central plant.
- E. When transit-mixed concrete is furnished, each batch of concrete shall be mixed for not less than 70 nor more than 100 revolutions of the drum or blades. The mixing speed shall be at the rate of rotation designated by the equipment manufacturer.
1. Additional mixing shall be at the speed designated by the equipment manufacturer as agitating speed.
  2. All materials, including water, shall be in the mixer drum before starting the count of the number of revolutions of mixing.
  3. Mixing operations shall begin within 30 minutes after the cement has been intermingled with the aggregates.
- F. When a truck mixer or agitator is used for transporting concrete, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours or before the drum has completed 300 revolutions, whichever comes first, after introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.
1. The Engineer will consider waiving the above limitations if it can be demonstrated to his satisfaction that the concrete workability is such that it can be satisfactorily placed and finished without the addition of water.
  2. When truck mixer or agitator arrives at the job site, the concrete shall be observed for slump. If the slump exceeds that permitted in the specification, the concrete will be rejected. If the slump is less than specified, water may be added at this time, and at this time only, to obtain the slump permitted.

3. The Contractor will remain responsible for the concrete strength regardless of if above adjustments have been made.
- G. No rejected concrete, the defects of which have been subsequently corrected, shall be used in the work unless approval has been given by the Engineer.

### 3.4 CONVEYING

- A. The methods and equipment used for conveying or transporting concrete shall maintain the concrete's required composition and consistency without segregation or loss of slump.
1. Extensive shifting of the mass of fresh concrete by vibrating will not be permitted.
  2. Use elephant trunks or adjustable pipe if fall is more than 6 feet.
  3. Conveyor belts shall not segregate concrete or spill mortar.
  4. Concrete pumps shall be capable of pumping concrete without an increase in slump or decrease in aggregate size. Air slugger used with a concrete pump shall be as recommended by the pump manufacturer, and shall be kept to a minimum.
  5. Aluminum pipe for conveying concrete is prohibited.
  6. Chutes:
    - a. Use only for small isolated sections of the work with the permission of the Engineer.
    - b. Water to promote free flow of concrete in chutes will not be permitted.

### 3.5 PLACING

- A. General:
1. Place concrete in the presence of the Engineer.
  2. Concrete in each integral part shall be placed continuously. Contractor will not be permitted to commence work on any part unless his facilities and his forces on hand are sufficient to complete the placing and finishing of the concrete.
  3. Concrete shall not be deposited over reinforcement, conduit, or piping until the Engineer has inspected the placing and given permission to proceed.
  4. Place concrete while fresh before it has taken initial set. Concrete that has partially hardened shall not be retempered with additional water.

5. Place concrete in continuous, approximately horizontal layers; depths shall not exceed 24 inches. Build layers of concrete with square ends and level tops.
- B. Rain:
1. Do not place concrete in the rain unless the concrete is protected from the addition of extra water.
  2. Equipment and materials needed for rain protection shall be immediately available during concrete placement.
- C. Temperature:
1. General:
    - a. Fresh concrete when placed shall have a temperature of not more than 80 degrees F and not less than 50 degrees F.
  2. Cold weather concrete:
    - a. Protect newly placed concrete against freezing.
    - b. Remove ice, snow, and frost from placement area, before concrete is placed. Concrete shall not be placed on a frozen subgrade.
    - c. Provide all necessary materials and equipment for the protection of newly placed concrete.
    - d. When the mean daily temperature is predicted to drop below 40 degrees F, the concrete shall be maintained at a temperature above 50 degrees F for not less than 72 hours after it is placed. Protect formed concrete or slab surfaces with commercial insulating blankets not less than 1" in thickness.
- D. Foundations:
1. Concrete in foundations shall be placed on original and undisturbed material unless otherwise shown on the drawings or unless required excavation prevents utilization of such foundation.
  2. Provide and maintain pumping equipment to keep excavations free of water while concrete is being placed and for such time afterward to permit proper protection of the concrete during curing.
  3. Intercept and remove water so there will be no flow into or through the freshly placed concrete.

E. Monolithically Placed Concrete:

1. If concrete is placed monolithically around openings having vertical dimensions greater than two feet, or if concrete in decks, slabs, girders, and other similar parts of structures is placed monolithically with supporting concrete, the following instructions shall be followed:
  - a. Place concrete over openings and in decks, slabs, beams, girders, and other similar parts of structures with as low a slump as practicable. Special care shall be exercised to achieve thorough consolidation.
  - b. Delay placing concrete from one to three hours at the top of openings and the bottom of decks, slabs, beams, girders, and other similar parts of structures; placing shall not be delayed so long that vibrating unit will not readily penetrate, by its own weight, the concrete placed before the delay.
  - c. Place last two feet or more of supporting concrete with as low a slump as practicable. Exercise special care to achieve thorough consolidation.
  - d. Surfaces of concrete where delays are made shall be clean and free of loose and foreign material when concrete placing is resumed.

3.6 CONSOLIDATING

- A. Consolidate concrete by means of high frequency internal vibrators with operating speeds of not less than 7,000 vpm, except under water.
- B. Employ ample number of vibrators to consolidate the incoming concrete to the proper degree within five minutes after it is deposited.
  1. Number of vibrators will be predicated on the nature of the job and the ability to sufficiently consolidate the concrete within the specified time.
  2. In general, the number of vibrators available for use at the forms shall be as follows:
    - a. One vibrator for each five cubic yards of concrete placed per hour, and one standby vibrator for each three (or portion of three) vibrators in service.
    - b. Two vibrators in good working order shall be present at the forms.
- C. Provide a reliable source of power for vibrators.

3.7 JOINTS IN CONCRETE

- A. Joints in concrete work shall be made only where indicated on the drawings or where approved by the Engineer.

- B. Screeds shall be securely set for horizontal joints in concrete work, and for the tops of walls. See Section 03 35 00.
- C. When concrete is placed against previously hardened concrete, the interface shall be clean, free of laitance, and intentionally roughened to a full amplitude of approximately 1/4-inch.
- D. Where concrete has set, see Article 3.8.

### 3.8 BONDING FRESH CONCRETE TO EXISTING CONCRETE

- A. The following procedure shall be employed when bonding fresh concrete to existing concrete:
  - 1. All architectural finishes, such as cement plaster, shall be removed from the existing concrete surface area, exercising care not to excessively damage adjacent areas.
  - 2. The concrete surface shall be abrasive blasted to remove any sealant, paint, curing compound, or other coatings.
  - 3. Bonding agent shall then be applied to the cleaned concrete, following the manufacturer's recommendations, and the new concrete poured in place.

### 3.9 PACKING CONE HOLES AND REPAIRING CONCRETE IMPERFECTIONS

- A. After forms have been removed, make form tie holes watertight by roughening and moistening the surface and dry packing with a mixture of one part cement to three parts concrete sand.
  - 1. Resulting surface shall be finished to blend with the surrounding concrete.
  - 2. Cure repairs in accordance with Section 03 39 00.
- B. Repair rock pockets, honeycomb, mortar leaks, and other imperfections which require concrete or mortar replacement in accordance with Chapter VII of the Bureau of Reclamation Concrete Manual.
  - 1. Method and manner of making repairs shall be as approved by the Engineer and performed in his presence.
- C. Irregularities in concrete shall be repaired by bush hammering and grinding or building up as directed.
- D. Certain surface imperfections and irregularities may be left unrepaired when in the Engineer's judgment, they do not affect the structural integrity or soundness of the concrete and their repair would detract from the appearance of the structure.
- E. Use an approved bonding agent to assure a bond of the repair material to the old concrete. Apply according to the manufacturer's recommendation.



### 3.10 PACKING EQUIPMENT SUPPORT BASES

- A. Dry pack under the equipment support bases using a mortar mixture consisting of one part cement to three parts of concrete sand.
- B. Finish the resulting surface smooth at approximate one to one slope.
- C. Cure in accordance with Section 03 39 00.

### 3.11 FIELD QUALITY CONTROL

- A. Responsibility for testing: See Article 1.2.
- B. Compressive strength tests
  - 1. Provide such facilities and equipment as are necessary to procure and handle representative samples of concrete, and to safeguard test cylinders stored at the site of the work.
- C. Slump tests
  - 1. The slump determined by the Engineer in accordance with ASTM C143 at the point of placement shall not exceed the following:
    - a. Structures, flat slabs, and where not specified: 3 inches
    - b. Walls: 4 inches
  - 2. Tolerance
    - a. Slump tolerance shall be plus or minus 1/2-inch.

END OF SECTION

## SECTION 03 60 00

### GROUTING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. Section includes: Furnish and install grout and mortar as shown on the drawings and as specified herein. For steel pipe lining mortar, see Section 33 11 13.50, and for steel pipe coating mortar, see Section 33 11 13.60.

1. Cement grout
2. Cement mortar
3. Dry-pack mortar
4. Epoxy grout
5. Grout
6. Non-shrink epoxy grout
7. Non-shrink grout

B. Related sections:

1. Section 03 30 00 – Cast-In-Place Concrete
2. Section 33 12 01 – Basic Mechanical Materials and Methods

##### 1.2 REFERENCES

A. ASTM International (ASTM):

1. C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-inch or [50-millimeter] cube specimens)
2. C230 – Standard Specification for Flow Table for Use in Tests of Hydraulic Cement
3. C531 – Standard Test Method for Liner Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
4. C579 – Standard Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
5. C939 – Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)

6. C942 – Standard Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory
7. C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
8. C1181 – Standard Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts

### 1.3 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 00.
- B. Submit mix design and material sample of the following items to the Engineer for approval:
  1. Cement grout
  2. Cement mortar
- C. Submit manufacturer's literature and installation instructions of the following items to the Engineer 15 days prior to use:
  1. Non-shrink grout
  2. Non-shrink epoxy grout

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the jobsite in their original, unopened packages or containers, clearly labeled with the manufacturer's product identification and printed instructions.
- B. Store materials in a cool, dry place and in accordance with the manufacturer's recommendations.
- C. Handle materials in accordance with the manufacturer's instructions.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Non-shrink epoxy grout:
  1. Manufacturers: One of the following or equal as approved by the Engineer:
    - a. Five Star Products, Inc., Fairfield, CT, Five Star Epoxy Grout
    - b. BASF Construction Chemicals, Shakopee, MN, Masterflow 648 CP Plus
    - c. L&M Construction Chemicals, Inc., EPOGROUT

2. Non-shrink epoxy grout shall be a 100 percent solid, premeasured, prepackaged system containing a 2-component thermosetting epoxy resin and inert aggregate.
3. Maintain a flowable consistency for at least 45 minutes at 70 degrees Fahrenheit.
4. Shrinkage or expansion (less than 0.0006 inches/inch) when tested in accordance with ASTM C531.
5. Minimum compressive strength: 10,000 pounds per square inch at 24 hours and 14,000 pounds per square inch at 7 days when tested in accordance with ASTM C579, Method B.
6. Compressive creep: Not exceed 0.0027 inches/inch when tested under a 400 pounds per square inch constant load at 140 degrees Fahrenheit in accordance with ASTM C1181.
7. Coefficient of thermal expansion: Not exceed 0.000018 inches per inch per degree Fahrenheit when tested in accordance with ASTM C531, Method B.

B. Non-shrink grout:

1. Acceptable Products:
  - a. Five Star Grout, Five Star Products, Inc., Fairfield, CT
  - b. Masterflow 928, BASF Construction Chemicals, Shakopee, MN
  - c. CRYSTEX, L&M Construction Chemicals, Inc., Omaha, NE
  - d. Or equal as approved by the Engineer
2. In accordance with ASTM C1107
3. For grout used in areas in contact with potable drinking water, grout shall be NSF/ANSI 61 certified in accordance with California Code of Regulations Title 22, Section 64591.
4. Preportioned and prepackaged cement-based mixture:
  - a. Shall contain no metallic particles such as aluminum powder and no metallic aggregate such as iron filings
  - b. Shall require only the addition of potable water
5. Water for pre-soaking, mixing, and curing: Potable water.
6. Free from the emergence of mixing water from within or the presence of water on its surface.

7. Remain at a minimum flowable consistency for at least 45 minutes after mixing at 45 degrees Fahrenheit to 90 degrees Fahrenheit when tested in accordance with ASTM C230.
  - a. If at a fluid consistency, it shall be verified in accordance with ASTM C939.
8. Dimensional stability (height change):
  - a. In accordance with ASTM C1107, volume-adjusting Grade B or C at 45 degrees Fahrenheit to 90 degrees Fahrenheit
  - b. Have 90 percent or greater bearing area under bases
9. Have minimum compressive strengths at 45 degrees Fahrenheit to 90 degrees Fahrenheit in accordance with ASTM C1107 for various periods from the time of placement, including 5,000 pounds per square inch at 28 days when tested in accordance with ASTM C109 as modified by ASTM C1107

## 2.2 MIXES

### A. Cement grout:

1. Consists of concrete mix with coarse aggregate removed and water quantity adjusted as required
2. Use the same materials for cement grout that are used for concrete.
3. Use water-to-cementitious materials ratio that is no more than that specified for concrete being repaired.
4. For spreading over the surfaces of construction or cold joints: Mix with no more water used than allowed by water-to-cementitious materials ratio specified for concrete.

### B. Cement mortar:

1. Consists of concrete mix with coarse aggregate removed and water quantity adjusted as required
2. Use the same materials for cement mortar that are used for concrete.
3. Use water-to-cementitious materials ratio that is no more than that specified for concrete being repaired.
4. At exposed concrete surfaces not to be painted or submerged in water: Use sufficient white cement to make color of finished patch match that of surrounding concrete.

### C. Dry-pack mortar:

1. Mix in proportions by weight of 1 part portland cement to 2 parts of concrete sand.
    - a. Portland cement: As specified in Section 03 30 00 – Cast-in-Place Concrete
    - b. Concrete sand: As specified in Section 03 30 00 – Cast-in-Place Concrete
  2. Use only enough water so that resulting mortar will crumble to touch after being formed into ball by hand.
- D. Epoxy grout:
1. Consists of mixture of epoxy or epoxy gel and concrete sand
    - a. Epoxy: As specified in Section 03 63 01
    - b. Epoxy gel: As specified in Section 03 63 01
    - c. Sand: Clean, bagged, graded, and kiln dried silica sand
  2. Proportioning
    - a. For horizontal work: Consist of mixture of 1 part epoxy with not more than 2 parts sand
    - b. For vertical or overhead work: Consist of 1 part concrete epoxy gel with not more than 2 parts sand
- E. Grout:
1. Mix in proportions by weight of 1 part portland cement to 4 parts of concrete sand.
    - a. Portland cement: As specified in Section 03 30 00 – Cast-in-Place Concrete
    - b. Concrete sand: As specified in Section 03 30 00 – Cast-in-Place Concrete
- F. Non-shrink epoxy grout: Mix in accordance with manufacturer's installation instructions.
- G. Non-shrink grout: Mix in accordance with manufacturer's installation instructions such that resulting mix has flowable consistency and is suitable for placing by pouring.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Inspect concrete surfaces to receive grout or mortar and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations, and all loose material or foreign matter likely to reduce the bond or performance of grout or mortar.

### 3.2 PREPARATION

- A. Surface preparation:
  - 1. Remove grease, oil, dirt, curing compounds, laitance, and other deleterious materials that may affect bond from concrete and bottoms of baseplates.
  - 2. Roughen concrete surfaces by heavy sandblasting, waterblasting, chipping, or other mechanical means.
    - a. Remove loose or broken concrete.
  - 3. Metal surfaces: Sandblast to a 2 to 3 mil peak-to-valley profile.

### 3.3 PLACEMENT

- A. General:
  - 1. Use mortar mixer with moving paddles for mixing grouts. For cement grouts, pre-wet the mixer and empty out excess water before beginning mixing.
- B. Cement grout:
  - 1. Exercise particular care in placing cement grout since it is required to furnish structural strength, impermeable water seal, or both.
  - 2. Do not use cement grout that has not been placed within 30 minutes after mixing.
- C. Epoxy grouts:
  - 1. Use where indicated on the Drawings.
  - 2. Wet surfaces with epoxy for horizontal work or epoxy gel for vertical or overhead work prior to placing epoxy grout.
- D. Non-shrink grout:
  - 1. Add non-shrink cement grout to a premeasured amount of water that does not exceed the manufacturer's maximum recommended water content.
  - 2. Mix in accordance with manufacturer's instructions to uniform consistency.

3. May be drypacked, flowed, or pumped into place. Do not overwork grouts.
  4. Do not retemper grout by adding more water after stiffening.
- E. Non-shrink epoxy grout:
1. Mix in complete units. Do not vary the ratio of components or add solvent to change the consistency of the mix.
  2. Pour the hardener into the resin and mix for at least 1 minute and until mixture is uniform in color. Pour the epoxy into a mortar mixer wheelbarrow and add the aggregate. Mix until aggregate is uniformly wetted. Over-mixing will cause air entrapment in the mix.
  3. The temperature of non-shrink epoxy grout shall not exceed manufacturer's recommendations.
- F. Curing:
1. Cement based grouts:
    - a. Non-shrink grout: Cure in accordance with manufacturer's recommendations. Keep grout wet for a minimum of 7 days. Use wet burlap, a soaker hose, sun shading, ponding, and in extreme conditions, a combination of methods.
    - b. Maintain grout above 40 degrees Fahrenheit until it has attained a compressive strength of 3,000 pounds per square inch, or above 70 degrees Fahrenheit for a minimum of 24 hours to avoid damage from subsequent freezing.
- G. Epoxy based grouts:
1. Cure grouts in accordance with manufacturers' recommendations.
    - a. Do not wet cure epoxy grouts.
  2. Do not allow any surface in contact with epoxy grout to fall below 50 degrees Fahrenheit for a minimum of 48 hours after placement.
- H. Grouting equipment bases and baseplates:
1. General:
    - a. Grout with non-shrink grout as specified herein or non-shrink epoxy-grout as indicated on the drawings.
    - b. Comply with equipment manufacturer's installation instructions for grouting spaces, and tolerances for level and alignments, both vertical and horizontal.



- c. Grout after piping connections are complete and in alignment with no strain transmitted to equipment.
- d. Grout base when equipment is leveled and in alignment.
- e. Place grout, filling voids under equipment bases and other supports including recesses between anchor bolts and sleeves:
  - 1) All baseplate grouting shall take place from one side of a baseplate to the other in a continuous flow to avoid trapping air.
  - 2) Extend grout to edge of equipment bases or baseplates and bevel at 45 degrees around units.
  - 3) Grouts shall be cut back to the lower edge of baseplates after reaching initial set.
  - 4) Finish surfaces with slope that prevents ponding water within grouted areas.
  - 5) Hydrostatic head pressure shall be maintained by keeping the level of the grout in the headbox above the bottom of the baseplate. The headbox should be filled to the maximum level and the grout worked down.

2. Forms and headboxes:

- a. Build forms for grouts of material with adequate strength to withstand the placement of grouts.
- b. Forms shall be rigid and liquid-tight. Caulk cracks and joints with an elastomeric sealant. Line forms with polyethylene for easy grout release. Forms carefully wax with 2 coats of heavy-duty paste wax will also be acceptable.
- c. Forms shall be 4 to 6 inches higher than the baseplate on one side of the baseplate configuration when using head pressure for placement.

3. Non-shrink epoxy grout:

- a. Cut back epoxy grout after setting. Install epoxy grout with chamfer edges built into the formwork.

### 3.4 FIELD QUALITY CONTROL

- A. Non-shrink grout: Test for 24-hour compressive strength in accordance with ASTM C942.
- B. Non-shrink epoxy grout: Test for 24-hour compressive strength in accordance with ASTM C579, Method B.

END OF SECTION

## SECTION 05 05 26

### FLANGE BOLTING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: Furnish and install bolts, washers, and nuts for flanged connections and where shown on the drawings.
- B. All stainless steel fasteners are subject to additional material verification by the District at the District's expense. Nonconforming bolts shall be segregated, identified and replaced with conforming bolts. Nonconforming bolts may be subjected to additional independent laboratory analysis at the Contractor's expense.
- C. Related sections:
  - 1. Division 33 – Utilities

##### 1.2 REFERENCES

- A. American National Standards Institute (ANSI):
  - 1. ANSI B1.1 – Unified Inch Screw Threads (UN and UNR Thread Form)
  - 2. ANSI B16.1 – Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250
  - 3. ANSI B18.2.1 – Square and Hex Bolts and Screws, Inch Series
  - 4. ANSI B18.2.2 – Square and Hex Nuts, Inch Series
  - 5. ANSI B18.22.1 – Plain Washers
- B. ASTM International (ASTM):
  - 1. ASTM A193 – Specification for Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service
  - 2. ASTM A194 – Specification for Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
  - 3. ASTM A449 – Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
  - 4. ASTM A563 – Specification for Carbon and Alloy Steel Nuts

5. ASTM D2000 – Standard Classification System for Rubber Products in Automotive Applications
  6. ASTM F436 – Specification for Hardened Steel Washers
  7. ASTM F844 – Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
  8. ASTM F2329 – Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
- C. American Water Works Association (AWWA):
1. AWWA C207-13 – Steel Pipe Flanges for Waterworks Service, Sizes 4 In. Through 144 In. (100 mm through 3,600 mm)
- D. SAE International (SAE):
1. SAE J429 – Mechanical and Materials Requirements for Externally Threaded Fasteners
  2. SAE J995 – Mechanical and Material Requirements for Steel Nuts

### 1.3 SUBMITTALS

- A. Submit manufacturer's literature and application schedule for all bolting to demonstrate conformance with these specifications.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. All elastomers (e.g. EPDM) shall meet the requirements indicated in Section 33 12 01 – Basic Mechanical Materials and Methods.
- B. Standard bolting:

Carbon Steel	Bolts:	Plain or Galvanized: ASTM A449 Type 1 Plain Only: ASTM A193 Grade B7 or SAE J429 Grade 5.	
	Nuts:	1/4" to 1":	Plain or Galvanized: ASTM A563 Grade B, standard hexagonal flat nuts Plain Only: A194 Grade 2H or SAE J995 Grade 5, standard hexagonal flat nuts
		1-1/8" to 1-1/2":	ASTM A563 Grade B, heavy hexagonal flat nuts
	Washers:	Diameter 1-1/2" and smaller:	ASTM F436 Type 1
	Coating:	Hot-Dip Galvanized	ASTM F2329 for A449 bolts, A563 nuts and F436 washers
Stainless Steel, Standard	Bolts:	ASTM A193 Class 1, B8 (Type 304) or B8M (Type 316)	
	Nuts:	ASTM A194, Grade 8 (Type 304) or Grade 8M (Type 316), Standard Hex	
	Washers:	Type 304 or 316 to match bolts and nuts	
Stainless Steel, High Strength	Bolts:	ASTM A193 Class 2, B8 (Type 304) or B8N (Type 304N), Carbide solution treated and strain hardened.	
	Nuts:	1/4" to 1-1/2"	ASTM A194, Grade 1 standard hex or Grade 8-S1 (Type 304) Heavy Hex and Strain Hardened
	Washers:	Type 304 or 316 to match bolts and nuts	
<p>1. Refer to standard drawing 323-EA, 324-EA or 325-EA for the specific bolt grade that corresponds to the pipe pressure of the application.</p> <p>2. Refer to section 40 20 20 for the Mechanical Bolting Application Schedule that calls out stainless or galvanized dependent upon the location of the application.</p>			

## 2.2 CONSTRUCTION

Bolts	ANSI B18.2.1, standard hexagonal heads
Nuts	ANSI B18.2.2
Washers	ANSI B18.22.1 Type A, Narrow

## 2.3 BOLTING MATERIAL OTHER THAN STEEL

- A. Threading and dimensions shall conform to the requirements for steel heads and nuts.

B. Class 3 Fit ANSI B1.1

## 2.4 BOLT MARKING

A. Identification symbols shall be applied to each bolt head to identify the material and grade of each bolt. The bolt identification symbols shall be as follows:

1. Carbon Steel: Three radial lines, 120 degrees apart
2. Stainless Steel: B8 (type 304), B8M (type 316)

## 2.5 LENGTH OF BOLT

A. After assembly, the bolts shall extend a minimum distance of two threads beyond the nut. In addition, the bolt length shall be no longer than 1-inch beyond the nut and shall not interfere with any appurtenance or the operation of any device.

## 2.6 THREADS

A. Coarse thread series – Class 2 Fit ANSI B1.1

## 2.7 BOLT THREAD ANTI-SEIZE COMPOUND

A. Compound shall be food grade meeting NSF code H1 standards for incidental contact, and shall be designed to prevent rusting, seizure and galling of bolt threads.

B. Acceptable products:

1. Loctite Food Grade Anti-Seize
2. Saf-T-Eze, by Saf-T-Lok®
3. Or equal as approved by the Engineer

## 2.8 FLANGE GASKETS

A. Potable Water:

1. General Requirements: See Section 01 61 00, Article 1.1.E – Materials in Contact with Drinking Water. NSF-61 certified: required.
2. Potable Water Service Conditions: Suitable for chloraminated water and in accordance with Standard Drawings 323-EA – Steel Pipe Flanges, Low Pressure, 324-EA – Steel Pipe Flanges, High Pressure, and 325-EA – Steel Pipe Flanges, Extra-High Pressure.
3. Composition Gasket: PTFE with aluminosilicate or hollow glass microspheres, meeting the requirements of AWWA C207-13. Full-face type gaskets shall be used for flat-faced flange sets and ring-type gaskets that extend outward to the inside of the bolt hole circle shall be used for raised-face flange sets. Thickness as shown on the Standard Drawings listed above.

- a. At a minimum, gaskets shall be rated for 750 psig @ 0 deg F and 0 psig @ 400 deg F; shall meet ASTM F36 compressibility  $\geq 25\%$  and recovery  $\geq 25\%$ ; ASTM D1708 Tensile Stress  $\geq 2000$  psi; ASTM F38 creep relaxation  $\leq 40\%$ ; and an ASTM F586 design "m" factor  $\geq 2.0$ , and a design "y" factor  $\geq 1500$  psi for 1/16" and 1/8" thick gaskets.
  - 1) Acceptable products:
    - a) Garlock 3505 EPIX
    - b) Garlock 3505
    - c) Teadit TF1572 SAN
    - d) Or equal as approved by the Engineer.
4. Rubber Gasket: EPDM in accordance with Section 33 12 01 and ASTM D2000, Shore Type A 60 - 90 durometer, full-faced type. Rated for 175 psig and -40 – 275 deg F. Full-face type. Thickness as shown on the Standard Drawings listed above.
  - a. Acceptable products:
    - 1) Garlock 98206
    - 2) AmericanBiltrite AB-576
    - 3) American Toruseal
    - 4) Or equal as approved by the Engineer.
- B. Raw Water: Composition Gasket; Synthetic fibers with nitrile (Buna-N) binder 1/8-inch thick; suitable for water, hydrocarbons, oils, and gasoline; 400 deg F continuous operating temperature; 500 psi maximum pressure. NSF-61 certified. Full-face type gaskets shall be used for "low pressure" steel flat-faced flange sets and "high pressure" steel flanges mating to a valve or appurtenance with cast iron flanges, while ring-type gaskets, which extend outward from the ID to only the inside of the bolt circle, shall be used for raised-face flange sets and "high pressure" steel flange sets. "Low pressure" and "High pressure" are defined on drawings 323-EA - Steel Pipe Flanges, Low Pressure and 324-EA - Steel Pipe Flanges, High Pressure.
  1. Acceptable products:
    - a. Garlock "Multi-Swell" Style 3760-U
    - b. Or equal as approved by the Engineer

- C. All Chemical Services: Low torque type, non-metallic flat face meeting ANSI B16.1 (Class 150), PTFE molded to EPDM body, with dual concentric convex sealing rings molded in PTFE between center hole and bolt circle.
  - 1. Acceptable products:
    - a. Garlock Style 370
    - b. Proco 9013-ET
    - c. Harrington Plastics
    - d. Chemline, Asahi
    - e. Or equal as approved by the Engineer
- D. Air: PTFE with Aluminosilicate 1/8-inch thick; 500 deg F maximum temperature; 800 psi maximum pressure. NSF-61 certified.
  - 1. Acceptable Products:
    - a. Garlock 3505
    - b. Teadit TF1572 SAN
    - c. Or equal as approved by the Engineer

## 2.9 FLANGE INSULATION SETS

- A. General Requirements: See Section 01 61 00 Article 1.1.E – Materials in Contact with Drinking Water.
- B. Insulating Gasket: NSF-61 certified, 1/8" full face NEMA grade G10 glass reinforced epoxy retainer with minimum 750 volts/mil dielectric strength and minimum 65,000 psi compressive strength, EPDM sealing element on the retainer, 200 deg F (minimum) at rated pressure, with NEMA grade G10 insulating sleeves and washers, and stainless steel backup washers.
- C. Acceptable products:
  - 1. Advance Products & Systems, Inc., APS Voltaccept™ Trojan G-10
  - 2. GPT LineBacker® 61
  - 3. Lamons Isoguard
  - 4. Or equal as approved by the Engineer



## PART 3 - EXECUTION

### 3.1 FLANGE BOLTING PROCEDURES

- A. All flange bolt torque values shall be verified using a properly calibrated torque wrench. The Contractor shall provide the torque wrench certificate of calibration upon request. Refer to Drawings 323-EA, 324-EA, and 325-EA for torque procedure details. Install the appropriate gasket.
- B. Install washers under both bolt heads and nuts. Verify that the OD of the washers does not extend past the OD of the flange.
- C. Coat bolt threads with anti-seize compound.

END OF SECTION

## SECTION 09 91 00

### PAINTING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section includes:

1. Surface preparation and painting of all interior and exterior exposed items and surfaces throughout the Project, unless specifically indicated otherwise.
2. Refer to surface finish schedule.

###### B. Related sections:

1. Refer to various other sections for identification of shop primed items.

##### 1.2 SURFACES NOT PAINTED

###### A. Do not paint the following surfaces:

1. Inside surfaces of mechanical ductwork and shafts inside building
2. Conduits, pipes and ducts in electrical room, ups/security/communications room, and HVAC room
3. Resilient flooring and tile
4. Factory finished metal surfaces, including anodized or coated aluminum, porcelain, and baked enamel finishes on metal
5. Glass, stainless steel, and chrome
6. Plastic laminates
7. Exterior or interior concrete
8. Acoustical finished surfaces
9. Roofing and waterproofing

##### 1.3 REFERENCES

- A. ASTM International (ASTM) D16 – Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products
- B. SSPC: The Society of Protective Coatings (SSPC)

#### 1.4 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this Section.
- B. Exposed: Exposed items and surfaces are defined as those which may be seen while standing on any floor, the roof, or in any occupied space
- C. Exterior: On the outside; exposed to the outside air or weather, either directly or indirectly, including areas behind grilles

#### 1.5 SUBMITTALS

- A. Schedule: Submit a schedule listing each coat and manufacturer's product number for all finishing products. Provide all architectural paint products manufactured by the same manufacturer, unless otherwise indicated.
- B. Samples: Submit three samples 8 x 10 inch in size illustrating each color and texture for each surface finish scheduled, made from actual paint to be used.
- C. Submit manufacturer's application instructions.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing quality paint and finish products with five years experience. Unless otherwise noted, conform exactly to the written recommendations of the manufacturer of the products used for preparation, mixing, application, and finishing as though completely included herein.
- B. Applicator Qualifications: Company specializing in commercial painting and finishing with documented experience, and approved by product manufacturer.
- C. Regulatory Requirements:
  - 1. Conform to California Building Code, for flame/fuel/smoke rating requirements for finishes.
  - 2. Conform to California Air Resources Board and South Coast Air Quality Management District (SCAQMD) for air pollution control requirements.
- D. Field Samples: Provide field sample panels, 6 x 8 foot minimum size, illustrating coating color, texture, and finish. Field samples may be requested for any and all paint finishes. Locate where directed. Engineer may require one color adjustment of each field sample color on the wall at no cost to the District. Accepted samples may remain as part of the Work.
- E. Pre-Installation Meeting: Convene a pre-installation meeting before application of painting materials, to be attended by the paint supplier, painting applicator, Contractor, and Engineer to discuss application methods, substrate and preparation,

desired mil thicknesses, and other topics related to achieving the quality of finish desired.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptance. Remove immediately any item rejected by the Engineer.
- B. Container labeling shall include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.
- C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in well ventilated area, unless required otherwise by manufacturer's instructions.
- D. Take precautionary measures to prevent fire hazards and spontaneous combustion.

#### 1.8 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F (7 degrees C) for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings in rain, fog, mist, or snow; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.
- D. Provide lighting level of 80 ft-candles measured mid-height at substrate surface during application and inspection of the work.
- E. Mix materials in ventilated areas as directed. Remove all empty containers, waste and contaminated rags from premises at end of each work day.

#### 1.9 MAINTENANCE

- A. Extra Materials: Furnish five gallons of each color and type of paint used to District. Label each container with color and room locations, in addition to the manufacturer's label.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Paint numbers specified are products of Sherwin-Williams Co., unless otherwise indicated; equivalent products of Benjamin Moore, Dunn-Edwards, ICI, or Pratt & Lambert are also acceptable. Provide all products by the same manufacturer, unless otherwise indicated.
- B. Base the bid on providing up to 6 paint colors, with up to 3 deep tone colors, consisting of any combined mix of gloss enamel, satin enamel, eggshell enamel, or flat latex. Each wall surface, soffit, ceiling, or plane will consist of only one color or type paint, unless otherwise shown.

### 2.2 MATERIALS - GENERAL

- A. Paints:
  - 1. Quality: Use only pure, unadulterated, first quality materials. If manufacturer makes more than one quality of material, use only their best quality.
  - 2. Compatibility: Use primers and succeeding coats of any given system from the same manufacturer, that are compatible with one another and with the substrate, and which are approved by the manufacturer, unless specifically scheduled otherwise. No thinning, reducing, or changing of mix is permitted unless specifically indicated herein.
- B. Environmental Standards: For interior applications use paints and coatings that comply with Green Seal GS-11 and the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24) and the following chemical restrictions:
  - 1. Architectural paints, coatings, and primers applied to interior walls and ceilings: Do not exceed the VOC limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993.
    - a. Flat Paints and Coatings: 50 g/L
    - b. Non-Flat Paints and Coatings: 150 g/L
    - c. Primers and Undercoats: 200 g/L
  - 2. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: VOC not more than 250 g/L, established in Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 7, 1997.
  - 3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

4. Restricted Components: Paints and coatings shall not contain any of the following:
- a. Acrolein
  - b. Acrylonitrile
  - c. Antimony
  - d. Benzene
  - e. Butyl benzyl phthalate
  - f. Cadmium
  - g. Di (2-ethylhexyl) phthalate
  - h. Di-n-butyl phthalate
  - i. Di-n-octyl phthalate
  - j. 1,2-dichlorobenzene
  - k. Diethyl phthalate
  - l. Dimethyl phthalate
  - m. Ethylbenzene
  - n. Formaldehyde
  - o. Hexavalent chromium
  - p. Isophorone
  - q. Lead
  - r. Mercury
  - s. Methyl ethyl ketone
  - t. Methyl isobutyl ketone
  - u. Methylene chloride
  - v. Naphthalene
  - w. Toluene (methylbenzene)
  - x. 1,1,1-trichloroethane

- y. Vinyl chloride
- C. General Purpose Filler: Standard spackling compound or gypsum wallboard joint compound or latex patching compound; for patching plaster, gypsum wallboard, and wood surfaces to receive opaque paint finishes.
- D. Cementitious Filler: Nonshrink formulation; white portland cement with fine silicate aggregate, zinc-oxide pigment, and reinforcing chemical binder as approved.
- E. Accessory Materials: Paint thinners, turpentine, linseed oil, shellac, and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality, as recommended by each manufacturer for his respective product.
- F. Equipment: Provide scaffolding, staging, drop cloths, covers, brushes, rollers, and spraying and other equipment of type, grade, and size required for proper execution of the Work.

## 2.3 COLORS AND FINISHES

- A. Use only materials capable of achieving the finishes and colors specified and scheduled.
- B. If the Contractor chooses to use a manufacturer's materials other than those for which specific color selections are made, the Engineer will select matching colors from that manufacturer's full range of colors.
- C. Paint colors are intended to be correct for next-to-last coat. Final approved color selections will be close to, but may vary slightly from, samples indicated.
- D. Painting Doors and Frames:
  - 1. Paint doors and frames same color on both sides and edges, unless otherwise noted on the door schedule.
  - 2. Where doors are scheduled to be painted two colors, paint the edges to match the face toward which the door swings.
  - 3. Where frames are scheduled to be painted two colors, the joint between colors shall occur behind the edge of the door where the stop meets the frame.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - 1. Gypsum Wallboard: 12 percent
  - 2. Concrete: 12 percent
- D. Do not begin work until unsatisfactory conditions have been resolved.

### 3.2 PREPARATION

- A. General:
  - 1. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
  - 2. Correct minor defects and clean surfaces which affect work of this Section.
  - 3. Shellac and seal marks which may bleed through surface finishes.
- B. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- C. Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- D. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- E. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
- F. Shop Primed Steel Surfaces: Touch-up primed steel frame immediately after erection, including end of beam plates. Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
- G. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- H. Gypsum Board Surfaces: Latex fill minor defects. Spot prime defects after repair.



- I. Concrete Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

### 3.3 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfiguration. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- B. Neatly mask door and frame rating labels and equipment labels.

### 3.4 APPLICATION

- A. General: Apply paints and coatings by brush, roller, spray, or other applicators in accordance with manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied. Do not apply finishes to surfaces that are not dry.
  - 1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  - 2. Provide finish coats that are compatible with primers used.
  - 3. Apply each coat to uniform finish and mil thickness. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
  - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convactor covers, and similar components are in place. Extend coatings in these areas as required to maintain system integrity and provide desired protection.
  - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed equipment. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  - 8. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
  - 9. Sand lightly between each succeeding enamel or varnish coat.

- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method.
  2. Allow each coat to dry before next coat is applied, as recommended by manufacturer.
  3. If sanding is required to produce a smooth, even surface, sand between applications.
  4. Omit primer over metal surfaces that have been shop primed and touchup painted.
  5. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color and appearance. Ensure that edges, corners, crevices, welds, and exposed fasteners receive the same dry film thickness as flat surfaces.
- C. Finishing Mechanical and Electrical Equipment:
1. Paint shop primed equipment. Do not paint identification markings on mechanical or electrical equipment.
  2. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
  3. In occupied spaces, prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished. Such items are not required to be painted in mechanical rooms.
  4. Paint interior surfaces of air ducts, and convectors that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind louvers, grilles, and convectors to match louver face panels.
  5. Paint exposed conduit and electrical equipment occurring in finished areas.
  6. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

### 3.5 FIELD QUALITY CONTROL

- A. Site Tests: Provide testing of mil thickness of coatings and finishes. All field painting is subject to verification of mil thickness.

### 3.6 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered. Repair damage to other surfaces caused by work of this Section.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site. Remove empty paint containers from site.

### 3.7 SCHEDULE – EXTERIOR PAINT SYSTEMS

- A. All Exterior Materials: Refer to Section 09 96 57 – Mechanical and Electrical Coating Systems.

### 3.8 SCHEDULE – INTERIOR PAINT SYSTEMS

- A. Shop-Primed Metal
  - 1. Refer to Section 09 96 57 – Mechanical and Electrical Coating Systems.
- B. Steel Stairs and Pipe Railings:
  - 1. Refer to Section 09 96 57 – Mechanical and Electrical Coating Systems.
- C. Gypsum Board (Flat Latex):
  - 1. 1st Coat: PrepRite Classic Interior Latex Primer, B28W101
  - 2. 2nd Coat: Harmony Interior Latex Flat, zero-VOC, B5W951
  - 3. 3rd Coat: Harmony Interior Latex Flat, zero-VOC, B5W951
- D. Gypsum Board at Toilet, Janitor's, and Wet Areas (Semigloss Latex):
  - 1. 1st Coat: PrepRite Classic Interior Latex Primer, B28W101
  - 2. 2nd Coat: Harmony Interior Latex Semigloss, zero-VOC, B10W951
  - 3. 3rd Coat: Harmony Interior Latex Semigloss, zero-VOC, B10W951
- E. MDO Paneling at Monitor Areas (Flat Latex):
  - 1. 1st Coat: PrepRite Classic Interior Latex Primer, B28W101
  - 2. 2nd Coat: Harmony Interior Latex Flat, zero-VOC, B5W951
  - 3. 3rd Coat: Harmony Interior Latex Flat, zero-VOC, B5W951

END OF SECTION

SECTION 22 05 53.05  
PIPE IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Furnish and install piping identification markers for exposed piping as specified herein.
- B. Related sections:
  - 1. Section 01 91 13.10 – Asset Identification Tags
  - 2. Section 40 20 20 – Mechanical Piping

1.2 REFERENCES

- A. ANSI A13.1 – Scheme for the Identification of Piping Systems
- B. ANSI Z535.1 – Safety Color Code

1.3 SUBMITTALS

- A. Descriptive literature for markers: The literature and drawings shall contain the manufacturer's name, description, manufacturers' product data, and the full item number or designation.
- B. Piping marker table: A table listing each piping service with proposed marker type, lettering and colors.

PART 2 - PRODUCTS

2.1 PIPE MARKERS

- A. Type:
  - 1. Snap-around type: Factory-fabricated, cylindrically coiled, suitable for direct application to pipe without adhesive or banding.
    - a. Material shall be UV and chemical resistant plastic that is suitable for all-weather service with the minimum thickness specified in Table A.
    - b. Pipe markers shall completely encircle the pipe.

- c. The marker text and flow direction arrows shall repeat to allow viewing from multiple angles. Banding straps may be used when the pipe circumference is larger than the largest available marker width.

2. Self-adhesive type:

- a. Material shall be UV and chemical resistant vinyl film with factory applied adhesive backing.
- b. Minimum thickness shall be 0.004-inch.
- c. Shall include:
  - 1) Multiple axial-mounted text blocks to allow visibility from all likely viewing directions
  - 2) Tape with repeating flow arrows surrounding the entire pipe circumference

B. Application:

- 1. Pipe sizes 8-inch and smaller with plain exterior or any type of coating: Snap-around type only.
- 2. Pipe sizes 10-inch and larger with plain or epoxy coated exterior: Either snap-around type with corner holes and pipe banding straps, or self-adhesive type marker with pipe flow-arrow banding tape.
- 3. Pipe sizes 10-inch and larger with mortar-coated exterior: Snap-round type with corner mounting holes and pipe banding straps.

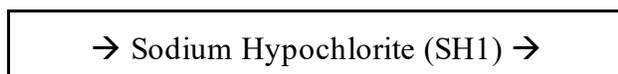
C. The required sizes of pipe labels shall be in accordance with ANSI A13.1, and based on diameter as follows:

<b>Table A</b>			
<b>Outside Diameter of Pipe or Jacketing</b>	<b>Length of Color Field</b>	<b>Minimum Thickness</b>	<b>Height of Letters</b>
3/4" to 1-1/4"	8"	0.020"	1/2"
1-1/2" to 2"	8"	0.020"	3/4"
2-1/2" to 6"	12"	0.030"	1-1/4"
8" to 10"	24"	0.020"	2-1/2"

<b>Table A</b>			
<b>Outside Diameter of Pipe or Jacketing</b>	<b>Length of Color Field</b>	<b>Minimum Thickness</b>	<b>Height of Letters</b>
Over 10"	32"	0.020"	3-1/2"

D. Label Format

1. Pipe Label Nomenclature: System label names, system codes, background colors and letter colors shall be per Drawings 9492-G-006 and -007 "Equipment Tag Number Codes & Colors". Colors shall conform to ANSI Z535.1, "Safety Color Code".
2. System Names and Codes: Labels shall contain the system name and the system code. If a number is assigned to a particular pipe on the related P&ID due to multiple pipes of the same system code, that number shall be included after the system code. Any abbreviations required to meet a character number limit shall be approved by the Engineer.
3. Flow Arrows: Same color as label lettering, or white on the same color background as the above. Flow arrows shall be placed pointing both to and away from the above labels in the direction of flow.
4. Example:



E. Acceptable products:

1. Snap-around type:
  - a. Seton: Setmark and Ultra-Mark
  - b. Brady: B-915 Bradysnap-On
  - c. Or equal as approved by the Engineer
2. Self-adhesive type:
  - a. Seton: Opti-code
  - b. Brady: B-946 Self Sticking Vinyl Marker Film
  - c. Or equal as approved by the Engineer.

## PART 3 - EXECUTION

### 3.1 PIPE MARKERS

- A. Pipe identification shall be applied at all points where:
  - 1. Piping leaves or enters a wall, conduit, partition or bulkhead, floor, ceiling, or underground areas
  - 2. At connections to equipment or instruments
  - 3. Adjacent to valves
  - 4. Adjacent to changes in direction and branches
  - 5. At approximately 20-foot intervals on pipe runs
- B. Pipe markers shall be applied after all installation, cleaning, and painting of the piping is completed.
- C. Pipe markers shall be applied to insulated and jacketed piping after the jacket installation is completed.
- D. For chemical pipes within a secondary containment pipe, the pipe marker shall be applied to the secondary containment pipe.
- E. Wherever pipes run parallel to other pipes or electrical conduits, the printed legend and other markings shall be applied in the same relative locations so as to be in either vertical or horizontal linearity, whichever the case may be.
- F. Where pipe markers must be placed some distance above or below the normal line of an operator's vision, the lettering should be placed below or above, respectively, the horizontal centerline of the pipe.
- G. When self-adhesive markers are used, multiple text blocks shall be installed to allow visibility from likely viewing directions.

END OF SECTION



## SECTION 26 05 00

### COMMON WORK RESULTS FOR ELECTRICAL

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

###### A. Section includes:

1. Division 26, Electrical covers the work necessary for the complete electrical system. Furnish materials, labor, and equipment in accordance with these Specifications and the accompanying Drawings.
2. The requirements of Division 26, Electrical in their entirety apply to all electrical work and equipment furnished on this project whether furnished or specified under this or other divisions of these Specifications.
3. See Division 1, General Requirements, which contain information and requirements that apply to the work specified herein and are mandatory for this project.
4. Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

##### 1.2 QUALITY ASSURANCE

- ###### A. Codes and Standards:
- The components covered by these Specifications shall be designed, tested, assembled, and installed in accordance with the minimum requirements of the latest published standards of the California Electric Code (CEC), National Electrical Safety Code (NESC), Underwriters Laboratory (UL), American National Standard Institute (ANSI), Institute of Electrical and Electronic Engineers, Inc. (IEEE), and the National Electrical Manufacturers Association (NEMA).

##### 1.3 SUBMITTALS

###### A. General:

1. Provide manufacturers' descriptive information and shop drawings for all equipment, material, and devices furnished under Division 26, Electrical including certified outline and arrangement drawings, schematic (elementary) diagrams, interconnection and connection diagrams. Device designations and symbols for schematic (elementary) connection or interconnection diagrams shall conform to the latest edition of NEMA ICS 1.

2. Submit complete interface schematic drawings for all equipment furnished in accordance with other Divisions (23, 27, 28, 33, 40, 43, etc.) that interface with electrical equipment. These drawings shall contain diagrams, terminal numbers, device names, tag numbers, control cable conductor colors and numbers, etc., to provide complete identification of the circuits and provide coordination between the equipment.
  3. Manufacturer's standardized elementary diagrams will not be acceptable unless applicable portions of the diagram have been clearly identified and non-applicable portions deleted or crossed out.
- B. Submit certified shop drawings and diagrams as follows:
1. Layouts indicating conformity with space requirements
  2. Assembly drawings in sufficient detail to identify every part of the specified equipment including bills of material
  3. General dimension, outline, and panel, cubicle, and structure layout drawings showing the principal dimensions of the equipment, the location of all devices therein, and the size of electrical conduits and connections
  4. One-line, three-line, schematic (elementary), connections detailing all internal wiring, and interconnection diagrams detailing all field wiring
  5. Control schematics shall use the ladder diagram type format incorporating line number, operation function statement, contact location line number with an underline for a normally closed contact, a description of operation of each device and complete step-by-step written sequence of operation. Wire and terminal numbers shall be clearly shown. Actual device symbols shall be used to represent equipment such as limit switches, level switches, pressure switches, time delay relays, etc. Control schematics shall be shown with the electrical system in a de-energized state. Refer to the schematic (elementary) diagrams in the contract drawings for examples. Refer to District's Standard Drawing 9492-G for device symbols.
  6. Complete interconnection diagram for each system showing every wire by number, every junction terminal box or device to which it connects from origination to final destination, and boxes, manholes, pull boxes, and cabinets through which it passes. These diagrams shall show wiring installed by Contractor between items of manufactured, prewired or non-prewired equipment.
  7. Furnish schematic (elementary) diagrams, including Contractor modifications, of all factory wired equipment and Contractor assembled or supplied equipment for Engineer's approval and record purposes. These wiring diagrams

shall indicate point-to-point wire terminations, and wire color identifications with tags per Section 26 05 19.

8. Characteristic curves for all protective devices.
9. Installation drawings for all electrical work showing conduit layout, conduit sizes and locations of equipment foundations, and details accurately dimensioned. Conduits located in foundation slabs or routed through concrete structures shall be indicated on the installation drawings and submitted for review prior to foundation concrete pour.

C. Seismic requirements:

1. Submit anchorage calculations for equipment that weighs 200 pounds or greater. Calculations shall be based on requirements of Section 33 12 01.
2. The following electrical equipment shall be designed and seismically anchored to resist Code prescribed seismic forces and shall not undergo loss of their intended function after application of these forces in accordance with Sections 01 43 11 and 01 81 02:
  - a. Generator Assemblies (Section 26 32 13)
  - b. Pad Mounted Transformers (Section 26 12 19)
  - c. Medium Voltage Switchgear (Section 26 13 23)
  - d. Switchboards (Section 26 24 13)
  - e. Motor Control Centers (Section 26 24 19)
  - f. Medium Voltage Variable Frequency Drives (Section 26 18 40)
  - g. Medium Voltage Motor Controllers (Section 26 18 39)
  - h. Raceway Systems (Section 26 05 33)
  - i. Lighting Systems (Section 26 51 13)
  - j. Cable Trays (Section 26 05 36)
  - k. Automatic Transfer Switches (Section 26 36 23)
  - l. Batteries (Section 26 33 13)
  - m. Low Voltage Distribution Transformers (Section 26 22 13)
  - n. Static Uninterruptible Power Supplies (Section 26 33 53)

- o. Low-Voltage Variable-Frequency Motor Controllers (Section 26 29 23)
- p. Panelboards (Section 26 24 16)

#### 1.4 RESPONSIBILITY

A. The Contractor shall be responsible for:

1. Complete systems functionally in accordance with the intent of these Contract Documents.
2. Coordinating the details of equipment layouts and construction for all Specification Divisions which affect the work covered under Division 26, ELECTRICAL.
3. Furnishing and installing all incidental items not actually shown or specified, but which are required by good practice to provide complete functional systems.
- 4.
5. Coordination with Division 33 – Utilities including but not limited to: mechanical systems packaged with electrical equipment, substations, transmission equipment, motor operated valves with integral controls, pump motors with motor protection controls, radio path survey and field instrumentation.

#### 1.5 INTENT OF DRAWINGS

- A. The Contract drawings indicate the extent, general location, and arrangement of equipment. Duct bank and conduit runs are diagrammatic and may not show the exact locations for installation. The Contractor shall verify the locations of conduit stub-ups based upon conduit entry space of equipment furnished from the manufacturer's certified shop drawings and by inspection of the actual equipment to be installed.
- B. In general, where the background on Drawings has been screened, the area screened is work other than electrical, unless otherwise noted. Work under Division 26 is shown heavier for contrast.
- C. Standard details are typical for all locations which apply regardless of whether a callout is shown on the plan or not.
- D. Electrical design is based on minimum horsepower and current ratings. If the manufacturer or Contractor provides equipment with a larger horsepower or current rating, the Contractor shall be responsible for making all necessary changes to accommodate the larger unit, with the approval of the Engineer. Contractor shall

pay for all such changes including engineering design by a Professional Electrical Engineer currently registered in the State of California.

- E. Number and size of wires which shall be installed in runs of conduit where not shown on the Drawings shall be determined from the one-line, schematics, connection, interconnection, and control diagrams of actual equipment furnished.

## 1.6 DEFINITIONS (APPLICABLE TO ELECTRICAL SPECIFICATIONS AND DRAWINGS)

- A. Certified: Confirmed to be accurate, or as represented, or as meeting standards.
- B. Concealed: Inside building above grade and located within walls, furred spaces, crawl spaces, attics, above suspended ceiling, etc. In general, any item not visible or directly accessible.
- C. Connect: Complete hookup of item with required services, including conduits, wires, and other accessories.
- D. Exposed: Either visible or subject to mechanical or weather damage, indoor or outdoor, include areas such as mechanical and storage rooms. In general any item that is directly accessible without removing walls, panels, ceilings or other parts of structure.
- E. Furnish: Supply and deliver complete.
- F. Install: Place, secure and connect as required to make fully operational.
- G. Provide: Furnish and install as defined above: perform work.
- H. Use (verb): Furnish and install as defined above.
- I. Wiring: Electrical conduit, raceway, conductors and connections.

## 1.7 NOT USED

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Unless otherwise indicated, provide all first-quality, new materials and equipment, free from any defects, in first-class condition, and suitable for the space provided. Provide UL listed materials and equipment wherever standards have been established by that agency.
- B. Where two or more units of the same class of material or equipment are required, provide products of a single manufacturer.

## 2.2 STANDARD PRODUCTS

- A. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturers' latest standard design that conforms to these Specifications.

## 2.3 EQUIPMENT FINISH

- A. Provide materials and equipment with manufacturers' standard finish system. Provide ANSI 61, light grey color for all equipment unless otherwise specified in the individual equipment sections. Provide two quarts of touchup paint.

## 2.4 ENVIRONMENTAL

- A. Provide materials and equipment suitable for installation and operation under rated conditions at 200 feet above sea level and with maximum ambient temperature of 104°F (40°C).
- B. Refer to Section 33 12 01 for additional information regarding environmental conditions and requirements.

## 2.5 OUTDOOR EQUIPMENT

- A. Provide equipment and devices to be installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 32°F to 104°F. Equipment must be capable of proper operation at rated output continuously in this ambient temperature range in direct sun. Provide any additional equipment such as enclosures, sunshades, and cooling equipment so that this performance requirement can be met.

## 2.6 FASTENERS

- A. Fasteners for securing equipment to walls and floors shall be either hot-dip galvanized after fabrication or stainless steel.

## 2.7 ENCLOSURES

### A. General

- 1. Equipment enclosures shall have NEMA ratings suitable for the location in which they are installed, as specified in this Section or as shown on the Drawings.
- B. Electrical enclosures shall have the following ratings:
  - 1. NEMA 1 for dry, non-process indoor locations shown on the Drawings.

2. NEMA 12 for locations shown on the Drawings.
  3. NEMA 4 for outdoor locations, rooms below grade (including basements and buried vaults) and locations shown on the Drawings.
  4. NEMA 4X for locations shown on the Drawings, typically in areas where corrosive materials are used and stored. Stainless steel NEMA 4X enclosures shall be used in corrosive areas located outdoors, whereas fiber glass NEMA 4X enclosures shall be utilized in corrosive areas located indoors.
- C. All electrical equipment located indoors within a corrosive area and designated on the Drawings as "NEMA 4X" shall be housed in an enclosure in conformance with the following specifications:
1. Boxes for panelboards, starters, disconnect switches, circuit breakers, control stations, auxiliary controls, etc., shall be manufactured of a high impact strength fiberglass-reinforced polyester material specifically designed for use in corrosive areas. The back and sides shall be of one piece construction. Doors or covers shall be attached with 316 stainless steel or non-metallic captive fasteners or hinge pins. The cover-to-box joint shall be made watertight with a mechanically retained gasket. All pushbutton operators, selector switches, handles, etc., mounted on the enclosure face shall be manufactured from fiberglass reinforced polyester or polycarbonate material with gasketing and rubber boots or cowlings. Boxes shall have interior components factory installed, wired, and tested and shall not be assembled at the jobsite.
  2. Acceptable Manufacturers:
    - a. Krydon as manufactured by Crouse Hinds
    - b. Rosite as manufactured by Allen Bradley
    - c. Or equal as approved by the Engineer.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Unless specified otherwise, electrical equipment and anchoring systems shall be designed to withstand seismic forces as specified in Section 01 43 11 and Section 01 81 02.
- B. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work which has a neat and finished appearance. Carry out work in accordance with NECA Standard of Installation unless otherwise specified.

- C. Coordinate electrical work with the Engineer and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the plant during construction.
- D. Check the approximate locations of light fixtures, electrical outlets, equipment, and other electrical system components shown on Drawings for conflicts with openings, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, notify the Engineer in writing. The Engineer's decision shall govern. Make modifications and changes required to correct conflicts.

### 3.2 PROTECTION DURING CONSTRUCTION

- A. Throughout this Contract, provide protection for materials and equipment against loss or damage in accordance with provisions elsewhere in these Contract Documents. Throughout this Contract, follow manufacturers' recommendations for storage. Protect everything from the effects of weather. Prior to installation, store items in clean, dry, indoor locations to prevent condensation. Energize all space heaters furnished with equipment or provide temporary heating, sufficient to prevent condensation, in transformers, switchgear, motors, motor control centers, and motor starters which do not have space heaters.
- B. Following installation, protect materials and equipment from corrosion, physical damage, and the effects of moisture on insulation. When equipment intended for indoor installation is installed at the Contractor's convenience in areas where it is subject to dampness, moisture, dirt, or other adverse atmosphere until completion of construction, ensure that adequate protection from these atmospheres is provided that is acceptable to the Engineer. Cap conduit runs during construction with manufactured seals. Keep openings in boxes or equipment closed during construction. Energize all space heaters furnished with equipment. Cap all spare conduits.

### 3.3 MATERIAL AND EQUIPMENT INSTALLATION

- A. Follow manufacturers' installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between the manufacturers' instructions, codes and regulations, and these Contract Documents, follow Engineer's decision. Keep copy of manufacturers' installation instructions on the jobsite available for review at all times.
- B. Use appropriate conduit and conductor entry fittings with enclosures which maintain the specified enclosure environmental capability after proper installation.

### 3.4 EQUIPMENT SUPPORTS

- A. Provide equipment supports for all equipment in accordance with Section 33 12 01 and per manufacturer's requirements. Free standing panels and enclosures shall be mounted on concrete pads that are of the same plan dimensions as the equipment



furnished unless otherwise shown on the drawings. Provide leveling channels under all equipment with roll out or drawout circuit breakers or contactors, located as recommended by the equipment manufacturer.

### 3.5 CUTTING AND PATCHING

- A. Lay out work carefully in advance. Do not cut, drill, or notch any structural member or building surface without specific approval of Engineer. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, paving, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical materials and equipment. Following such work, restore surfaces neatly to original condition. Use only skilled craftsmen of the trades.

### 3.6 CLEANING AND TOUCHUP PAINTING

- A. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove all materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish. If extensive damage is done to equipment paint surfaces, refinish the entire equipment in a manner that provides a finish equal to or better than the factory finish, that meets the requirements of the Specifications, and that is acceptable to the Engineer.
- B. The interior of all electrical equipment, including windings of dry type transformers, shall be vacuumed and wiped free of dust just before final acceptance. De-energization of equipment shall be at times approved in writing by the Engineer.
- C. Painting shall be in accordance with Section 09 91 00 – Painting. Unpainted boxes, cabinets, and raceways that are mounted on walls shall be painted to match adjacent finishes.

### 3.7 INSPECTION

- A. Allow materials, equipment, and workmanship to be inspected at any time by the Engineer and District or their representatives. Correct work, materials, or equipment not in accordance with these Contract Documents or found to be deficient or defective in a manner satisfactory to the Engineer.

### 3.8 STANDARDS, CODES, PERMITS, AND REGULATIONS

- A. Perform work; furnish, install, and test materials and equipment in full accordance with the latest applicable rules, regulations, requirements, and specifications of the following:
  - 1. Local Laws and Ordinances

2. State and Federal Laws
  3. State Fire Marshal
  4. Underwriters Laboratories (UL)
  5. National Electrical Safety Code (NESC)
  6. American National Standards Institute (ANSI)
  7. National Electrical Manufacturers Association (NEMA)
  8. National Electrical Contractors Association (NECA) Standard of Installation
  9. Institute of Electrical and Electronics Engineers (IEEE)
  10. Insulated Cable Engineers Association (ICEA)
  11. Occupational Safety and Health Administration (OSHA)
  12. National Electrical Testing Association (NETA)
  13. ASTM International (ASTM)
  14. California Electrical Code (CEC)
- B. Conflicts, if any, that may exist between the above items, will be resolved at the discretion of the Engineer.
- C. Wherever the requirements of the Specifications or Drawings exceed those of the above items, the requirements of the Specifications or Drawings govern. Code compliance is mandatory. Construe nothing in the Contract Documents as permitting work not in compliance with these codes.
- D. Obtain all permits and pay all fees required by any governmental agency or utility having jurisdiction over the work. Arrange all inspections required by these agencies. On completion of the work, furnish satisfactory evidence to the Engineer that the work is acceptable to the regulatory authorities having jurisdiction.

### 3.9 SERVICE CONTINUITY

- A. Maintain continuity of electric service to all functioning portions of the plant. Make no outages without prior written authorization of the Engineer. Include all costs for temporary wiring and overtime work required in the Contract price. Remove all temporary wiring at the completion of the work.

### 3.10 TEMPORARY ELECTRIC POWER

- A. Refer to Section 01 50 00 for necessary provisions for electric power used during construction.
- B. The Contractor shall provide temporary lighting for all trades within the buildings. The average lighting level (footcandle) shall meet OSHA and CAL-OSHA requirements.

### 3.11 TESTS

- A. Perform testing as specified in Sections 01 75 17.

END OF SECTION

## SECTION 26 05 19

### LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. Section includes:

1. Work necessary to provide a complete and operable low voltage cable system as specified herein.

B. Related sections: Refer to other divisions and sections of the contract documents to determine the extent and character of related electrical work specified elsewhere, but which shall be done under this section.

1. Section 01 14 00 – Work Restrictions
2. Section 01 31 19 – Project Meetings
3. Section 01 35 24 – Project Safety Requirements
4. Section 01 75 17 – Field Testing and Startup
5. Section 26 05 00 – Common Work Results for Electrical
6. Section 26 05 26 – Grounding and Bonding for Electrical Systems
7. Section 26 05 53 – Identification of Electrical Systems

##### 1.2 REFERENCES

A. Low-Voltage cables shall be installed in accordance with the latest editions and revisions of the following:

1. ASTM International (ASTM)
  - a. B3 – Standard Specification for Soft or Annealed Copper Wire
  - b. B8 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
  - c. B33 – Standard Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes
2. Insulated Cable Engineers Association (ICEA)

- a. S-73-532 – Standard for Control, Thermocouple Extension and Instrumentation Cables
- b. S-95-658 – Standard for Power Cables rated 2000 Volts or less for the Distribution of Electrical Energy
- 3. National Fire Protection Association (NFPA)
  - a. NFPA 70 – National Electrical Code
- 4. National Electrical Manufacturers Association (NEMA)
- 5. Underwriters Laboratory (UL)
  - a. Standard 44 – Thermoset Insulated Wires and Cables
  - b. Standard 83 – Thermoplastic Insulated Wires and Cables
  - c. Standard 1063 – Machine Tool Wires and Cables
  - d. Standard 1277 – Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members
  - e. Standard 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords

### 1.3 SUBMITTALS

- 1. Provide submittals in accordance Section 26 05 00 – Common Work Results for Electrical.
- 2. Provide a record of the maximum pulling tension for each cable pulled through an underground conduit duct bank.

### 1.4 QUALITY ASSURANCE

#### A. Electrical Safety

- 1. On-site personnel shall meet all project safety requirements specified in the Contract Documents.
- 2. Contractor personnel energizing equipment shall have documented and current training for the specific type of equipment that will be energized as required by the latest edition of NFPA 70E, Article 110.5. Reference also the general electrical safety-related work practice requirements in Section 01 35 24 – Project Safety Requirements.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Storage of cable after pulling or splicing shall include purging of entire cable with nitrogen or otherwise seal with tape at both ends.
- B. The Contractor shall inspect the reels as they are unloaded from the delivery truck. If the reel arrives on its side (one flange on the truck; the other in the air), notify the Engineer and the cable manufacturer before accepting shipment.
- C. Provide a crane, special lift truck or forklift to unload the cable reels.
- D. Cables shall be packaged on spools or reels. Each package shall contain only one continuous length of cable. Construct the packaging so as to prevent damage to the cable during shipping and handling.
- E. All conductor ends shall be sealed at the factory, and these seals shall be intact when the conductors are delivered.

## PART 2 - PRODUCTS

### 2.1 CONDUCTORS AND CABLES

- A. Provide cables as specified under the type number in this section (Type 1, Type 2, etc.). Conduits shown on the drawings have been sized to accommodate the outside diameter for each type.
- B. Type 11 (Power and control cables 600 Volts and less)
  - 1. Unless otherwise indicated, provide stranded copper conductors with size as indicated on the drawings.
  - 2. Provide the following types of insulation:
    - a. Type XHHW-2 insulation for conductors No.14 and larger having cross linked polyethylene insulation rated at 90 degrees C in wet and dry locations.
    - b. Insulation shall be self-lubricating for sizes #8 AWG and larger.
  - 3. Single conductor control wiring shall be No.14 AWG and shall have insulation type XHHW-2.
  - 4. Acceptable Manufacturers:
    - a. Southwire, SIMpull Type XHHW-2
    - b. Cerrowire, SLiPWire XHHW-2
    - c. Or equal as approved by the Engineer

C. Type 28 (VFD Cable 600V and Less)

1. For installation between VFD and motor
2. Three stranded XLPE insulated circuit conductors with one full sized insulated PVC ground
3. Jacket shall be oil resistant PVC type.
4. 100 percent overall shield and 85 percent braid coverage
5. Provide cable that is UL listed and conforms to the requirements of UL 1277 Type TC per CEC Article 336.
6. Acceptable Manufacturers:
  - a. Belden No. 29502
  - b. Or equal as approved by the Engineer

D. Multi-conductor Power, Control, and Instrumentation Cable 600 Volts and Less:

1. Provide cable that is UL listed and conforms to the requirements of UL 1277 and CEC Article 340, or UL listed Power Limited Circuit Cable that conforms to the requirements of Article 725 of the National Electrical Code. Provide cables permanently and legibly marked with the manufacturer's name, the nominal voltage, the type of cable, and the UL label (or submit evidence of UL listing).
2. Type 10 (600-Volt, Twisted, Shielded Pair or Triad Instrumentation Cable):
  - a. General: Type TC, single pair or triad instrumentation cable designed for noise rejection for process control, computer, or data log applications. Suitable for installation in conduit, cable tray, or other approved raceways. Minimum cable temperature rating shall be 90 degrees C dry locations, 75 degrees C wet locations.
  - b. Individual Conductors: No.18 AWG stranded bare soft annealed copper, Class B, 7-strand concentric per ASTM B8, size as indicated on the drawings; 7-strand tinned copper drain wire.
  - c. Insulation and Jacket: Each conductor 15-mil nominal PVC/nylon insulation. Pair conductors pigmented black and white; triad conductors pigmented black, white, and red. Jacket flame-retardant and sunlight- and oil-resistant PVC with 45 mil nominal thickness. Aluminum/polyester shield overlapped to provide 100 percent coverage.
    - 1) Acceptable Manufacturers:

- a) Belden No. 3088A (pairs);
  - b) Okonite Okoseal-N Type P-OS (triads)
  - c) Or equal as approved by the Engineer
3. Type 14 (600-Volt Individually Shielded Pairs with a Common Overall Shield Instrumentation Cable):
- 1) General: Type TC, twisted, shielded pairs of instrument cables, grouped in a single cable, designed for use for instrumentation, process control, and computer applications. Suitable for installation in conduit, wireway, or other approved raceways. Minimum cable temperature rating shall be 90 degrees C dry locations and 75 degrees C wet locations.
  - 2) Conductors: No. 18 stranded bare annealed copper, Class B, 7-strand, concentric per ASTM B8. Tinned copper drain wires sized as shown on the Drawings, one for each pair and one for the overall group.
  - 3) Insulation and Jacket: Each conductor 15-mil PVC and 4-mil nylon insulation. Pair conductors pigmented black and red or black and white, with red or white conductor numerically printed for group identification. Outer jacket flame-retardant and sunlight- and oil-resistant PVC with 45 mil minimum thickness. Individual pair shield aluminum/polyester. Group shield aluminum/polyester, overlapped for 100 percent coverage.
  - 4) Acceptable Manufacturers:
    - a) Belden No. 1048A (2 pairs), 1049A (4 pairs), 1050A (8 pairs)
    - b) Okonite Okoseal-N Type P-OS
    - c) Or equal as approved by the Engineer
4. Type 19 (600-Volt Multi-Conductor Control Cable):
- 1) General: UL listed, Type TC-ER, 600V multi-conductor copper control cable with Class B stranding per ASTM B8, #10 AWG unless noted otherwise on the drawings. Suitable for installation in conduit, cable tray, or other approved raceways. Minimum cable temperature rating of 90 degrees C for dry and wet locations.
  - 2) Insulation and jacket: Provide conductors having 30-mil ethylene-propylene rubber (EPR) insulation and 60-mil chlorinated polyethylene (CPE) jacket. Color-code the conductor group in accordance with ICEA S-61-402, Appendix K, Method 1, Table E-2.



- 3) Acceptable Manufacturers:
  - a) The Okonite Company, Okonite-FRM Okolon TS-CPE Type TC-ER Cable
  - b) Allied Wire and Cable, FR-EPR/CPE Unshielded Control Cable (E-2 Color Code)
  - c) Or equal as approved by the Engineer.

5. Type 27 (600-Volt, Individually Shielded Triads with a Common Overall Shield Instrumentation Cable):

- 1) General: Twisted, shielded triads of instrument cables, grouped in a single cable, designed for use for instrumentation, process control, and computer applications. Suitable for installation in conduit, wireway, or other approved raceways. Minimum cable temperature rating shall be 90 degrees C dry locations and 75 degrees C wet locations.
- 2) Conductors: No. 18 AWG stranded bare annealed copper, Class B, 7-strand, concentric per ASTM B8, size as indicated on the drawings. Tinned copper drain wires, one for each triad and one for the overall group.
- 3) Insulation and Jacket: Each conductor 15-mil PVC and 4-mil nylon insulation. Triad conductors pigmented black, red, and blue, or black, white, and red, with red or white conductor numerically printed for group identification. Outer jacket flame-retardant and sunlight- and oil-resistant PVC with 60 mil minimum thickness. Individual triad shield 1.35-mil aluminum/polyester. Group shield 2.35-mil aluminum/polyester, overlapped for 100 percent coverage.
- 4) Conductors shall be numerically printed for group identification.
- 5) Acceptable Manufacturers:
  - a) Belden No. 1094A (8 triads)
  - b) Okonite Okoseal-N Type P-OS(multiple triads)
  - c) Or equal as approved by the Engineer

E. Type 15 (RS-485):

1. General: Industrial low-capacitance shielded cables for EIA RS-485 applications, including security access card readers, suitable for outdoor use and installation in conduit and other approved raceways.

2. Conductors:
    - a. One (1) Pair of 22 AWG, 7x30 strand tinned copper
    - b. One (1) Conductor of 22 AWG, 7x30 strand tinned copper
  3. Conductor Insulation:
    - a. Pair(s) shall be insulated with foam high density polyethylene and color coded in White w/ Orange Stripe & Orange w/White Stripe.
    - b. Conductor(s) shall be insulated with Polyvinyl Chloride and color coded in Blue w/ White Stripe.
  4. Shield:
    - a. Pair(s) shall be individually shielded via aluminum foil polyester tape providing 100% coverage.
    - b. Overall shield shall be aluminum foil polyester tape providing 100% coverage and a tinned copper braid providing 65% percent coverage and, 7x30 strand tinned copper 22 AWG drain wire.
  5. Jacket: UV and oil resistant PVC, 0.300 inch overall nominal diameter, 300 volt, -20 degrees C to +60 degrees C operating temperature.
  6. Characteristic Impedance: 120 Ohms per pair
  7. Applicable Standards: CEC/UL CM and PLTC OIL RES II, UL 1685 Flame Test, UL 1581 Sunlight Resistance Test.
  8. Acceptable Manufacturers:
    - a. Belden No. 3106A (for one pair RS-485 applications)
    - b. Belden No. 3107A (for two pair RS-485 applications)
    - c. Or equal as approved by the Engineer
- F. Flexible Cord and Cable Sealing Fittings:
1. Provide liquid-tight strain relief connectors for exposed flexible cord and power cable where cables enter electrical panels and enclosures.
  2. Acceptable manufacturers:
    - a. OZ Gedney
    - b. Hubbell

- c. Appleton
- d. Or equal as approved by the Engineer

G. Electrical Tape for Color Coding:

1. Electrical tape shall be premium grade, not less than 7 mils thick, rated for 90 degree C minimum, flame-retardant, weather resistant, and available in suitable colors for color coding. The tape shall be resistant to abrasion, ultraviolet rays, moisture, alkalis, solvents, acids, and suitable for indoor and weather-protected outdoor use. The tape shall be suitable for use with PVC and polyethylene jacketed cables, and meet or exceed the requirements of UL 510.
2. Acceptable manufacturers:
  - a. 3M 35 Scotch Vinyl Electrical Tape for Color Coding
  - b. Plymouth Rubber Company Premium 37 Color Coding Tape
  - c. Or equal as approved by the Engineer

H. Low Voltage Splices, 600 volts and below:

1. General: Provide low voltage splices consisting of 600 volt compression type connectors and connector insulators, suitable for indoor and outdoor field installations.
2. Long Barrel compression connectors
  - a. Acceptable manufacturers:
    - 1) Burndy
    - 2) Thomas and Betts
    - 3) Panduit
    - 4) Or equal as approved by the Engineer
  - b. Provide two-way, un-insulated, compression connectors, long barrel type, suitable for use with stranded copper conductors. Provide UL listed connectors rated 600 volts minimum.
3. Connector Insulation
  - a. Connector insulators shall be cold shrink type factory expanded and assembled tubular EPDM rubber sleeves, suitable for field installation. Insulators shall shrink over in-line connections, forming a water-proof seal. Provide insulators rated for 1000 volts, minimum.

- b. Acceptable manufacturers:
  - 1) 3M
  - 2) Or equal as approved by the Engineer

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radius. Where pulling compound is used, use only UL listed compound compatible with the cable outer jacket, voltage rating, and with the raceway involved.
- B. Submit a schedule of cable pulls 2 weeks prior to installation.
- C. Monitor pulling tensions while pulling on runs between manholes and handholes and record the maximum tensions used. Advise the Engineer of cases exceeding the manufacturer's recommendations and remove and replace cables subjected to tensions in excess of those recommended.
- D. Perform pulling of cable in such a manner that the cable outer jacket does not scrape against the edge of the conduit, at both the inlet and outlet ends of the conduit. Cable shall be free of sandy or gritty material during pulling. If cable is laid on ground during pulling, cable shall be wiped free of sandy or gritty material prior to entry of cable into conduit and prior to application of any pulling compound.
- E. Tighten all screws and terminal bolts using torque type wrenches and/or drivers to tighten to the inch-pound requirements of the CEC and UL.
- F. Where single conductors and cables in manholes, handholes, vaults, and other indicated locations are not wrapped together by some other means such as arc and fireproofing tapes, bundle throughout their exposed length all conductors entering from each conduit with nylon, self-locking, releasable, cable ties placed at intervals not exceeding 18 inches on centers.
- G. Terminate no more than two control conductors per terminal point. Terminate all spare conductors on terminal blocks.
- H. Low voltage power and control conductors shall be in separate conduits.
- I. Only combine conductors with no more than two wire sizes difference to prevent possible installation damage to the smaller conductors; otherwise use separate conduits.

### 3.2 CONDUCTOR 600 VOLTS AND BELOW

- A. Provide conductor sizes indicated on drawings with no splices except as accepted in writing by the Engineer.
- B. Wire nuts may be used on 120-volt lighting and 120-volt receptacle circuits only. Place no more than one conductor in any single-barrel pressure connection. Use crimp connectors with tools by same manufacturer and/or UL listed for connectors of all stranded conductors.
- C. Soldered mechanical joints insulated with tape will not be acceptable.
- D. Color coding on wire sizes larger than No. 6 AWG shall be by taping the individual conductors with the appropriate colored self-adhesive vinyl electrical tape. Vinyl plastic insulating tape for wire and cable splices and terminations shall be flame retardant, 7-mil thick minimum, rated for 90 degrees C minimum meeting the requirements of UL 510.
- E. Provide terminals and connectors acceptable for the type of material used.
- F. Arrange wiring inside control panels, motor starters, switchgear, etc., neatly cut to proper length, remove surplus wire, and bridle and secure in an acceptable manner. Identify all circuits entering switchgear, motor starters, control panels, etc., in accordance with the cable schedules on the drawings. Terminate cable conductors on the same side of the terminal blocks as shown on the drawings.
- G. Terminate control and instrumentation wiring with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions. Where terminals provided will accept such lugs, terminate all control and instrumentation wiring with insulated, ring terminal compression lugs. Control panel incoming field wireway sizes indicated on the drawings are considered minimum. Contractor shall adjust wireway sizes to meet CEC percentage fill requirements.
- H. For control and instrumentation wire terminals designed to accept only bare wire compression terminations, use insulated wire ferrules on ends of wire. Tighten all terminal screws with torque screwdriver to recommended torque values.
- I. Attach compression lugs with a tool specifically designed for that purpose which provides a complete, controlled crimp where the tool will not release until the crimp is complete. Use of plier type crimpers is not acceptable.
- J. Cap spare conductors and conductors not terminated with UL listed end caps.
- K. Where conductors pass through holes or over edges in sheet metal, remove all burrs, chamfer all edges, and install bushings and protective strips of insulating material to protect the conductors.

- L. For conductors that will be connected by others, provide at least 6 feet spare conductor in freestanding panels and at least 2 feet spare in other assemblies. Provide additional spare conductor length in any particular assembly where it is obvious that more conductor length will be needed to reach the termination point.
- M. Train cables passing through manholes and handholes along the walls on cable racks. Allow 2 feet of slack in each run in a "drip loop" at least once along a wall. Loops and cables shall be organized, trained, and neatly installed.
- N. Do not strip cables more than eight inches from the nearest termination point of that cable.
- O. Bundle and label all spare pairs with the cable designation. Tag all individual pairs to enable identification of spare pairs when making future terminations.
- P. Splices will not be permitted except as accepted in writing by the Engineer.
- Q. Ends of cable shall not be exposed to environment more than 24 hours after pulling or splicing. After 24 hours, purge the cable with nitrogen and seal with tape.

### 3.3 MULTI-CONDUCTOR POWER, CONTROL, AND INSTRUMENTATION CABLES 600 VOLTS AND LESS

- A. Splices will not be permitted except as accepted in writing by the Engineer.
- B. Where connections of cables installed under this section are to be made under Div. 40, Process Integration, leave pigtails of adequate length for neat bundled type connections.
- C. Maintaining the integrity of shielding of instrumentation cables is essential to the operation of the control systems. Take special care in cable installation to ensure that grounds do not occur because of damage to the jacket over the shield. Shields shall be grounded at one location only as shown on the drawings.

### 3.4 CONDUCTOR COLOR CODING

- A. Color coding of multiconductor control and instrumentation cable is specified in the individual cable type specification.
- B. For power conductors, provide all single conductors and individual conductors of multiconductor power cables with integral insulation pigmentation of the designated colors, except conductors larger than No. 6 AWG may be provided with color coding by wrapping the conductor at each end and at all accessible locations with vinyl tape. Where this method of color coding is used, wrap at least six full overlapping turns of tape around the conductor covering an area 1-1/2 to 2 inches wide at a visible location at all conductor termination and pulling points.
- C. Phase A, B, C implies a positive sequence connection (i.e., counterclockwise electrical phasor rotation and clockwise motor rotation).

D. Use the following colors:

<u>System</u>	<u>Conductor</u>	<u>Color</u>
All Systems	Equipment Grounding	Green
240/120V 1-Phase, 3-Wire	Grounded Neutral Phase A Phase B	White Black Red
208Y/120 Volts, 3-Phase, 4-Wire	Grounded Neutral  Phase A Phase B Phase C	White  Black Red Blue
480Y/277 Volts, 3-Phase, 4-Wire	Grounded Neutral (if used)  Phase A Phase B Phase C	White, Black Tracer  Brown Orange Yellow
48V DC Positive		Red
48V DC Negative		Black
Single Conductor, AC		Red
Multiple Conductor Control Cables		ICEA Method 1 Table K-2
Multiple Conductor Power Cables		ICEA Method 1, Option D
Twisted shield pair	Positive Return	White Black
Twisted shield triad (for RTDs)	Positive Compensation Return	Red White Black
24V DC Positive		Blue
24V DC Negative		Gray
Single-Conductor, DC Alarm, Annunciator,		Purple

Instrumentation,  
and Telemetry  
(if not shielded)

- E. All conductors carrying AC foreign voltage over 100 VAC into control panels, switchboards, and other enclosures shall be yellow. Multi-conductor cables carrying such foreign voltage shall be marked with yellow tape at each termination point.

### 3.5 LACING OF WIRES AND CABLES

- A. Lace all wires and cables in pull or junction boxes, manholes, handholes, wireways, and at each termination. Lace wires and cables so that the wires of the individual circuits are laced together by circuit and the laced-together circuit or cable shall be tagged with the cable number. Bundle all wiring entering and exiting the control panels into groups. Bundle and lace power, lighting, control, alarm, annunciator, and instrumentation wiring as specified herein.

### 3.6 PRE-ENERGIZATION CHECKOUT

- A. Conduct a complete inspection of the cable installation, including checking that all installation all accessible connections for tightness and correct torque, visually checking insulators for cracks and supports for damages, verifying that all shipping and packing material has been removed, and that all relay, meter, instrumentation, and other accessory wiring is correct.
- B. Check that all raceways and conductors are identified and tagged in accordance with the contract drawings and the Contractor's approved interconnection diagrams. Do this before replacing all covers.
- C. Verify that all cable shields are bonded at the equipment endpoints.

### 3.7 ENERGIZATION

- A. Energizing of low-voltage cables shall comply with the requirements specified in Article 1.4 - Quality Assurance.
- B. There shall be no load on the Type 11 power cables while they are being energized. Turn off all downstream loads.
- C. Prior to energizing any circuit that supplies rotating machinery, measure the phase sequence and verify that it is correct.

END OF SECTION



## SECTION 26 05 26

### GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section includes:

1. Furnish all labor, materials, equipment and incidentals required and install a complete grounding system in strict accordance with Article 250 of the California Electrical Code (CEC), as shown on the drawings and as specified herein.
2. All raceways, conduits and ducts shall contain equipment grounding conductors. If a size is not shown on the drawings, size in accordance with the CEC. Minimum sizes shall be No. 12 AWG.
3. Provide ground test stations where shown on the drawings.

###### B. Related Sections

1. Section 01 14 00 – Work Restrictions
2. Section 01 75 17 – Field Testing and Startup
3. Section 26 05 00 – Common Work Results for Electrical
4. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
5. Section 26 05 33 – Raceways and Boxes for Electrical Systems
6. Section 26 05 53 – Identification of Electrical Systems

##### 1.2 REFERENCES

###### A. Grounding systems shall be designed, built, tested, and installed in accordance with the latest editions and revisions of the following:

1. ASTM International (ASTM)
  - a. B2 – Standard Specification for Medium-Hard Copper Wire
  - b. B187 – Standard Specification for Copper Bar, Bus Bar, Rod, and Shapes
  - c. B8 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

- d. B418-95a Type II – Standard Specification for Cast and Wrought Galvanic Zinc Anodes
- 2. California Code of Regulations (CCR)
  - a. Title 24, Part 3 – California Electrical Code (CEC), Article 250 (Grounding)
- 3. Institute of Electrical and Electronics Engineers (IEEE)
  - a. IEEE Std 80 – IEEE Guide for Safety in AC Substation Grounding
  - b. IEEE Std 837 – IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding
  - c. IEEE Std 142 – IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
- 4. Underwriters Laboratories (UL)
  - a. 467 – UL Standard for Grounding and Bonding Equipment
  - b. 224 – UL Standard for Extruded Insulating Tubing
- 5. Canadian Standards Association (CSA)
  - a. CAN/CSA-C22.3 No. 6-M91 – Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines
- 6. InterNational Electrical Testing Association (NETA)
  - a. ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
- 7. National Association of Corrosion Engineers (NACE)
  - a. RP0177 – Mitigation of Alternating Current & Lightning Effects on Metallic Structures and Corrosion Control Systems
- 8. National Electrical Contractors Association (NECA)
  - a. NECA 331, Standard for Building and Service Entrance Grounding and Bonding

### 1.3 SYSTEM DESCRIPTION

#### A. Design requirements

- 1. Equipment grounding conductor sizing

- a. Include a Type 11 insulated copper ground wire as specified in Section 26 05 19 in every power conduit or multi-conductor cable that supplies power to motors. If a size is not shown on the drawings, the ground wire shall be the same size as the power cable up to size 2 AWG. For cables larger than 2 AWG, the ground wire may be reduced to half the size of the power cable as long as 2 AWG is the smallest size selected when the ground cable is smaller than the power cable.

#### 1.4 SUBMITTALS

- A. Submittals shall be made in accordance with Section 26 05 00 – Common Work Results for Electrical. In addition to these requirements, provide the following:

1. Shop drawings

- a. As-built drawings of the grounding system installation.
- b. As-built drawings shall be dimensioned and include GPS reference points for each buried ground rod using California grid NAD83 northing/easting coordinates. Include all information necessary to locate buried and/or concealed grounding system infrastructure in the future.

#### 1.5 QUALITY ASSURANCE

- A. All grounding and bonding products shall be UL listed.
- B. All exothermically welded or compression-type terminal lugs for buried or embedded connections shall use materials qualified in accordance with IEEE 837.

#### 1.6 COMMISSIONING

- A. Commission the grounding system and equipment as specified in Section 01 75 17 – Field Testing and Startup.

#### 1.7 EXTRA MATERIALS

- A. Provide two complete grounding sets, each set with the following features:
  1. Three-phase, clear jacketed #1/0 AWG copper cable, with six-foot long phase leads and six-foot long ground lead.
  2. All three phase leads and the ground lead shall have bronze ball-stud clamps designed to attach to a 1” diameter grounding ball. Clamps shall have an eyescrew for hot stick operation and shall be drilled to accept a 5/8-11 UNC threaded ferrule on #1/0 AWG copper grounding cable.
  3. Provide an unshrouded copper cable ferrule with translucent shrink tubing for stress relief and inspection of cable strands between the ferrule and jacket.

4. Provide a storage bag for temporary grounding clamps and cable sets. Bag shall be made of yellow, vinyl-laminated, nylon cloth, with plywood bottom and metal skids on bottom of bag.
  5. Acceptable manufacturers:
    - a. Hubbell-Chance assembly part number G3C10606HCB1B1 with catalog number T6000865 grounding storage bag
    - b. Or equal as approved by the Engineer
- B. Provide one insulated “shotgun” style hot stick for installing temporary grounds with the following features:
1. Single-piece style, with operating mechanism that opens a hook to grasp a clamp eyescrew on temporary grounding clamps and retract it into the tool head. The operating mechanism shall have a thumb latch which must be depressed to release the hook. Complete with a factory-installed universal fitting on end opposite the clampstick head. Overall length shall be 6’-6”.
  2. Yellow vinyl-impregnated fabric storage bag.
  3. One box of 50 packets of silicone wipes for hot line tools.
    - a. Hubbell-Chance Grip-All Clampstick, catalog number C4030292A with P6436 storage bag and C4002568 box of silicone wipes
    - b. Or equal as approved by the Engineer
- C. Provide one high-voltage detection kit for use in applications for voltages from 240 VAC to 69kVAC. The voltage detector shall be a proximity type instrument, making it unnecessary to make physical contact with the equipment being tested. The voltage detector shall be battery powered, made of non-conductive materials, be suitable for use with a hot stick using a splined universal end fitting, be provided with an accessory adapter to allow use with shotgun-style hotsticks, and shall have both audible and visual indication of voltage.
1. Acceptable manufacturers:
    - a. Salisbury 4769 High Voltage 69kV Self-Testing Voltage Detector Kit
    - b. Or equal as approved by the Engineer

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Direct-buried, concrete encased, and exposed grounding conductors

1. Bare copper stranded conductors conforming to ASTM B2 (medium hard drawn) with Class B stranding, size as indicated on the drawings.
  2. Acceptable manufacturers:
    - a. Southwire
    - b. General Cable
    - c. Or equal as approved by the Engineer
- B. Ground rods
1. 3/4-in by 12-ft copper clad steel constructed in accordance with UL 467. The copper thickness shall be 10 mil minimum. Provide UL mark on ground rod.
  2. Acceptable manufacturers:
    - a. Eritech (Erico), part number 613412
    - b. Harger, part number 3412
    - c. Or equal as approved by the Engineer
- C. Conduit grounding bushings
1. Insulated, 150 degree Celsius, malleable iron type with a solderless set-screw lug.
  2. Acceptable manufacturers:
    - a. Appleton, GIB-L-BC Series with bronze lay-in-lug for copper conductors
    - b. Hubbell Electrical Products (Raco)
    - c. Or equal as approved by the Engineer
- D. Waterpipe ground clamps
1. Electroplated tinned bronze U-bolt style pipe clamp, sized as required for the pipe diameter and ground wire size specified.
  2. Acceptable manufacturers:
    - a. Harger
    - b. Blackburn (Thomas & Betts)
    - c. Or equal as approved by the Engineer
- E. Fence grounding:

1. Provide fence post and fabric grounding clamps, jumpers, and assemblies as shown on the drawings.
  2. Acceptable manufacturers:
    - a. Harger
    - b. Erico
    - c. Or equal as approved by the Engineer
- F. Grounding system connections:
1. Buried or inaccessible connections
    - a. Make buried or inaccessible grounding connections with exothermic welds. Molds, cartridge materials, and accessories shall be as recommended by the manufacturer of the molds for the items to be welded. Molds and powder shall be furnished by the same manufacturer. An acceptable alternative to exothermically welded connections is a compression radial swage connection.
    - b. Acceptable manufacturers:
      - 1) Exothermic welded connections
        - a) Erico (Cadmold)
        - b) Harger (Ultraweld)
        - c) Or equal as approved by the Engineer
      - 2) Compression radial swage connections
        - a) DMC Power
        - b) No substitutions
  2. Accessible connections to equipment or connections to structural steel
    - a. Make connections to equipment, structural steel, and other accessible connections using one- or two-hole welded copper lugs as required for the cable size specified. An acceptable alternative to exothermically welded connections is a compression radial swage connection.
    - b. Acceptable manufacturers:
      - 1) Exothermic welded connections
        - a) Erico (Cadmold)

- b) Harger (Ultraweld)
    - c) Or equal as approved by the Engineer
  - 2) Compression radial swage connections
    - a) DMC Power
    - b) No substitutions
- 3. Connections to reinforcing steel
  - a. Make mechanical connections to reinforcing steel using UL 467 listed irreversible crimp compression copper connectors with the “run” and “tap” sizes as required for the reinforcing steel and cable size, respectively, specified. Connectors shall be factory prefilled with moisture inhibiting compound.
  - b. Acceptable manufacturers:
    - 1) Burndy HYTAP, Type YGHP
    - 2) Thomas & Betts (Blackburn), Figure 6 Compression Ground Tap Connector
    - 3) Or equal as approved by the Engineer

G. Pre-cast concrete boxes for ground-rod installation

- 1. Provide where shown on the drawings. Provide H-20 traffic rated lids inscribed “Ground Rod” on the top.
- 2. Acceptable manufacturers:
  - a. Christy
  - b. Jensen Concrete Products
  - c. Or equal as approved by the Engineer

H. Ground test station (GTS)

- 1. Asset Name
  - a. XXX-EPS-GTS-XXX
- 2. Each GTS shall be an assembly consisting of the following components:
  - a. 1/4” thick solid copper ground bar with length and height of bar sized per the number of connections required. The bar shall include pre-drilled universal lug holes.

- b. 600V insulators
    - c. Wall mounting bracket and all necessary mounting hardware
  - 3. Acceptable manufacturers
    - a. Eritech (Erico), EGB Series
    - b. Storm Copper Components
    - c. Or equal as approved by the Engineer
- I. Fasteners
  - 1. Use silicon bronze alloy hardware for all grounding connections to structures or equipment.
  - 2. Acceptable manufacturers:
    - a. Burndy, “Durium” hardware
    - b. AFL Global, “Everdur” hardware
    - c. Or equal as approved by the Engineer
- J. Electrical joint inhibitor compound
  - 1. Used for all bolted grounding connections as a moisture and oxidizing seal.
  - 2. Acceptable manufacturers:
    - a. Sanchem Inc., NO-OX-ID (A-Special Electrical Grade)
    - b. Or equal as approved by the Engineer

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare and clean piping, rods, and conductors prior to exothermic welding in conformance with the specific requirements of the welding system.

### 3.2 INSTALLATION

#### A. General

- 1. Bond all steel building columns in new structures together and connect to the ground test station as shown on the drawings.
- 2. Metal conduits stubbed into power distribution equipment, control panels, or other enclosure shall be terminated with insulated grounding bushings and



bonded to the enclosure's ground bus. Size the bonding wire in accordance with the CEC, except that a minimum No. 12 AWG shall be used.

3. All equipment enclosures, motor and transformer frames, conduits systems, cable armor, exposed structural steel and all other equipment and materials required by the CEC to be grounded, shall be grounded and bonded in accordance with the CEC.
4. For manholes/pullboxes with ground test stations, connect the ground test station to the site ground grid with two connections.
5. Care shall be taken to ensure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.
6. Liquid tight flexible metal conduit shall have bonding jumpers. Bonding jumpers shall be external, run parallel (not spiraled) and fastened with Type 316 stainless steel tie wraps.
7. Run grounding electrode conductors in the building concrete slab/wall or in slab/wall-embedded PVC Schedule 40 conduits unless otherwise shown on the drawings. Stub-ups at ground test stations and conduit runs underneath structures out to the perimeter ground ring shall be in PVC Schedule 80 conduit.
8. Ground cable penetrations through building exterior walls shall enter within 3 feet below finish grade and shall be prepared with a water stop. Unless otherwise indicated, the water stop shall include filling the space between stands with solder and soldering a 12-inch copper disc over the cable.
9. Install equipment grounding conductors with all feeders and branch circuits. Each circuit shall have a dedicated equipment grounding conductor from source to load without splicing or "tee tapping" (e.g., three different receptacle circuits in a common home-run conduit back to a lighting panelboard shall have three separate equipment grounding conductors back to the lighting panelboard).

#### B. Substation grounding

1. Substation and related site grounding shall be installed as shown on the drawings. All grounding conductor sizes are shown on the drawings.
2. Structures: all structures shall have at least two connections to the station ground grid at diagonally opposite corners.
3. Disconnect switches: ground the operator mechanism and switch ground mat as shown on the Drawings.
4. Power transformers: provide a bare copper wire connection from the X0 terminal to either the neutral grounding resistor or the station ground grid for

solidly grounded applications. For transformer case grounds, provide two connections to the station ground grid at diagonally opposite corners.

5. Neutral grounding resistors: provide a bare copper wire connection to the station ground grid from the resistor. For neutral grounding resistor case grounds, provide one connection to the station ground grid.
6. Power circuit breakers: provide two connections to the station ground grid at diagonally opposite corners.
7. Carrier coupling capacitors and CCVTs: provide one connection from the combination ground terminal and case ground to the station ground grid.
8. Capacitors: provide two connections to the capacitor switchgear ground bus.
9. Steel conduit, junction boxes, and receptacles: provide one connection to the station ground grid.
10. Indoor switchgear, switchboards, and other distribution equipment: provide as shown on the drawings.
11. Meter and relay cabinets: provide one connection to the station ground grid.
12. Lighting and security poles: provide one connection to the station ground grid.
13. Fences: provide as shown on the drawings.
14. Pullboxes and manhole: provide two connections from the ground test station to the station ground grid. Connections to pullbox/manhole hardware are not required.
15. DC station battery system: DC power systems shall not be grounded.
16. Control cable: ground each end of control cable shields.

#### C. Ground connections

1. Ground transformer neutrals, UPS neutrals, and other separately derived sources to the nearest GTS. Size the grounding electrode conductor in accordance with the CEC unless otherwise specified on the drawings.
2. Ground all grounding type receptacles to the outlet boxes with a No. 12 THWN/THHN/MTW green conductor connected to the ground terminal of the receptacle and fastened to the outlet box by means of a grounding screw.
3. Ground medium voltage power cable metallic shielding at each end of the cable and at each splice. Maintain shield continuity around splices.
4. Single-point ground instrumentation cable shields at the signal ground bus at the control panel end of the circuit.

5. Mechanically connect grounding electrode conductors to the foundation reinforcing steel where shown on the drawings.
6. Seal exposed connections between different metals with electrical joint inhibitor compound. Clean and coat all buried connections with electrical joint inhibitor compound before backfilling.
7. Do not bury or embed bolted connections. For compression-type connectors, the tool for crimping shall emboss the die index number into the connector as the crimp is completed. Each compression-type connector shall have an inspection port for use in checking proper conductor insertion.
8. Molds used for exothermic welding shall be new. The number of welds made per mold shall not exceed the manufacturer's recommendations.
9. Pipeline coating shall be repaired as shown on the project drawings.

#### D. Ground rods

1. Drive grounding electrodes at locations shown on the drawings. Provide a ground rod inside every underground pullbox and manhole. If the manhole contains a medium-voltage cable splice or termination, provide a GTS. Connect the detectable pull tape wire (specified in Section 26 05 33) to the ground rod or, if provided, the GTS.
2. Bury ground rods to the depth shown on the drawings. Interconnect ground rods with the wire size shown on the drawings.

#### E. Grounding wires

1. Unless otherwise specified, provide continuous, unspliced equipment grounding conductors.
2. Lay all underground grounding conductors slack and, where exposed to mechanical injury, protect by pipes or other substantial guards. If guards are steel pipe, or other magnetic material, electrically connect conductors to both ends of the guard. Make connections as specified in this Section.
3. Where grounding conductors extend beyond the perimeter of the building to site structures, the grounding electrode system shall be continuous with no splices.

#### F. Fasteners

1. Clean the connector and conductor surfaces with a wire brush or emery cloth to a shiny, bright surface. For plated surfaces, use compatible solvent cleaning in order not to remove any portion of the plating.
2. Apply electrical joint inhibitor compound immediately after cleaning.

3. All fasteners shall engage a minimum of four full threads for electrical connections and equipment mounting.
  4. Coat all bolts with electrical joint inhibitor compound.
  5. Torque fasteners to equipment manufacturer's specifications. If not specified by the manufacturer, torque fasteners to NETA specifications.
- G. Wire identification
1. Tag and lace all wires in test stations, pull or junction boxes, vaults, at each termination. Wire identification text shall be as shown on the drawing. Reference Section 26 05 53 for identification products.

### 3.3 PRE-ENERGIZATION CHECKLIST

- A. All Phase 1 pre-energization commissioning shall be complete and the testing submittal approved by the Engineer prior to energization.
- B. Inspect the grounding and bonding system conductors and connections for tightness, proper installation, and proper application of electrical joint inhibitor compound.

END OF SECTION

## SECTION 26 05 33

### RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section includes:

1. The work necessary to furnish and install complete raceways and boxes for electrical systems

###### B. Related sections:

1. Section 09 91 00 – Painting
2. Section 26 05 00 – Common Work Results for Electrical
3. Section 26 05 53 – Identification for Electrical Systems

###### C. Related work specified elsewhere:

1. All concrete shall be as specified in Division 03, but the responsibility of furnishing and installing the materials shall be that of this Section.
2. All trenching and surface restoration shall be as specified in Divisions 31 and 32 but the responsibility of furnishing and installing the material shall be that of this Section.
3. Refer to Section 26 05 43 for additional requirements applicable to underground duct and raceway installations.
4. For trapeze and conduit supports using hangers, refer to Section 40 20 20 – Mechanical Piping.

##### 1.2 REFERENCES

###### A. Raceway and boxes for electrical systems shall be designed, built, tested, and installed in accordance with the latest edition and revisions of the following:

1. California Code of Regulations (CCR)
  - a. Title 24, Part 3 – California Electrical Code (CEC)
2. National Electrical Contractors Association (NECA)
  - a. ANSI/NECA 1, Standard Practices for Good Workmanship in Electrical Construction

- b. ANSI/NECA 101, Standard for installing Steel Conduits (Rigid,IMC, EMT)
  - c. ANSI/NECA 102, Standard for installing Aluminum Rigid Metal Conduit
3. National Electrical Manufacturers Association (NEMA)
- a. ANSI/NEMA C80.1 American National Standard for Electrical Rigid Steel Conduit (ERSC)
  - b. ANSI/NEMA FB-1, Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cables
  - c. RN 1, Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
  - d. TC 2, Polyvinyl-Chloride (PVC) Conduit
  - e. TC 3, Polyvinyl-Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing
4. Underwriters Laboratories (UL)
- a. UL 6 Electrical Rigid Metal Conduit
  - b. UL 360, Standard for Liquid –Tight Flexible Metal Conduit
  - c. UL 651, Standard for Schedule 40, 80, Type EB, and a Rigid PVC Conduit and Fittings

### 1.3 QUALITY ASSURANCE

- A. Seismic design requirements for conduit hangers and supports:
- 1. All raceway systems to be furnished under this Section shall be designed and constructed to meet the seismic requirements of Sections 01 43 11 – Seismic Qualification and Certification and 01 81 02 – Seismic Design Criteria.
- B. The Contractor shall require that all persons engaged in the installation of PVC coated rigid steel conduit, elbows, nipples, and fittings attend installation training classes given by the approved manufacturer at the job site before any conduit installation work begins. The classes shall be carried out by technically competent and experienced instructors who are certified manufacturer's employees and instructors acceptable to the Engineer. The Contractor shall notify the Engineer two weeks in advance of the scheduled classes.
- C. The Contractor shall demonstrate to the Engineer that the approved manufacturer's recommended installation tools and methods are being utilized on the job site by all persons engaged in the installation of PVC coated rigid steel conduit, elbows,

nipples, and fittings. These tools and methods shall include, but not be limited to, clamp inserts for use on power driven units of chain vises, new die heads and enlarged pipe guides in conduit threading machines, and strap wrenches and extra wide wrench jaws for use in conduit assembly.

#### 1.4 SUBMITTALS

- A. Make submittals in accordance with Section 26 05 00 – Common Work Results for Electrical.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

##### A. Rigid Steel Conduit

1. Hot-dipped galvanized rigid steel conduit, including threaded type couplings, elbows, nipples, and other fittings, shall meet the requirements of ANSI C80.1, UL-6 and the CEC. Do not use setscrew or threadless type couplings, bushings, elbows, nipples, and other fittings, except when approved in writing by the Engineer.
2. Acceptable manufacturers:
  - a. Allied Tube and Conduit
  - b. Western Tube and Conduit
  - c. Or equal as approved by the Engineer

##### B. PVC Schedule 40 and Schedule 80 Conduits

1. PVC conduit shall be Schedule 40 or Schedule 80 as designated on the drawings, UL listed for concrete encased, underground direct burial, concealed and direct-sunlight-exposed use, and UL listed and marked for use with conductors having 90 degree C insulation. Conduits, couplings, elbows, nipples, and other fittings shall meet the requirements of NEMA TC 2 AND TC 3, Federal Specification W-C-1094, UL, CEC, and ASTM specified tests for the intended use. Use only conduit with a factory formed bell on one end. Conduit that requires the use of couplings for straight runs will not be acceptable.
2. Acceptable manufacturers:
  - a. Carlon Plus 40 or Plus 80 Rigid PVC Nonmetallic Conduit
  - b. JM Eagle
  - c. Or equal as approved by the Engineer

C. PVC-coated rigid steel conduit

1. PVC-coated rigid steel conduit shall be hot-dipped galvanized rigid steel conduit meeting the requirements of NEMA RN 1, ETL PVC-001, UL and the CEC. Conduit shall have a factory installed PVC coating 40 mils nominal thickness, and applied over and permanently bonded to the galvanized surface, with an interior 2 mil urethane coating. All male threads on conduit, elbows, and nipples shall be protected by an application of a urethane coating. Couplings, elbows, nipples and other fittings shall be threaded and galvanized and shall have integral plastic sleeves which overlap the plastic-coated conduit with pressure sealing sleeves. Use PVC coated conduit suitable for conductors with 75 degrees C insulation.
2. Acceptable manufacturers:
  - a. Robroy Plasti-Bond Red
  - b. Perma-Cote Industries Supreme Conduit System
  - c. Or equal as approved by the Engineer

D. Flexible Metal Conduit, Liquid-Tight

1. Flexible metal conduit shall be UL listed, liquid-tight, consisting of galvanized steel flexible conduit covered with an extruded gray PVC jacket and terminated with nylon bushings or bushings with steel or malleable iron body and insulated throat and sealing O-ring.
2. Acceptable manufacturers:
  - a. Anaconda Sealtite Type UA
  - b. Electri-Flex Liguatite Type LA
  - c. Or equal as approved by the Engineer

E. Pulling Tape – pulling conductors into conduits

1. Flat, woven, polyester tape used for installing fiber optic, copper, and coaxial cables in underground conduit. Tape shall have the following characteristics:
  - a. Lubricated for easy installation and reduced friction
  - b. Printed with sequential footage markings
  - c. 2,500 pound tensile strength
2. Acceptable manufacturers:



- a. NEPTCO, Polyester MULETAPE, WP Series
  - b. Or equal as approved by the Engineer
- F. Pulling Tape – empty spare conduits
- 1. Flat, woven, polyester tape with insulated 22 gauge conductor metallic conductor to enable detection of empty, spare conduits. Tape shall have the following characteristics:
    - a. Lubricated for easy installation and reduced friction.
    - b. Printed with sequential footage markings.
    - c. 2,500 pound tensile strengths.
  - 2. Acceptable manufacturers:
    - a. NEPTCO, Detectable MULETAPE, DT Series
    - b. Or equal as approved by the Engineer
- G. Raceway Fittings
- 1. Fittings for Rigid Steel:
    - a. Watertight hubs for rigid steel conduit shall be male thread type zinc-plated malleable iron with recessed "O" ring seal, insulated throat, and locking screw.
      - 1) Acceptable manufacturers:
        - a) OZ Gedney, Type CHM-T
        - b) Cooper Crouse-Hinds, Raintight Malleable Iron “MHUB”
        - c) Or equal as approved by the Engineer
    - b. Provide all malleable iron conduit bodies and covers with captive stainless steel screws and neoprene gaskets.
      - 1) Acceptable manufacturers:
        - a) Appleton, Form 35 Threaded Unilets
        - b) Killark, Duraloy 5 Series Malleable Iron
        - c) Or equal as approved by the Engineer

- c. Provide EYS and EZS conduit sealing fittings for use in Class I, Division I and Division 2 locations shown on the Drawings. Provide with Chico sealing compound.
  - 1) Acceptable manufacturers:
    - a) Emerson/Appleton
    - b) Cooper Crouse-Hinds
    - c) Or equal as approved by the Engineer
- 2. Fittings for Liquid-Tight Flexible Metal Conduit:
  - a. Straight, 45 degree angle, or 90 degree angle connectors with malleable iron gland nut, polyethylene compression ring, steel ferrule, malleable iron conduit assembly with insulated throat, steel lock nut, and copper grounding lug.
    - 1) Acceptable manufacturers:
      - a) Cooper Crouse-Hinds, Liquidator Series
      - b) Steel Electric Products
      - c) Or equal as approved by the Engineer
- 3. Fittings for PVC-Coated Rigid Steel Conduit:
  - a. Watertight and corrosion resistant hubs for PVC Coated Rigid Steel conduit shall have a minimum 40 mil PVC exterior coating, a urethane interior coating, and pressure sealing sleeves.
    - 1) Acceptable Manufacturers:
      - a) Robroy Plasti-Bond Red Type ST Hub
      - b) Perma-Cote Industries Supreme Type ST Hub
      - c) Or equal as approved by the Engineer
  - b. For corrosion resistant conduit bodies for use with PVC Coated Rigid Steel conduit sized as required by the CEC, use cast iron conduit bodies and covers with captive stainless steel screws, a 40 mil minimum PVC exterior coating and nominal 2 mil internal urethane coating, and pressure sealing sleeves on all conduit openings.
    - 1) Acceptable manufacturers:
      - a) Robroy Plasti-Bond Red Conduit Bodies

- b) Perma-Cote Industries Supreme Conduit Bodies
  - c) Or equal as approved by the Engineer
- c. In NEMA 4X areas, provide zinc-plated malleable iron or galvanized steel insulated throat connectors for liquid-tight flexible metal conduit, suitable for use in wet locations, with a minimum 40 mil PVC exterior coating and pressure sealing sleeves.
- 1) Acceptable manufacturers:
    - a) Robroy Plasti-Bond Red Liquid Tight Connectors
    - b) Perma-Cote Industries Supreme Liquidtight Connectors
    - c) Or equal as approved by the Engineer

#### H. Expansion/Deflection Couplings

- 1. Provide expansion/deflection couplings for use where shown on the Drawings and wherever conduit crosses an expansion joint. The couplings shall alleviate longitudinal, angular, and shear conduit stress caused by differential settlement.
- 2. Acceptable manufacturers:
  - a. Appleton/O-Z Gedney Type DX
  - b. Cooper/Crouse-Hinds Type XD
  - c. Or equal as approved by the Engineer

#### I. Expansion Couplings

- 1. Provide expansion couplings for use where shown on the Drawings. The couplings shall allow for expansion and contraction up to a maximum of 8" (4" in either direction) in a run of rigid metal conduit.
- 2. Acceptable Manufacturers:
  - a. Appleton/O-Z Gedney Type AX-8
  - b. Cooper/Crouse-Hinds Type XJG
  - c. Or equal as approved by the Engineer

#### J. Supports and Fittings

- 1. For areas not designated as NEMA 4X on the drawings, supports and fittings for support systems for electrical equipment and raceways shall be channel

supports sized to meet seismic requirements. Finish shall be hot-dipped galvanized steel for strut, pipe straps, clamp back spacers, hanger rod, strut nuts, U-bolts, beam clamps, and other supports and fittings.

a. Acceptable manufacturers:

- 1) Unistrut, B-Line
- 2) Power Strut
- 3) Or equal as approved by the Engineer

2. For areas designated as NEMA 4X on the drawings; supports and fittings for support systems for electrical equipment and raceways shall be channel supports sized to meet seismic requirements. Materials of construction shall be 40 mil PVC coated hot-dipped stainless steel, or self-extinguishing fiberglass which meets UL-94V-0 flammability tests, for strut, pipe straps, clamp back spacers, hanger rod, strut nuts, U-bolts, beam clamps, and other supports and fittings.

a. Acceptable Manufacturers:

- 1) Robroy Plastibond-Red PVC Coated Steel Strut and accessories
- 2) Fiberglass Strut and accessories
- 3) Perma-Cote Supreme PVC Coated Steel Channel and accessories
- 4) Or equal as approved by the Engineer

#### K. Wireways

1. For areas designated NEMA 1 or NEMA 12 on the Drawings, provide UL listed, hinged cover, NEMA 12 wireway bodies and covers fabricated from 16 gauge steel minimum, with an enamel or epoxy finish.

a. Acceptable Manufacturers:

- 1) Square D Square-Duct Wireway
- 2) Hoffman
- 3) Or equal as approved by the Engineer

2. For all other areas or where NEMA 3R, NEMA 4, or NEMA 4X is shown on the drawings, provide UL listed, raintight, hinged cover NEMA 4X wireway bodies and covers fabricated from stainless steel.

a. Acceptable Manufacturers:

- 1) Square D
- 2) Hoffman
- 3) Or equal as approved by the Engineer

L. Boxes and Fittings

1. Pressed steel switch and outlet boxes shall be hot-dipped galvanized.
  - a. Acceptable Manufacturers:
    - 1) Raco Manufacturing Co.
    - 2) OZ Gedney
    - 3) Or equal as approved by the Engineer
2. NEMA 12 terminal boxes, junction boxes, pull boxes, etc., shall be sheet steel unless otherwise shown on the drawings. Boxes shall have continuous welded seams and mounting feet. Welds shall be ground smooth. Boxes shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14 gauge metal and covers shall not be less than 14 gauge metal. Covers shall be gasketed with rolled lip and fastened with stainless steel clamps. Condulets shall be Form 7 wedge nut condulets with integral gaskets. Condulet covers that attach to the condulet body via threaded holes in the condulet body are not acceptable. Furnish boxes with continuous hinged doors, terminal mounting straps, and brackets. Terminal blocks shall be NEMA type, not less than 20A, 600V.
  - a. Acceptable Manufacturers:
    - 1) Hoffman Engineering Co.
    - 2) Lee Products Co.
    - 3) Keystone/Rees, Inc.
    - 4) Or equal as approved by the Engineer
3. For NEMA 4 and NEMA 4X locations, terminal boxes, junction boxes, pull boxes etc., shall be Type 304 stainless steel (NEMA 4 locations) or Type 316L stainless steel (NEMA 4X locations) unless otherwise shown on the drawings. Boxes shall have continuous welded seams and mounting feet. Welds shall be ground smooth. Boxes shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14 gauge metal and covers shall not be less than 12 gauge metal. Covers shall be gasketed and fastened with stainless steel clamps. Condulets shall be Form 7 wedge nut condulets with integral gaskets. Condulet covers that attach to the condulet body via threaded holes in the

condulet body are not acceptable. Furnish terminal boxes with hinged doors, terminal mounting straps and brackets. Terminal blocks shall be NEMA type, not less than 20A, 600V.

a. Acceptable Manufacturers:

- 1) Hoffman Engineering Co.
- 2) Lee Products Co.
- 3) Keystone/Rees, Inc.
- 4) Or equal as approved by the Engineer

4. All boxes and fittings used with PVC coated conduit shall be furnished with a PVC coating bonded to the metal, the same thickness as used on the coated steel conduit. The ends of couplings and fittings shall have a minimum of one pipe diameter PVC overlap to cover threads and provide a seal.
5. Device boxes shall be malleable iron with zinc electroplate and epoxy powder coat finish, malleable iron covers, and stainless steel screws. Provide the "deep" configuration for all devices boxes.

a. Acceptable Manufacturers:

- 1) Appleton, UNILETS Malleable Iron, Type FD
- 2) Steel Electric Products, Type FD
- 3) Or equal as approved by the Engineer

6. All terminal boxes, junction boxes, and metallic pull boxes shall have two conduit drain fittings installed in the bottom of the box to permit water to drain from the box continuously. Drain fittings shall be stainless steel, designed for use with 1/2" hubs or 1/2" drilled and tapped conduit openings.

a. Acceptable manufacturers:

- 1) Killark, KDB-1
- 2) OZ Gedney, DB-50
- 3) Or equal as approved by the Engineer

#### M. Conduit Penetration Seals and Sleeves

1. Conduit penetration seals shall be modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the conduit and the opening. The elastomeric element shall be

sized and selected per the manufacturer's recommendations and shall be suitable for use in standard service applications (-40 degree F to 250 degrees F).

2. Sleeves shall be the thermoplastic type with water stops, suitable for poured wall construction.
3. Conduit penetration seals and sleeves shall be complete assemblies supplied by a single manufacturer.
4. Acceptable manufacturers:
  - 1) GPT Link-Seal and Plastic Sleeves
  - 2) Calpico Inc. Pipe Linx and Plastic Sleeves
  - 3) Or equal as approved by the Engineer

#### N. Duct Seal

1. Duct seal shall be a non-hardening compound designed as a waterstop and moisture barrier for sealing the annular space between conduit and electrical conductors and cables.
2. Acceptable manufacturers:
  - a. O-Z Gedney DUX
  - b. Thomas & Betts, Type DX
  - c. Or equal as approved by the Engineer

#### O. Firestopping

1. Sealant
  - a. UL certified, one-part, two stage intumescent latex compound that, when exposed to high heat or flame, expands to close off voids left by the burning or melting of combustible materials. The sealant shall be capable of caulking or troweling onto vertical surfaces or overhead.
  - b. Acceptable Manufacturers
    - 1) Specified Technologies, Inc. SSS Intumescent Firestop Sealant
    - 2) Or equal as approved by the Engineer
2. Mortar

- a. UL classified, lightweight, fast drying, Portland cement-based firestop mortar
  - b. Acceptable Manufacturers
    - 1) Specified Technologies, Inc. SSM Firestop Mortar
    - 2) Or equal as approved by the Engineer
- P. Generator Connection Box
- 1. Rating
    - a. 480V, three-phase, four-wire, 800A
  - 2. Provide a UL 508A labeled generator connection box with insulated, angled Cam-Lok receptacle assemblies for connection of generator cables:
    - a. Power phases (A, B, C)
    - b. Full-rated neutral
    - c. Grounding conductor
  - 3. Enclosure
    - a. NEMA 3R, ten gauge galvanized steel, with ANSI 70 gray finish
    - b. The front door shall be removable, with padlockable wing-knob latches
    - c. The bottom door shall be removable for cable entry
    - d. Provide three phase-phase indication lights on the door
  - 4. Connections
    - a. Cam-Lok receptacles: insulated, single pole, Cooper E1016 series, female
    - b. Provide two single-pole, 400 A receptacles per phase, neutral, and ground
    - c. Provide the following color code for the cam-type receptacles:
      - 1) Phase A: brown
      - 2) Phase B: orange
      - 3) Phase C: yellow
      - 4) Neutral: white



- 5) Ground: green
  - d. Bond ground Cam-Lok receptacles to the enclosure
  - e. Cam-Lok receptacles shall be suitable for use in an outdoor, NEMA-3R environment
  - f. Provide a tin-plated copper busbar with mounting holes for mechanical lugs
  - g. Mechanical lugs shall be rated for terminating copper or aluminum conductors in a range #2 AWG- #750kcmil using a mechanical screw
  - h. Clearly mark all connections
5. Accessories
- a. Provide a phase rotation relay with an indication light on the door that will energize if the phase sequence is correct (ABC)
6. Acceptable manufacturers:
- a. PSI Control Solutions
  - b. Or equal as approved by the Engineer

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Check the approximate locations of raceway system components shown on drawings for conflicts with openings, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, consult the Engineer. Make modifications and changes required.
- B. Protection during construction:
  - 1. In addition to the requirements of Division 01, and Section 26 05 00, prior to installation, store all products in a dry location. Following installation, protect products from the effects of moisture, corrosion, and physical damage during construction. Keep openings in conduit and tubing capped with manufactured seals during construction. Cover PVC conduit, elbows, and PVC coated rigid steel conduit, nipples, elbows, and fittings from exposure to sunlight.
- C. Material and equipment installation:
  - 1. Follow manufacturer's installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between manufacturer's installation instructions, codes and regulations, and these contract documents, follow

Engineer's decision. Keep copy of manufacturer's installation instructions on the jobsite available for review at all times.

### 3.2 INSTALLATION

- A. Install raceways and boxes in a neat and workmanlike manner as described by ANSI/NECA 1 – Standard Practices for Good Workmanship in Electrical Construction and ANSI/NECA 101 – Installing Steel Conduits (Rigid, IMC, EMT).
- B. Use no circular raceway less than 3/4-inch unless otherwise approved by the Engineer.
- C. Raceway type for location and installation method unless noted otherwise on the drawings.
  - 1. Exterior, Exposed (higher than 6-inches above grade), all locations except those designated as NEMA 4X or NEMA 6P:
    - a. Rigid steel conduit
  - 2. Interior, Exposed or Concealed (Not Embedded in Concrete), all locations except those designated as NEMA 4X or NEMA 6P:
    - a. Rigid steel conduit
  - 3. Embedded within Concrete Walls, Slabs, Ductbank or Floors:
    - a. PVC Schedule 40
  - 4. Risers from concealed nonmetallic conduit, floor stub-ups, wall, or ceiling penetrations; also, all locations designated NEMA 4X or NEMA 6P:
    - a. PVC Coated rigid steel conduit
  - 5. Direct buried
    - a. PVC Schedule 40
- D. Location, Routing, and Grouping:
  - 1. Conceal or expose raceways as indicated on the drawings. Group raceways in same area together. Locate raceways at least 12 inches away from parallel runs of heated piping for other utility systems.
  - 2. Run exposed raceways parallel or perpendicular to walls, structural members, or intersections of vertical planes to provide a neat appearance. Follow surface contours as much as possible.

3. Avoid obstruction of passageways. Run concealed raceways with the minimum of bends in the shortest practical distance considering the building construction and other systems.
4. In block walls, do not run raceways in the same horizontal course with reinforcing steel.
5. In outdoor, underground, or wet locations, use watertight couplings and connections in raceways. Install and equip boxes and fittings so as to prevent water from entering the raceway.
6. Paint all threads of galvanized conduits with zinc-rich paint or liquid galvanizing compound before assembling. Touch up after assembly to cover nicks or scars.
7. Do not notch or penetrate structural members for passage of raceways except with prior approval of the Engineer.
8. Do not run raceways horizontally in equipment foundation pads.
9. Separate raceway in slabs not less than three times the largest raceway outside diameter minimum, except at raceway crossings, and then only with the approval of the Engineer.
10. Do not run raceways across walkways.
11. Embed conduits in walls, floors, slabs, or overhead in the middle one-third of the concrete and at least 3-inches from the concrete surface; thicken slabs where necessary to accommodate conduits in a manner as approved by the Engineer.
12. Pull boxes, junction boxes, and/or handholes shall be used in any conduit run where a splice is required. Pull boxes shall be provided every 200 feet of straight run, every 150 feet with 90 degrees of bends, every 100 feet with 180 degrees of bends, and every 50 feet with 270 degrees of bends.
13. Conduits must be kept within the furring lines of building walls and ceilings unless specifically noted to be exposed.
14. Provide all necessary sleeves and chases required where conduits pass through floors or walls; seal all openings and finish to match adjacent surfaces.
15. Where conduit runs change from concrete embedded within floors, slabs, or equipment pads to exposed, maintain a minimum separation of 6-inches between the closest wall, pad, or structure face and the outer edge of the exposed conduit.

E. Special Locations:

1. In exterior light pole foundations; extend PVC schedule 40 conduit 6 inches above the top of the foundation.
2. Where conduit changes from underground direct burial to exposed, extend PVC coated rigid steel conduit minimum 6-inches above finished grade.
3. Where conduit changes from concrete embedded within walls, slabs, and floors to exposed, embed PVC coated rigid steel conduit and factory manufactured elbows from the concrete to exposed, and extend PVC coated rigid steel conduit a minimum of 6-inches beyond the concrete walls, slabs, or floors.
4. Under equipment mounting pads (direct burial), use PVC coated rigid steel conduit.
5. Final Connection to Equipment:
  - a. Make final connection to motors, wall or ceiling mounted fans and unit heaters, dry type transformers, valves, local instrumentation, and other equipment where flexible connection is required to facilitate removal or adjustment of equipment with 18-inch minimum, 60-inch maximum lengths unless otherwise approved by the Engineer, of liquid-tight, PVC-jacketed flexible conduit where the required conduit size is 4 inches or less. For larger sizes, use rigid steel conduit as specified.
  - b. The flexible conduit shall be long enough to allow the item to which is connected to be withdrawn or moved off its base. Use liquid-tight flexible metal conduit in outside areas, process areas exposed to moisture, and areas required to be oil-tight and dust-tight.

F. Support:

1. Support raceways at intervals not exceeding CEC requirements unless otherwise indicated. Support multiple raceways adjacent to each other by ceiling trapeze. Support individual raceways by wall brackets, strap hangers, or ceiling trapeze, fastened by toggle bolts on hollow masonry units, expansion shields on concrete or brick, and machine screws or welded thread studs on steelwork.
2. Threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion shields.
3. Support all raceways from structural members only. Do not support from pipe hangers or rods, cable tray, or other conduit.
4. Do not use nails anywhere or wooden plugs inserted in concrete or masonry as a base for raceway or box fastenings. Do not weld raceways or pipe straps to steel structures. Do not use wire in lieu of straps or hangers.

5. Support flexible metal conduit with conduit clamps, except where the flexible metal conduit is fished and where sections less than 4 feet in length are used in concealed areas to supply lighting fixtures in accordance with the CEC.

G. Bends:

1. Make changes in direction of runs with symmetrical bends or cast metal fittings. Make bends and offsets of the longest practical radius. Avoid field-made bends and offsets where possible, but where necessary, make with an acceptable hickey or conduit bending machine. Do not heat metal raceways to facilitate bending.
2. Make bends in parallel or banked runs of raceways from the same center or centerline so that bends are parallel and of neat appearance. Factory elbows may be used in parallel or banked raceways if there is a change in the plane of the run and the raceways are of the same size. Otherwise, make field bends in parallel runs.
3. For PVC Schedule 40 conduits, use factory made elbows for all bends 30 degrees or larger. Use acceptable heating methods for forming smaller bends.
4. Make no bends in flexible conduit that exceed allowable bending radius of the cable to be installed or that significantly restricts the conduits flexibility.

H. Threaded Joints:

1. Paint all field-cut threads with zinc rich paint or liquid galvanizing compound for rigid steel conduit and for PVC-coated rigid steel conduit after removal of chips and cleaning with solvent. Use approved, highly conductive jointing compound on all joints
  - a. Acceptable Manufacturers:
    - 1) Appleton Type TLC
    - 2) Or equal as approved by the Engineer

I. Bushing and Insulating Sleeves:

1. Where rigid steel conduit, PVC coated rigid steel conduit, or liquid-tight flexible metal conduit enters metal enclosures, install an insulated throat grounding bushing on the end of each conduit. Install a bonding jumper from the bushing to any equipment ground bus or ground pad. Interconnection of bonding jumpers from each conduit grounding bushing to the equipment ground bus or ground pad is acceptable.
2. If neither a ground bus or ground pad exists, connect the bonding jumper to the metallic enclosure with a bolted-lug connection.

3. Make conduit connections to NEMA 3R, NEMA 4, or NEMA 4X enclosures, junction boxes, terminal junction boxes, or device outlet boxes with watertight, corrosion resistant hubs. The conduit connections shall maintain the integrity of the enclosure NEMA rating.

J. Expansion Joints:

1. Provide expansion/deflection fittings for raceways crossing expansion joints in structures, between structures and walkways or concrete slabs to compensate for expansion, contraction, and deflection. Provide expansion only fittings in every 200 feet of exposed, straight, rigid steel conduit runs.

K. PVC Coated Rigid Steel Conduit:

1. Install in strict accordance with the manufacturer's instructions. Touch up any damage to the coating with conduit manufacturer acceptable patching compound. PVC boot shall cover all threads. Where belled conduits are used, bevel the unbelled end of the joint before joining. Leave no metallic threads uncovered. Clean field threads with solvent and coat with urethane touch-up. Keep two cans of urethane touch-up at each threading station.

L. Penetrations:

1. Seal the interior of all raceways entering structures or buildings at the first box or outlet with duct seal to prevent the entrance into or exit from the structure of gases, liquids, or rodents.
2. Where conduit enters a new structure above ground or below grade through a concrete roof or wall, install a watertight conduit penetration seal and sleeve. Install the sealing assembly such that it may be tightened at any time from the interior side. For wall and roof penetrations, dry pack with non-shrink grout around the conduit and the sealing assembly on the exterior side. Where conduit enters a new structure below grade through a concrete floor, cast the conduit directly into the concrete floor slab.
3. Where conduit enters an existing structure above ground or below grade through a concrete roof or wall, core drill through the existing roof or wall and install a watertight conduit penetration seal. Install the sealing assembly such that it may be tightened at any time from the interior side. Dry pack with non-shrink grout around the conduit and the sealing assembly on the exterior side.
4. Where raceways penetrate fire-rated walls, floors, or ceilings, provide firestop material specified herein in openings around electrical penetrations to maintain the fire-resistance rating.
5. All connections between conduits and NEMA 1, 1A, and 12 enclosures shall be made with hubs outside and bushings on the inside. All NEMA 3R, 4, and

4X enclosures without integral watertight hubs shall have watertight, threaded, rigid, conduit hubs.

M. Wireways

1. Mount wireways securely in accordance with the CEC and manufacturer's instructions. Locate removable cover on accessible vertical face of wireway unless otherwise indicated.

N. Preparation for Pulling in Conductors

1. Do not install crushed or deformed raceways. Avoid traps in raceways. Take care to prevent the lodging of plaster, concrete, dirt, or trash in raceways, boxes, fittings, and equipment during the course of construction. Make raceways entirely free of obstructions or replace them. Ream all raceways, remove burrs, and clean raceway interior before introducing conductors or pull tape.
2. For underground concrete-encased and direct-buried raceways, prove the integrity of the raceway system as specified in Section 26 05 43 before pulling in conductors.
3. Immediately after installation, plug or cap all raceway ends with watertight and dust-tight seals until the time for pulling in conductors.

O. Empty Raceways

1. Certain raceways will have no conductors pulled in as part of this Contract. Identify with conduit tags at each end and at any intermediate pull point of each such empty raceway. Provide a removable cap over each end of empty raceways. Provide a detectable pull tape with a minimum of 3-feet of slack at each end in each empty raceway. Provide cap with eyelet for attaching the pull tape.
2. Strip insulation from the jacket of the detectable pull tape wire and attach to the ground rod in each manhole or pullbox, to the frame of metallic pullboxes, to switchgear ground busses, to switchboard ground busses, and to control panel ground busses.

3.3 PAINTING

- A. Paint exposed metal raceway systems in finished areas in accordance with the requirements in Section 09 91 00.

END OF SECTION

## SECTION 26 05 53

### IDENTIFICATION FOR ELECTRICAL SYSTEMS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section includes:

1. All electrical equipment and systems shall include identification tags or nameplates as shown on the drawings and as specified herein.
2. The Contractor shall develop a tagging system in accordance with the information shown on the Drawings and the procedure specified in this Section.

###### B. Related Sections:

1. Section 01 91 13.10 – Asset Identification Tags
2. Section 26 05 00 – Common Work Results for Electrical

##### 1.2 SUBMITTALS

- ###### A.
- A tagging system scheme or schedule shall be submitted in accordance with 01 9113.10 – Asset Identification Tags and 26 05 00 – Common Work Results for Electrical to the Engineer for review and approval prior to tagging of equipment.

#### PART 2 - PRODUCTS

##### 2.1 PRODUCTS

###### A. Conduit Identification Tags

1. Conduit tags shall be of the reusable labeling type so that changing of the labels can occur without removing the tag from the conduit. Construct the label holder so that the labels can slide on and off when they need to be changed or replaced. The conduit tags shall be suitable for industrial use.
  - a. Outdoor or indoor (below grade) locations:
    - 1) Provide an aluminum tag holder of sufficient size to hold the alphanumeric conduit tag designations specified in the conduit schedule on the drawings.



- 2) Provide screen printed aluminum tags with black letters on yellow background. Provide horizontal orientation with nominal 1” letter height using Helvetica Black Condensed font.
    - b. Indoor locations (above grade) locations:
      - 1) Provide a polyethylene tag holder of sufficient size to hold the alphanumeric conduit tag designations specified in the conduit schedule on the drawings.
      - 2) Provide hot stamped polyethylene tags with black letters on yellow background. Provide horizontal orientation with nominal 1” letter height using Helvetica Black Condensed font.
  2. Attach the conduit tag holder to the conduit using #18 AWG 316 tie wire.
  3. Provide equipment and tools to make the labels and connect the tags to the conduits.
  4. In addition to the conduit number tags, provide separate “Caution Fiber Optic Cable” labels where fiber optic conduits are shown on the Drawings.
  5. Acceptable Manufacturers:
    - a. Almetek ID Marking Systems, Mini-Tag or E-Z Tags
      - 1) Outdoor tag holder: TH-0X-A/SL, where X is the number of characters
      - 2) Outdoor tags: H300\_
      - 3) Indoor tag holder: TC-CP, where X is the number of characters
      - 4) Indoor tags: H900\_
      - 5) Fiber Optic Cable tag: FO250
    - b. Or equal as approved by the Engineer
- B. Wire labels for #1 AWG and smaller
1. Wire labels relying on adhesives or taped-on markers are not acceptable.
  2. Individual wires #1 AWG and smaller in each cable or wire bundle shall be identified with legible permanent sleeve of white heat-shrink polyolefin with machine printed weatherproof black marking.
  3. Meet UL Standard 224 for flammability

4. Provide necessary tools and accessories to print labels and shrink labels.
  5. Acceptable Manufacturers:
    - a. Brady Model B-342 Brady PermaSleeve 1.5" width one-sided thermal transfer labels
    - b. Panduit
    - c. Or equal as approved by the Engineer
- C. Wire labels for #1/0 and larger sizes and cable identification tags
1. Cable tags shall be of the reusable labeling type so that changing of the labels can occur without removing the tag from the conduit. Construct the label holder so that the labels can slide on and off when they need to be changed or replaced. The tags shall be suitable for industrial use.
  2. Tag holders shall be PVC for horizontal orientation sized to hold the alphanumeric conduit tag designations specified in the cable schedule on the drawings.
  3. Tags shall be black letters on yellow background.
  4. Attach the cable tag holder to the cable or wire bundle using UV protected, self-locking black nylon cable ties.
  5. Acceptable Manufacturers:
    - a. Almetek ID Marking Systems, Mini Tags
    - b. Tyco Electronics, K-Type cable Markers
    - c. Or equal as approved by the Engineer
- D. Equipment Nameplates
1. Reference Section 01 91.13.10 for nameplate product and installation requirements, Reference Drawing 9492-G-007 for nameplate letter and background color requirements. Note that per Drawing 9492-G-007, all cabinet nameplates shall have white background and black lettering. For hanging tag applications, use the color schedule shown on the Drawing.
- E. Wood electrical utility poles and substation yard related
1. Crossarm and pole marking

- a. “HIGH VOLTAGE” crossarm marker shall be polyethylene and shall have 3” high black letters on yellow background. Overall length of sign shall be 3.5” x 14”.
  - b. Acceptable manufacturers:
    - 1) Electromark
    - 2) Or equal as approved by the Engineer
2. Pole identification
- a. 3” high embossed metal digits that are held in an aluminum panel slide-in marker holder. Digits shall be black on a yellow background. The digits shall slide into the marker holder from the back and once in place, the edges of the marker holder shall be crimped so that the digits cannot be pried out from the front.
  - b. Pole identification shall have a vertical orientation with the following tag format:

$$\begin{array}{c} 01 \\ \hline 14 \end{array}$$

where “01” is the mile number, “14” is the pole number in the reference mile number, and a horizontal bar is between the upper mile number and lower pole number. Numbering shall always use two digits and leading zeroes shall be added to numbers 1-9 as required so that a two digit number is obtained.

- c. Acceptable manufacturers:
    - 1) Electromark – StrongHolds
    - 2) Or equal as approved by the Engineer
3. Ownership identification
- a. Provide 3" square property ID label for each pole as shown below:



**OWNED POLE**

- b. ID label shall have a screen printed color graphic over a white background on a 20-mil anodized aluminum plate suitable for nailing on a wood pole. Protect the graphic with a clear anodized layer that resists heat and sunlight.
  - c. Acceptable manufacturers:
    - 1) Electromark – E-Guard
    - 2) Or equal as approved by the Engineer
4. Dating disc
- a. Provide a 2" circular dating disc as shown below:



- b. The dating disc shall use the actual year that the pole was set (“2008” is simply an example for illustrative purposes).
  - c. The dating disc shall have black text made from silver particles over a white background on a 20-mil anodized aluminum plate suitable for nailing on a wood pole. Protect the graphic with a clear anodized layer that resists heat and sunlight.
  - d. Acceptable manufacturers:
    - 1) Electromark – E-Guard
    - 2) Or equal as approved by the Engineer
5. Dating nail
- a. Used to attached the dating disc to the pole. Dating nail shall be hot-dip galvanized with the year that the pole is set on the nail head.
  - b. Acceptable manufacturers:
    - 1) Hubbell Power Systems (Chance)
    - 2) Or equal as approved by the Engineer
6. Rigid phase markers

- a. 3" x 3" marker with white background and red letters. Provide markers with "A", "B", and "C" engraving. Providing rigid phase markers at the following locations:
  - 1) Each low and high rigid bus support
  - 2) Each disconnect switch platform
  - 3) Each metering unit, CCVT, and wavetrap
- b. Acceptable manufacturers:
  - 1) Electromark – Phaz/Fixed
  - 2) Or equal as approved by the Engineer

F. Phase rotation markers.

1. 2" X 2" yellow polyester marker with black lettering. Markers are required for the following power distribution equipment:
  - a. High- or medium-voltage switchboards
  - b. Medium-voltage switchgear at the incoming line compartment
  - c. Medium-voltage variable frequency drives at the input fused disconnect switch
  - d. All 480Y/277 VAC and 208Y/120 VAC panelboards
2. Acceptable manufacturers:
  - a. Electromark – Phaze/Order
  - b. Or equal approved by the Engineer

G. Cable route markers

1. Galvanized screw anchor with 6" diameter copper alloy identification top plate that indicates a buried cable or ductbank routing. Custom engrave the following information in the top plate insert:
  - a. EBMUD
  - b. Number of feet to the next pullbox, manhole, or connection, along with the pullbox/manhole/connection designation.
2. Acceptable manufacturers:

- a. Hubbell Power Systems (Chance)
- b. Or equal as approved by the Engineer

#### H. Warning tape

1. Provide underground detectable warning tape. The tape shall be constructed of solid aluminum core that is laminated with a protective clear film on both sides, sealing and protecting the graphics from underground moisture, acids and alkalis. Tape color shall be red and be 6-inch minimum width, with black lettering, for use in trenches containing electric circuits. Use tape with printed warning "CAUTION-BURIED ELECTRIC LINE BELOW".
2. Acceptable Manufacturers:
  - a. Stanco, Inc. Underground Tape No. PUWT-604D
  - b. Panduit Corp. Hazard Tape Part No. HTDU6R-E
  - c. Or equal as approved by the Engineer

#### I. Pushbutton Legend Plates

1. Provide legend plates for pushbuttons, selector switches and pilot lights with inscription as shown on the drawings. Provide adapter ring as necessary to fit devices with legend plates. Legend plates shall be made by same manufacturer as pushbutton device, selector switch and pilot light.
2. Acceptable Manufacturers:
  - a. Eaton HT800 Series
  - b. General Electric CR104P Series
  - c. Allen Bradley Bulletin 800T
  - d. Or equal as approved by the Engineer

#### J. Circuit Label for Receptacle and Light Switches

1. Provide phenolic nameplate with black letter on white background located on or directly above the receptacle or light switch faceplate indicating source of power (panelboard name and circuit number(s)).

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Overhead distribution and substation identification products

1. Install as shown on the drawings and as specified in Section 33 71 16.33 Wooden Electrical Utility Poles and Section 33 72 13 Substation Steel Structures.
- B. Cable route markers
1. Install a cable route marker over every underground ductbank on the project. Install at maximum 100 foot intervals with a minimum of
    - a. One cable marker per ductbank section between consecutive pullboxes/manholes
    - b. One cable marker per ductbank section between a manhole/pullbox and a building/structure when the distance is greater than or equal to 50 feet.
  2. Cable route markers shall be installed as close to the ductbank as possible and in the middle of the ductbank run.
- C. Conductor Identification:
1. Identification system shall use the format shown on Cable Schedule Drawings. For single conductor cables, the wire bundle shall be considered as an overall cable and a cable tag applied accordingly.
  2. Identify conductors at each termination and in all accessible locations such as manholes, handholes, control panels, panelboards, pull boxes, junction boxes, wireways, junction terminal boxes, switchgear, motor starters, disconnect switches, etc. For identification, use type of conductor and cable tags specified herein. A typical circuit will have the following identification: conduit tag, overall cable tag, and individual wire labels.
- D. Legend Plates and Nameplates
1. Install nameplates on devices or equipment as specified in Section 01 91 13.10.
  2. Provide legend plate engraving for pilot devices as shown on the drawings; if not shown, Contractor shall submit a schedule showing proposed legend plate text for the Engineer's approval.

### 3.2 TAGGING OF WIRES AND CABLES

- A. All wires and cables shall be tagged and laced in pull or junction boxes, manholes, handholes, wireways, and at each termination. Each wire and cable shall be tagged at least once as it passes through each pull or junction box, manhole, handhole, and at each termination. Each wire and cable shall be tagged at least once as it passes through wireways. Wires and cables shall be laced so that the wires of the individual circuits are laced together by circuit and the laced-together circuit or cable shall be

tagged with the cable number. Power, lighting, control, alarm, annunciator, and instrumentation wiring shall be bundled, laced, and tagged, as specified herein.

- B. All wires and cables within control panels, switchgear, motor control centers, mechanical mounting panels, terminal junction boxes, etc., shall be tagged at each termination with conductor tags as specified. All circuit identification tags shall be readily accessible for inspection at the locations cited above.
- C. Label wires with cable numbers as shown on the drawings. Cable labels shall be placed within one inch of the ends of the cable jacket.
- D. All spare pairs shall be bundled and labeled with the cable designation. All individual pairs shall be tagged to enable identification of spare pairs when making future terminations.
- E. Identify multicircuit control cables and individual instrumentation and control circuits as indicated on the Drawings. Multicircuit cable shall be tagged with the cable name around the entire cable assembly and shall have the individual circuits tagged as well. Tag twisted, shielded pairs and where exposed, multi-pair cable twisted pairs around each pair separately.
- F. Identify each individual conductor at each termination. This includes such locations as switchgear, switchboards, motor control centers, variable frequency drives, control panels, junction/terminal boxes, all field devices, security panels and junction boxes, and all other locations where conductors are terminated. Identify the termination of these conductors in accordance with the accepted shop drawings. Tag conductors with sleeve type labels.
- G. Where more than 1 nominal voltage system exists, identify each ungrounded system conductor by phase and system. Permanently post means of identification at each branch-circuit panelboard, switchboard, switchgear, motor control center, or other type of power distribution equipment.
- H. Include the following minimum information for wire and cable identification:
  - 1. Circuit number or load identification tag number
  - 2. Origin (from source)
  - 3. Destination (to load)
- I. Wire Numbers:
  - 1. The Contractor shall coordinate the wire numbering system with all vendors of equipment so that each and every field wire has a unique wire number associated with it for the entire system.



- a. Wire numbers for field instrumentation and circuits shall correspond to the designation shown in the cable schedule and the E-200 or E-400 series drawings. Generally, the instrument tag is the wire number, with appropriate suffix modifiers to give each wire a unique name. Examples:
  - 1) Control circuit C1C1 (from the cable schedule) connecting a temperature switch with tag number TSH-001 to a process control panel would have wire numbers specified in the E-200 or E-400 series drawings as TSH001+, TSH001-, and TSH001SH, assuming a twisted shield pair.
  - 2) Control circuit C9J1 (from the cable schedule) connecting a thermostat to an air handling unit with tag number TE-075 would have wire numbers TE075+, TE075-, TE075RTN, and TE075SH, assuming a twisted shield triad.
  - 3) Control circuit A1C1 does not have any specific wire numbers shown on the E-200 or E-400 drawings. Therefore, use A1C1-1, -2, -3, etc., assuming a multiconductor cable.
- b. Wire numbers for field power circuits shall correspond to the designation shown in the cable schedule on the drawings, with appropriate suffix modifiers to give each wire a unique name. Examples:
  - 1) Power circuit M1P1 on the cable schedule going to a three-phase motor: use suffix modifiers -1, -2, -3, and -G for the individual three-phase and ground conductors).
  - 2) Power circuits for receptacles and lighting: use the panelboard circuit number(s) where the branch circuit originates (for example, L5P16 with suffix modifiers -L, -N, and -G for a 120VAC lighting circuit originating at panelboard 5, circuit 16).
- c. For telecommunication and specialty control circuits, provide the cable designation shown on the cable schedule. Unless otherwise specified on the Drawings, it is not necessary to provide individual wire numbers for these applications.

END OF SECTION

## SECTION 33 12 01

### BASIC MECHANICAL MATERIALS AND METHODS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: Basic design and performance requirements for all mechanical equipment and systems.
- B. Related sections:
  - 1. Section 01 75 17 – Field Testing and Startup
  - 2. Section 01 77 00 – Closeout Procedures
  - 3. Section 01 91 13.10 – Asset Identification Tags
  - 4. Section 03 60 00 – Grouting
  - 5. Section 09 91 00 – Painting
  - 6. Section 22 05 53.05 – Pipe Identification
  - 7. All sections in Division 26 – Electrical
  - 8. All sections in Division 33 – Utilities
  - 9. Section 40 20 20 – Mechanical Piping
- C. Provisions specified under each individual technical equipment specification section prevail over and supersede conflicting provisions as specified in this section.

##### 1.2 REFERENCE STANDARDS FOR DESIGN, INSTALLATION & TESTING

- A. Associated Air Balance Council (AABC): Various
- B. American Bearing Manufacturers Association (ABMA):
  - 1. ABMA 9 – Load Ratings and Fatigue Life for Ball Bearings
  - 2. ABMA 11 – Load Ratings and Fatigue Life for Roller Bearings
  - 3. Various
- C. American Gas Association (AGA): Various

- D. American Gear Manufacturer's Association (AGMA) Standards:
1. ANSI/AGMA 2001-D – Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth
  2. ANSI/AGMA 6000-B – Specification for Measurement of Linear Vibration on Gear Units
  3. ANSI/AGMA 6010-F – Standard for Spur, Helical, Herringbone, and Bevel Enclosed Drives
  4. ANSI/AGMA 6019-B – Standard for Gear motors using Spur, Helical, Herringbone, Straight Bevel or Spiral Bevel Gears
  5. ANSI/AGMA 6025-D – Sound for enclosed Helical, Herringbone and Spiral Bevel Gear Drives
  6. Various
- E. Air Movement and Control Association (AMCA) Manual:
1. 200-3 Fans Application Manual
  2. Various
- F. American National Standards Institute (ANSI) Standards:
1. Z535.1 – Safety Color Code
  2. Various
- G. American Petroleum Institute (API) Standards:
1. 5L – Specification for Line Pipe
  2. 541 – Form-wound Squirrel-Cage Induction Motors - 500 Horsepower and Larger
  3. 598 – Valve Inspection and Testing
  4. 609 – Butterfly Valves
  5. 610 – Centrifugal Pumps
  6. 617 – Centrifugal Compressors
  7. 618 – Reciprocating Compressors
  8. 619 – Rotary-Type Positive Displacement Compressors

9. 650 – Welded Steel Tanks for Oil Storage
  10. 686 – Machinery Installation and Installation Design (Recommended Practice)
  11. Various
- H. American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) Standards: Various
- I. American Society of Mechanical Engineers (ASME):
1. B16.1 – Cast Iron Pipe Flanges and Flanged Fittings
  2. B16.3 – Malleable Iron Threaded Fittings
  3. B16.5 – Pipe Flanges and Flanged Fittings
  4. B16.9 – Factory-Made Wrought Buttwelding Fittings
  5. B16.11 – Forged Fittings, Socket-Welding and Threaded
  6. B16.14 – Cast Bronze Threaded Fittings
  7. B16.18 – Cast Copper Alloy Solder Joint Pressure Fittings
  8. B16.22 – Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
  9. B16.24 – Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 400, 600, 900, 1500, and 2500
  10. B16.28 – Wrought Steel Buttwelding Short Radius Elbows and Returns
  11. B16.34 – Valves, Flanged, Threaded and Welding End
  12. B16.36 – Orifice Flanges
  13. B16.42 – Ductile Iron Pipe Flanges and Flanged Fittings, Class 150 and 300
  14. B16.47 – Large Diameter Steel Flanges
  15. B31.1 – Power Piping
  16. B31.9 – Building Services Piping
  17. B31.2 – Fuel Gas Piping
  18. B31.3 – Process Piping
  19. B36.10M – Welded and Seamless Wrought Steel Pipe

20. B36.19M – Stainless Steel Piping
  21. PTC 9 – Displacement Compressors, Vacuum Pumps and Blowers
  22. ASME PTC 8.2 – Performance Test Code for Centrifugal Pumps
  23. ANSI/ASME PTC 10 – Performance Test Code - Compressors and Exhausters
  24. ANSI/ASME PTC 17 – Performance Test Code - Reciprocating Internal-Combustion Engines
  25. ANSI/ASME PTC 11 – Performance Test Code - Measurement of Shaft Horsepower - Instruments and Apparatus
  26. Boiler and Pressure Vessel Code – Section VIII
  27. Various
- J. ASTM International (ASTM):
1. A36 – Standard Specification for Structural Steel
  2. A53 – Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc-Coated, Welded and Seamless
  3. A48 – Standard Specification for Gray Iron Castings
  4. A106 – Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
  5. A526 – Standard Specification for Steel Sheet, Zinc Coated by the Hot Dip Process, Commercial Quality
  6. A802-2006 – Standard Practice for Steel Castings, Surface Acceptance Standards, Visual Examination
  7. A834-2006 – Standard Specification for Common Requirements for Iron Castings for General Industrial Use
  8. A903-2007 – Standard Specification for Steel Castings, Surface Acceptance Standards, Magnetic Particle and Liquid Penetrant Inspection
  9. A1011 – Standard Specification for Steel, Sheet and Strip, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low Alloy with Improved Formability
  10. A1018 – Standard Specification for Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability

11. B61 – Standard Specification for Steam or Valve Bronze Castings
  12. B62 – Standard specification for Composition Bronze or Ounce Metal Castings
  13. E527 – Standard Practice for Numbering Alloys and Metals (UNS)
  14. D3370-95a – Standard Practices for Sampling Water from Closed Conduits
  15. D6284-02 – Standard Test Method for Rubber Property - Effect of Aqueous Solutions with Available Chlorine and Chloramine
  16. Various
- K. American Water Works Association (AWWA) Standards:
1. C207 – Steel Pipe Flanges
  2. C208 – Dimensions for Fabricated Steel Water Pipe Fittings
  3. C504 – Rubber-Seated Butterfly Valves
  4. C507 – Ball Valves
  5. C508 – Swing Check Valves
  6. C509 – Resilient Seated Gate Valves
  7. C512 – Air Release, Air/Vacuum and Combination Air Valves
  8. C515 – Reduced –Wall, Resilient-Seated Gate Valves
  9. C518 – Dual-Disc Swing Check Valves
  10. C540 – Power-Actuating Devices for Valves and Slide Gates
  11. Various
- L. American Welding Society (AWS) Standards:
1. A2.4 – Standard Symbols for Welding, Brazing and NDE
  2. A3.0 – Standard Welding Terms and Definitions
  3. D1.1 – Structural Welding Code
  4. Various
- M. Compressed Gas Association (CGA) Standards: Various
- N. Crane Manufacturers Association of America (CMAA) Specifications:

1. CMAA No. 70 – Specifications for Top-Running Bridge and Gantry Type Multiple Girder Electric, Overhead Traveling Cranes
  2. CMAA No. 74 – Specifications for Top Running & Under Running Single Girder Electric Traveling Cranes Utilizing Under Running Trolley Hoist
- O. Ductile Iron Pipe Research Association (DIPRA) Publications: Various
- P. EBMUD Engineering Standard Practices (ESPs)
- Q. EBMUD Engineering Standard Drawings:
1. 9494-G-1 and 2, Abbreviations for Water Facilities
  2. 9492-G-001 thru 007
  3. Various
- R. Hydraulic Institute Standards (HI):
1. 1.1-1.5 – Centrifugal Pumps – Nomenclature, Definitions, Application and Operation
  2. 1.6 – Centrifugal Pump Tests
  3. 2.1-2.5 – Vertical Pumps – Nomenclature, Definitions, Application and Operation
  4. 2.6 – Vertical Pump Tests
  5. 3.1-1.5 – Rotary Pumps – Nomenclature, Definitions, Application and Operation
  6. 3.6 – Rotary Pump Tests
  7. 4.1-4.6 – Sealless Rotary Pumps – Nomenclature, Definitions, Application, Operation and Test.
  8. 5.1-1.6 – Sealless Centrifugal Pumps – Nomenclature, Definitions, Application, Operation and Test
  9. 6.1-6.5 – Reciprocating Power Pumps – Nomenclature, Definitions, Application and Operation
  10. 7.1-7.5 – Controlled Volume Pumps – Nomenclature, Definitions, Application and Operation
  11. 9.1-9.5 – Pumps – General Guidelines for Types, Definitions, Application and Sound Measurement

- 12. Various
- S. Institute of Electrical and Electronic Engineers (IEEE):
  - 1. 803.1 – Recommended Practice for Unique Identification in Power Plants and Related Facilities — Component Function Identifiers
  - 2. Various
- T. Instrumentation, Systems, and Automation Society (ISA) Standards:
  - 1. S5.1 – Instrumentation Symbols and Identification
  - 2. S20 – Specification Forms for Process Measurement and Control Instruments, Primary Elements, and Control Valves
  - 3. S75.11 – Inherent Flow Characteristics and Rangeability of Control Valves
  - 4. Various
- U. Manufacturers Standardization Society (MSS) Standards:
  - 1. SP-54 – Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components – Radiographic Examination Method
  - 2. SP-55 – Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components – Visual Method for Evaluation of Surface Irregularities
  - 3. SP-58 – Pipe Hangers and Supports – Materials, Design and Manufacture
  - 4. SP-68 – High Pressure Offset Seat Butterfly Valves
  - 5. SP-69 – Pipe Hangers and Supports – Selection and Application
  - 6. SP-89 – Pipe Hangers and Supports – Fabrication and Installation Practices
  - 7. SP-91 – Guidelines for Manual Operation of Valves
  - 8. SP-101 – Part-Turn Valve Actuator Attachment
  - 9. SP-108 – Resilient-Seated Cast-Iron Eccentric Plug Valves
  - 10. Various
- V. National Electrical Testing Association (NETA):
  - 1. MG-1 – Motors and Generators
  - 2. Various



- W. National Fire Code
- X. National Fire Protection Association (NFPA) Standards:
  - 1. Fire Prevention Code Handbook, 2012 Edition
  - 2. NFPA13 – Installation of Sprinkler Systems
  - 3. NFPA30 – Flammable & Combustible Liquids Code
  - 4. NFPA54 – National Fuel Gas Code
  - 5. NFPA58 – Liquefied Petroleum Gas Code
  - 6. Various
- Y. National Sanitation Foundation (NSF) Standards:
  - 1. 14 - Plastics Piping System Components and Related Materials
  - 2. 61G – Drinking Water System Components – Health Effects and Lead Content
  - 3. 372 – Drinking Water System Components – Lead Content
  - 4. Various
- Z. Overhead Electrical Crane Institute (OECI): Various
- AA. Occupational Safety and Health Act (OSHA): Various
- BB. Pipe Fabrication Institute (PFI)
  - 1. ES-3 – Fabricating Tolerances
  - 2. ES-4 – Hydrostatic Testing of Fabricated Piping
  - 3. ES-24 – Pipe Bending Methods, Tolerances, Process and Material Requirements
- CC. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
  - 1. HVAC Systems Duct Design.
  - 2. Various.
- DD. State and Local Codes:
  - 1. CEC-400-2012-004-CMF-Rev 2 – Energy Efficiency Standards for Residential and Nonresidential Buildings, published by California Energy Commission (CEC)

2. California Mechanical Code, published by the International Association of Plumbing & Mechanical Officials (IAPMO), 2013 Edition
3. California Plumbing Code, published by the International Association of Plumbing & Mechanical Officials (IAPMO), 2013 Edition
4. Various

EE. Ten States Standards:

1. Recommended Standards for Water Works
2. Recommended Standards for Wastewater Facilities

FF. Underwriters' Laboratories, Inc. (UL) Approvals: Various

### 1.3 DEFINITIONS

- A. Special Tools: Tools that have been specifically made for use on unit of equipment for assembly, disassembly, repair, or maintenance
- B. Resonant Frequency: That frequency at which a small driving force produces an ever-larger vibration if no dampening exists
- C. Rotational Frequency: The revolutions per unit of time usually expressed as revolutions per minute
- D. Critical Frequency: Same as resonant frequency for the rotating elements or the installed machine and base
- E. Peak Vibration Velocity: The root mean square average of the peak velocity of the vibrational movement times the square root of 2 in inches per second
- F. Rotational Speed: Same as rotational frequency
- G. Maximum Excitation Frequency: The excitation frequency with the highest vibration velocity of several excitation frequencies that are a function of the design of a particular machine
- H. Critical Speed: Same as critical frequency
- I. Free Field Noise Level: Noise measured without any reflective surfaces (an idealized situation); sound pressure levels at 3 feet from the source unless specified otherwise

### 1.4 MECHANICAL DESIGN DRAWINGS

- A. Material Lists in Contract Drawings: The material lists included in the mechanical contract drawings are intended to provide general identification of the devices

shown on the mechanical drawings. The material lists do not completely show all required devices, and quantities shown are approximate. Some pipe fittings, gaskets, bolting, miscellaneous hardware, and other items may not be included in the material lists, but are required. The Contractor shall furnish and install all materials necessary for a complete and operable system.

- B. Mechanical Drawings Developed for the District: Mechanical drawings and material lists developed for the District shall comply with the requirements specified hereinafter in MECHANICAL DESIGN REQUIREMENTS.

1.5 MECHANICAL DESIGN REQUIREMENTS

- A. Site Climatic Conditions:

District Location	West of Hill	East of Hills	Upcountry
Summer (0.5%)	89° F DB	97° F DB	103 ° F DB
	66° F WB	68° F WB	70 ° F WB
Winter	28° F	21° F	20° F
Mean Daily Range:	23° F	30° F	36° F

- B. Environmental Conditions:

1. Site Elevations (above mean sea level): 230 feet
2. 100 Year Flood Elevation: Below site elevation.
3. Max Cooling Water Temperature: 66° F

- C. Noise Limits and Abatement:

1. The design of any equipment installations shall conform to the maximum acceptable noise level and duration as defined by OSHA, city codes and applicable CEQA documentation. Noise shall be within both workplace limits for personnel exposure and property line limits. Insulation, sound traps, sound enclosures, and silencers shall be used as required to obtain acceptable levels.

- D. Drawings:

1. All drawings prepared for the District shall comply with the following requirements.
2. Prepare all project drawings utilizing District standard drawing symbols, identification systems, equipment ID tagging systems, and abbreviations. The following is a list of District Standard Drawings, which shall be used as a

guideline for drawing preparation; these drawings will also be included in the project drawing list:

Drawing Number	Description
9492-G-000.1	Abbreviations for Water Facilities Design Drawings, A Thru F
9492-G-000.2	Abbreviations for Water Facilities Design Drawings, G Thru R
9492-G-000.3	Abbreviations for Water Facilities Design Drawings, S Thru Z
9492-G-002	General Legend, Symbols, and Abbreviations For P&ID Drawings
9492-G-003	Symbols for P&ID Drawings – Valves, Fittings, and Miscellaneous Symbols, Sheet 1 of 3
9492-G-004	Symbols for P&ID Drawings – Sensing Elements, Sheet 2 of 3
9492-G-005	Symbols for P&ID Drawings – Equipment, Sheet 3 of 3
9492-G-006	Equipment Tag Number Codes and Colors, Sheet 1 of 2
9492-G-007	Equipment Tag Number Codes and Colors, Sheet 2 of 2

3. Abbreviations: Definitions of any abbreviations used in this document can be found on EBMUD Standard Drawings 9494-G-1 & 2, “Abbreviations for Water Facilities”. Use these abbreviations on all drawings.
4. System and Equipment Codes: Definitions of these codes can be found on EBMUD Standard Drawing 9492-G-001.2, G-006 and G-007, “Equipment Tag Number Codes and Colors”. Use these codes in all equipment, valve and instrumentation references in drawings and specifications.
5. Drafting Symbols: Definitions of the symbols for the P&ID drawings can be found on EBMUD Standard Drawings 9492-G-001 thru G-005. Use these symbols on all P&ID drawings and as appropriate on schematic and isometric style drawings and details. Welding symbols shall conform to AWS 2.4.
6. Drawing Detail: Drawings shall contain scale plan, section and detail views. Schematics and isometric drawings may be used for additional detail. Provide sufficient detail to fabricate and install the design. Components shall be called out with sequentially numbered item bubbles. All piping and fittings that are over 2" nominal size shall be drawn to scale in a two-line format. Piping that is 2" and smaller may be shown with a single line representation. Use Standard District symbols, abbreviations and codes.
7. Piping Dimensions: Drawings shall contain complete piping dimensions for the fabrication of all piping sections over 2" nominal size. Dimensions shall be tiered, with the distance between flanges, tee centerlines and elbow centerlines shall be given on the outer dimension. Provide additional dimensions to the inside of this dimension in order to define the position of other process

connections or components. Provide a dimensional reference to a corner of the structure. Define the position of any wall, roof and floor penetrations with dimensions. Vertical dimensions may be given as elevations, in feet, to the nearest hundredth foot.

8. Drawings Material Lists: The "ITEM" column shall match the individual bubble call-outs. The "REQUIRED" column shall indicate exact quantities of major components. Provide lengths (rounded up) for pipe sizes 3" and larger. Quantities of minor components may be indicated with "AS REQD". The "description" column has the following required format:

Component, Size, Material, Ratings, Configuration(s), End Type  
Examples:

PIPE, 2", PVC, SCH 80  
FLANGE, 8", STL, 150 LB, SLIP-ON, FF  
ELBOW, 6", STL, STD WT, 45 DEG, BWE  
THREADED OUTLET, 1" NPT OUTLET X 12" RUN, STL, 3000 LB  
BALL VALVE, 1", BRONZE BODY, 150 LB, SST BALL, TFE SEATS,  
THRD

9. Equipment ID Tagging: Conform the equipment tagging system on P&IDs to Drawing 9492-G-006. Install equipment tags per Section 01 91 13.10, "Asset Identification Tags". Install piping identification per Section 22 05 53.05, "Pipe Identification".

## 1.6 SYSTEM DESCRIPTION

### A. General:

1. Provide equipment and parts that are suitable for stresses, which may occur during fabrication, transportation, erection, and operation.
2. Provide equipment that has not been in service prior to delivery, except as required by tests.
3. Like parts of duplicate units are to be interchangeable.
4. When 2 or more units of equipment for the same purpose are required, provide products of same manufacturer.
5. Equipment manufacturer's responsibility extends to selection and mounting of gear drive units, motors or other prime movers, accessories, and auxiliaries required for proper operation.
6. When necessary, modify manufacturer's standard product to conform to the specified requirements or requirements indicated on the drawings and contained in laws and regulations.

B. Material Requirements:

1. Materials: Suitable for superior corrosion resistance and for services under conditions normally encountered in similar installations.
2. Dissimilar Metals: Separate contacting surfaces with dielectric material.

C. Power Transmission Systems:

1. Power Transmission Equipment: V-belts, sheaves, shaft couplings, chains, sprockets, mechanical variable-speed drives, variable frequency drives, gear reducers, open and enclosed gearing, clutches, brakes, intermediate shafting, intermediate bearings, and U-joints are to be rated for 24 hour-a-day continuous service or frequent stops-and-starts intermittent service, whichever is most severe, and sized with a minimum service factor of 1.5.
  - a. Apply a 1.5 service factor to nameplate horsepower and torque of prime source of power and not to actual equipment loading.
  - b. Apply service factors higher than 1.5 when recommended for continuous 24 hour-per-day operation and shock loadings specified in AGMA 6010-E88, other applicable AGMA standards, or other applicable referenced standards.
  - c. When manufacturer recommends service factor greater than 1.5, manufacturer's recommendation takes precedence.

D. Vibration:

1. Resonant Frequency: Ensure there are no natural resonant torsional, radial, or axial frequencies within 25 percent above or below the operating rotational frequencies or multiples of the operating rotational frequencies that may be excited by the equipment design.
2. Design, balance and align equipment to meet the vibration criteria specified in individual equipment specification sections.

E. Equipment Mounting and Anchoring:

1. Mount equipment on cast iron or welded steel bases with structural steel support frames. Utilize continuous welds to seal seams and contact edges between steel members. Grind welds smooth.
2. Provide bases and supports with machined support pads, dowels for alignment or mating of adjacent items, adequate openings to facilitate grouting, and openings for electrical conduits.
3. Provide jacking screws in bases and supports for equipment weighing over 1,000 pounds.

4. Anchor equipment base to concrete pad. Determine number, size, type, and location of bolts, anchor bolts, or other connections.
5. Provide bolt sleeves for anchor bolts for heavy equipment. Adjust bolts to final location and fill sleeve with non-shrink grout per API 686-96, Machinery Installation and Installation Design (Recommended Practice).

F. Structural Design:

1. Design connections and related details for seismic design criteria as specified in Section 01 81 02.
2. For equipment or piping with operating weight of 400 pounds or more provide calculations for:
  - a. Determination of operating weight and centroid of equipment
    - 1) Operating weight is to be weight of unit plus weight of fluids or solids normally contained in unit during operation
  - b. Determination of seismic forces and overturning moments
  - c. Determination of shear and tension forces in connections
  - d. Design of connection details based on calculated shear and tension forces

G. Equipment Units Weighing 50 pounds or more: Provide with lifting lugs or eyes to allow removal with hoist or other lifting device.

## 1.7 SUBMITTALS

A. General:

1. The following submittal requirements are in addition to the submittal requirements specified under each individual technical specification section.

B. Product Data:

1. For each item of Equipment:
  - a. Design features
  - b. Load capacities
  - c. Efficiency ratings
  - d. Material designations by UNS alloy number and ASTM Specification and Grade
  - e. Data needed to verify compliance with the Specifications

- f. Catalog data
  - g. Name plate data
  - h. Clearly mark submittal information to show specific items, materials and accessories or options being furnished.
2. Gear Reduction Units:
- a. Engineering information per applicable AGMA standards
  - b. Gear mesh frequencies
- C. Shop Drawings:
1. Drawings for Equipment:
- a. Drawings that include outline drawings, cut-away drawings, parts lists, material specification lists, and other information required to substantiate that proposed equipment complies with specified requirements.
2. Outline drawings showing equipment, driver, driven equipment, pumps, seal, motor(s) or other specified drivers, variable frequency drive, shafting, U-joints, couplings, drive arrangement, gears, baseplate or support dimensions, anchor bolt sizes and locations, bearings, and other furnished components.
3. Installation and checkout instructions including leveling and alignment tolerances, grouting, lubrication requirements, and initial start-up procedures.
4. Wiring, control schematics, control logic diagrams and ladder logic or similar for computer based controls.
5. Recommended or normal operating parameters such as temperatures and pressures.
6. Alarm and shutdown set points for all controls furnished.
- D. Calculations:
1. Calculations and other information to substantiate base plates, supports, and anchor bolts meet minimum design strength requirements and seismic design criteria specified in Section 01 81 02.
2. Bearing L10 life calculations in accordance with ABMA 9 or ABMA 11 calculation methods for drivers, pumps, gears, shafts, motors, and other drive line components with bearings.
3. Calculations and other information to substantiate that operating rotational frequencies meet the requirements of this Section.



4. Torsional Analysis of Power Transmission Systems: When torsional analysis is specified in the equipment Sections, provide:
    - a. Sketch of system components identifying physical characteristics including mass, diameter, thickness, and stiffness.
    - b. Results of analysis including first and second critical frequencies of system components and complete system.
  5. Calculations for connection details demonstrating compliance with specified structural design requirements.
  6. Professional Engineer registered in the State of California is required to stamp and sign calculations.
- E. Quality Control Submittals:
1. Source quality control reports and certified test data as specified in Section 01 75 17.
  2. Submit factory test reports before shipment.
  3. Certified static and dynamic balancing reports for rotating equipment.
  4. Final field alignment values (signed and dated by journeyman millwright).
  5. Field quality control reports and test data as specified in Section 01 75 17.
  6. Start-up Plan: Proposed plan for field testing equipment as specified in Section 01 75 17.
  7. Certificate of Proper Installation: Provide as required in the individual technical specification sections.
  8. Submit material test reports as specified in the equipment sections.
  9. Submit NSF/ANSI 61 certification for all materials in contact with drinking water. If NSF certified before January 4, 2014 the material must be certified as meeting CA low lead requirement (NSF/ANSI 61 Annex G or NSF/ANSI 372).
    - a. Submit NSF 14 potable water certification for plastic piping and related materials in contact with drinking water.
  10. References: Provide references from a minimum of 3 installations currently operating the same model equipment in continuous service for a minimum of 2 years under similar operating conditions. Reference information shall include location, service, contact person, and contact phone number.

F. Operation and Maintenance Manuals:

1. Provide at project site complete and final manuals for use by field personnel and Engineer prior to equipment delivery to the site.
2. Include manufacturer and model number of every bearing; include calculated ball pass frequencies of the installed equipment for both the inner and outer raceways.
3. Include motor rotor bar pass frequencies.
4. Factory and Field Settings: Include a complete and detailed list of all final factory and field settings for all instruments and devices. Insert this information into the final O&M manuals when available. This information shall also be included in all electronic versions of the O&M manuals.

1.8 QUALITY ASSURANCE

A. Qualifications: Equipment manufacturer and system component manufacturers to have a minimum of 5 years' experience in the design, manufacture, and assembly of the specified equipment and components with an established record of successful operation of such equipment and components.

B. Manufacturer's Field Services:

1. Provide as required in the individual technical specification sections.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Equipment: Pack in boxes, crates, or otherwise protect from damage and moisture, dust, or dirt during shipment, handling, and storage.
  - a. Include vendors name, model number, and equipment tag number.
2. Bearings: Separately pack or otherwise suitably protect during transport in accordance with manufacturer's instructions.
3. Spare Parts: Deliver spare parts and deliver in boxes labeled with contents name, part number, equipment to which spare parts belong, and name of Contractor.

B. Storage:

1. Equipment Having Bearings: Store in enclosed facilities. Rotate units at least once per month or more often as recommended by the manufacturer to protect rotating elements and bearings.

2. Gear Boxes: Oil filled or sprayed with rust preventive protective coating.
- C. Protection:
1. Equipment: Protect equipment from deleterious exposure.
  2. Painted Surfaces: Protect against impact, abrasion, discoloration, and other damage.

#### 1.10 SEQUENCING AND SCHEDULING

- A. Equipment Anchoring: Obtain from equipment manufacturers' anchoring material and templates or setting drawings in time for anchors to be cast-in-place when concrete is placed.
- B. Coordinate details of equipment with other related parts of the work, including verification that structures, piping, wiring, and equipment components are compatible.
- C. General Start-up and Testing of Equipment:
1. Perform general start-up and testing procedures after operation and maintenance manuals for equipment have been received.
  2. Conduct functional testing of mechanical or electrical systems when each system is substantially complete and after general start-up and testing procedures have been successfully completed.
  3. Functional testing requirements as specified in Sections 01 75 17 and other individual equipment specification sections.

#### 1.11 MAINTENANCE

- A. Special Tools:
1. Provide any and all special tools required for operation and maintenance.
  2. Mark or tag and list such tools in maintenance and operations instructions. Describe use of each tool.
- B. Spare Belts:
1. When spare belts are specified, furnish a minimum of 1 spare belt for every different type and size of belt-driven unit, unless otherwise indicated.
    - a. Where 2 or more belts are involved, furnish matched sets.
    - b. Identify as to equipment, design, horsepower, speed, length, sheave size, and use.

c. Package in boxes labeled with identification of contents.

C. Spare Parts:

1. Assume responsibility until turned over to District.
2. Store in enclosed facilities.
3. Furnish itemized list and match identification tag attached to every part.
4. List parts by generic title and identification number.
5. Furnish name, address, and telephone number of supplier and spare parts warehouse.

1.12 SERVICE CONDITIONS

- A. Treated Water (Potable) Chemistry: Unless otherwise noted materials that contact water covered by this specification will be subjected to water that promotes galvanic corrosion. Materials and coatings shall be suitable for soft water (less than 50 ppm total dissolved solids) with pH from 6.5 to 9.5 and maximum total chlorine residual of 2.5 ppm (in chloramine form). The presence of chloramines in the water shall not have any effect on the manufacturer's warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General:

2.2 FABRICATION

- A. Nameplates:

1. Engraved or stamped on Type 304 or 316 stainless steel and fastened to equipment at factory in an accessible and visible location.
2. Indicate following information as applicable:
  - a. Manufacturer's name
  - b. Equipment model number and serial number
  - c. Maximum and Normal rotating speed
  - d. Horsepower
  - e. Rated capacity
  - f. Service class per applicable standards

3. Nameplates for Pumps: Include:
    - a. Rated total dynamic head in feet of fluid
    - b. Rated flow in gallons per minute
    - c. Impeller, gear, screw, diaphragm, or piston size
  4. Gear Reduction Units: Include:
    - a. AGMA Class of service
    - b. Service factor
    - c. Input and output speeds
- B. Bolt Holes in Equipment Support Frames: Do not exceed bolt diameter by more than 25 percent, up to limiting maximum diameter oversize of 1/4-inch.
- C. Coating:
1. Provide factory and field finish coatings with the system and color specified on the “Finish, Coating and Color Schedule” on the Drawings.

## 2.3 OILS, GREASE AND LUBRICANTS

- A. All oils, grease and lubricants used in association with potable water equipment shall be suitable for the intended service and NSF approved for potable water service.
- B. Acceptable Products:
1. Wise Solutions (<http://www.wisesolutions.net/index.php/>)
  2. Renewable Lubricants ([www.renewablelube.com](http://www.renewablelube.com))
  3. Or equal as approved by the Engineer

## 2.4 RUST INHIBITOR

- A. Carbon steel flange faces shall be coated with a lubricant or rust inhibitor conforming to an NSF 116-2000 class H1 (acceptable for incidental food contact) as approved by the Engineer. This inhibitor shall be applied only after application and curing of all other coatings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Inspect all components for shipping damage, conformance to specifications, and proper torques and tightness of fasteners.

### 3.2 PREPARATION

- A. Metal Work Embedded in Concrete:

1. Accurately place and hold in correct position while concrete is being placed.
2. Clean surface of ferrous metal in contact with concrete immediately before concrete is placed.
3. Embedded metal shall not touch rebar unless otherwise directed by the design documents.

- B. Concrete Surfaces Designated to Receive Grout:

1. Give surfaces heavy sandblasting treatment.
2. Clean surfaces of sandblasting sand, grease, oil, dirt, and other foreign material that may reduce bonding of grout.
3. Concrete Saturation: Saturate concrete with water. Concrete surface shall be damp concrete at time grout is placed.

### 3.3 FIELD MEASUREMENTS:

- A. Prior to fabrication of equipment, take measurements for installation of equipment and verify dimensions indicated on the drawings. Ensure equipment and ancillary appurtenances fit within available space. Tolerance for horizontal and vertical positioning of equipment shall be within 0.03' of the dimensions shown on the drawings, unless otherwise shown.

- B. Piping positioning tolerances shall be per Section 40 20 20.

- C. Positioning accuracy:

1. Horizontal, vertical elevation and true plumb positioning of mechanical equipment, including pump mounting fabrications like pump barrels and sole plates, shall be accurate within:
  - a. Horizontal & vertical: 0.03ft at a 95% confidence level
  - b. Plumb: 30 arc-seconds at a 95% confidence level

2. Accuracy shall be determined relative to the project survey control established by District Survey and to the corners of the structure(s).
3. The use of string lines and measuring tapes is not acceptable for final positioning.

### 3.4 INSTALLATION

- A. Install diesel tanks, tank monitoring systems, and accessories in accordance with manufacturer's installation instructions and recommendations, and the related specification sections.
- B. Install and commissioning of piping: In accordance with Section 40 20 20 – Mechanical Piping
- C. Lubrication Lines and Fittings:
  1. Lines from Fittings to Point of Use: Support and protect.
  2. Fittings:
    - a. Bring fittings to outside of equipment in manner such that they are readily accessible from outside without necessity of removing covers, plates, housings, or guards.
    - b. Fittings shall have a minimum of 18-inches clear space directly in front of the fitting for easy grease-gun access.
    - c. Mount fittings together wherever possible using factory-mounted multiple fitting assemblies securely mounted, parallel with equipment lines, and protected from damage.
    - d. .
- D. Grouting Equipment Bases:
  1. Comply with manufacturer's installation instructions and API Recommended Practice 686 Latest Edition, for grouting spaces, and tolerances for level and alignments, both vertical and horizontal.
  2. Grout base when piping connections are complete and in alignment with no strain transmitted to equipment.
  3. Grout base when equipment is leveled and in alignment.
  4. Epoxy Grout: As specified in Section 03 60 00 – Grouting
- E. Special Techniques: Use applicable special tools and equipment, including precision machinist levels, dial indicators, and gauges as required in equipment installations.

- F. When existing mechanical connections are dismantled to facilitate prosecution of the Work, Contractor shall remove and properly dispose of existing gaskets and replace in kind, except for gaskets that are in contact with drinking water. Gaskets in contact with drinking water shall be in accordance with Article 2.1 – MATERIALS specified hereinbefore.

3.5 EBMUD FIELD CALIBRATION TAGS

- A. Complete and install Field Calibration Tags on all instruments, pilot valves, relief valves, and other devices with ranges, setpoints, deadbands, and/or offsets. Record the verified settings on the EBMUD Field Calibration Tag with a black extra-fine point black permanent marker and affixed to the instrument with an 18 lb nylon cable tie. The Engineer shall witness the process. The blank tags are furnished by the District. Below is an example of the blank tag:

**EBMUD**

## Field Calibration Tag

Equipment Tag ID: \_\_\_\_\_

Input: LRV= \_\_\_\_\_ URV= \_\_\_\_\_ Units= \_\_\_\_\_

Output(scale): LRV= \_\_\_\_\_ URV= \_\_\_\_\_ Units= \_\_\_\_\_

Setpoints: 1= \_\_\_\_\_ 2= \_\_\_\_\_ Units= \_\_\_\_\_

Deadband= \_\_\_\_\_ Offset= \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

Technician: \_\_\_\_\_ Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

B. Definitions:

1. Deadband: The area of a signal range where no action occurs to prevent oscillation or repeated activation-deactivation cycles (“hunting”).
2. Offset: A value entered to compensate for mounting position or other effects. For pressure transmitters, this is typically compensation for the difference in the mounted elevation of the transmitter relative to the centerline elevation of the process pipe. For tank level measurements, the offset is the difference in the mounted elevation of the transmitter relative to the elevation of the bottom of the tank.
3. LRV = Lower Range Value
4. Setpoints: The desired value specified on the P&ID for controlling a system. Dual switches will have two.



5. Units: The engineering units used, including: mA, gpm, psig, ft-H<sub>2</sub>O, deg F, etc.
6. URV = Upper Range Value

### 3.6 FIELD QUALITY CONTROL

- A. Test equipment as specified in Section 01 75 17 and the individual specification technical sections.

END OF SECTION

## SECTION 33 56 13.13

### ABOVEGROUND DIESEL FUEL STORAGE TANKS AND ACCESSORIES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section includes: Provide, complete, diesel fuel storage tank, diesel fuel maintenance system, diesel fuel pipe leak-detection system, as specified herein and as shown on the drawings.
- B. Related sections:
  - 2. Section 01 75 17 – Field Testing and Startup
  - 3. Section 01 79 00 – Demonstration and Training
  - 4. Section 01 91 13.10 – Asset Identification Tags
  - 5. Section 26 05 00 – Common Work Results for Electrical
  - 6. Section 33 12 01 – Basic Mechanical Materials and Methods

##### 1.2 SUBMITTALS

- A. Submit the following prior to fabrication:
  - 1. Dimensional drawings, catalog information, and materials of construction for tanks, pumps, motors, valves, strainers, instruments, panels, and other accessories
  - 2. Control panel internal schematic (elementary) wiring diagrams
  - 3. Control Panel point-to-point interconnection wiring diagrams
- B. Submit the following prior to testing:
  - 1. Manufacturer's Certificate of Proper Installation
- C. Submit the following prior to contract completion:
  - 1. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers' catalog information. Indicate valve data and ratings.
  - 2. Shop Drawings: Indicate tanks, system layout, pipe sizes, location, and elevations. For fuel oil tanks, indicate dimensions and accessories including manholes and hold down straps.

3. Certificates: Certify that products meet or exceed specified requirements.
4. Project Record Documents: Record actual locations of piping system, storage tanks, and system components.
5. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
6. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
7. Certified Field Test Reports

1.3 OPERATION AND MAINTENANCE (O&M) MANUALS

A. Provide the following:

1. Provide a copy of the equipment manufacturer's warranties.
- 

PART 2 - PRODUCTS

2.1 EQUIPMENT SUMMARY TABLE

Table A Diesel Fuel System	
Equipment ID	Description
505.20-SPS-TNK-021	Aboveground diesel fuel tank
505.20-SPS-FMS-021	Fuel monitoring system

2.2 SERVICE CONDITIONS

A. Service: No. 2 Diesel Fuel Oil

2.3 ABOVEGROUND DIESEL FUEL STORAGE TANK

A. Supplied by District

B. The tank is constructed and listed in accordance with Underwriters Laboratories Inc. Standard 2085 for Insulated Secondary Containment Aboveground Tanks for Flammable and Combustible Liquids, Protected Type. This 2 Hour fire rating shall exceed all requirements of The National Fire Protection Association Sections 30 and 30A for “fire resistant” tanks and meet the requirements of The Uniform Fire Code Articles 52 and 79, Appendix II-F and Appendix Standard A-II-F-1 for “protected” aboveground tanks.

- C. The tanks shall have Certification from CARB for Phase I and II Vapor Recovery.
- D. Note: If tank is required to have CARB certification in accordance with Executive Order VR-302-B, "Standing Loss Control Vapor Recovery System for New Installations of Aboveground Storage Tanks, then all tanks less than 1,000 gallons in capacity will be fabricated with 6" of insulating material and will be painted white.
- E. The anchoring tie downs shall be welded to the bottom of the secondary tank and meet Zone 4 Seismic requirements.
- F. The tanks must be off-loaded on site with a crane.
- G. All openings shall be from the top, with threaded NPT risers.
- H. The tank to include a Warranty for 30 years, see warranty documents.
- I. The tank manufacturer shall provide proof of a minimum 10 years of manufacturing vault tanks.
- J. PRIMARY STORAGE TANKS:
  - 1. The standard primary storage tank shall be rectangular in design. It shall be constructed of UL 142 specified steel thickness, with continuous welds.
  - 2. The primary storage tank shall be constructed of optional ASTM A-569 or A-36 carbon steel, or ASTM A-240 type 304 or 316 stainless steel, as required for compatibility of product being stored.
  - 3. The primary storage tank shall be constructed and listed in accordance with UL 142 Standards.
  - 4. The primary tank shall be fitted with: a 4" or 6" Fill Port, a 2" Normal Vent Port, either a 4", 6", 8", or 10" Emergency Vent Port, a 2" Liquid Gauging Port, a 2" Port for Dispensing Pump, a 4" Phase I Vapor Recovery Port, and a 18" manway (for tanks with capacities 5,000 gallons and greater). An optional 15-gallon Spill Containment with Lockable Lid and Drain Port to the primary tank is available.
  - 5. The primary tank shall be pressure tested to UL 142 Standard (minimum 3 to maximum 5 psi) at the factory and shall be field tested by the contractor to a maximum 3 psi.
  - 6. The primary steel tank shall be designed to store M85 (methanol), alcohol and petroleum blends.
- K. FIRE PROTECTION:

1. The standard fire protection material shall be lightweight concrete and surround the primary tank. The tank design shall provide a minimum two (2) hour fire rating per UFC Appendix Standard A-II-F (formerly UFC 79-7), and UL 2085 Protected Secondary Containment Tanks.
2. The fire protective material shall allow liquid leaking from the primary tank to penetrate the material and communicate with the leak detection tube according to UL 2085 Protected Secondary Containment Tanks.
3. The fire protective material shall be of a monolithic pour, poured at the factory.
4. The fire protective material shall provide a minimum of an R-10 insulating factor.

L. BULLET RESISTANCE:

1. The fire protected primary tank shall be tested by a qualified engineering firm to be resistant to penetration of the primary tank by a 150 grain, M 2 Bullet, traveling at a velocity of at least 2700 feet per second, when fired from a .30 caliber rifle, located a maximum of 100 feet from the target.
2. The fire protected tank must be able to be repaired in the field by a factory representative, when impacted by a bullet.
3. The factory representative must be able to certify that the primary and secondary containment do not leak, and that the fire protective material regains its minimum two (2) hour protection.

M. SECONDARY LEAK CONTAINMENT TANK:

1. The secondary leak containment tank shall be rectangular in design and listed according to UL 2085 insulated secondary aboveground tanks for flammable and combustible liquids, protected type.
2. The secondary tank shall be tested liquid tight at the factory (minimum 3 to maximum 5 psi) and shall also be field tested by the contractor to a maximum 3 psi.
3. The secondary tank shall provide reinforcement for the lightweight concrete to remain in place around the primary tank.
4. The secondary tank shall provide true 360° Radius “pressure testable” containment for the primary tank.
5. The secondary tank shall be fitted with a 2” Annular Space Monitoring Tube, a 2-inch Normal Vent Port and either a 4”, 6”, 8” or 10” Emergency Vent Port, in addition to openings for all ports in the primary tank.

6. The port openings in the top of the secondary tank shall be constructed with full welds to prevent moisture from seeping between the fire proofing material and secondary and primary tanks.
7. The top of the secondary tank shall be sloped so that water will not accumulate on top of the tank.
8. The secondary tank shall have a two (2) inch monitoring port including a tube which provides a means to detect product leakage from the primary tank into fire protection material that directly surrounds the primary tank. This design shall be listed under UL 2085.

COATINGS:

9. The exterior surface of the secondary tank shall be cleansed of foreign material and coated with a corrosion resistant industrial paint (3 to 5 mils dry film thickness).
10. The standard color shall be white and comply with CARB Standing Loss regulations.
11. Note: Per section 1.5, if the tank is less than 1,000 gallons and needs to have CARB certification, the tank will be painted white. This requirement is only applicable to tanks storing gasoline in the state of California.
12. The total dry thickness shall be a minimum of 1/8 inch.
13. All threaded openings and flanges shall be protected during the coating process.
14. The coating shall be applied only when the work area and the secondary steel tank are between the temperatures of 32° and 103° F.
15. The standard color shall be desert sand.
16. The coating shall provide a 10-year warranty.
17. Filler Cap: 3 inch (75 mm) watertight brass with lock, recessed box and cover.
18. Gauge: Remote reading, electronic, for two-wire, 24 volt power, with wall mounted direct reading gauge.
19. Capacity:
  - a. Volume: 2,000 gallons.
20. Tank Fittings: (mm).

21. Connections: UL 567, dielectric bushings.
  22. Manway: 48 inch (1220 mm) diameter, with cover and gasket, and extension sleeve; located at top of tank.
- N. Signage: Provide signage as required by local authority having jurisdiction.
- O. Acceptable products:
1. ConVault
  2. Hoover
  3. Or equal as approved by the Engineer

#### 2.4 DAY TANK

A. Provided by District

B. Acceptable products:

1. Pryco, Inc.
2. Pryco UL-142 listed 50-gallon day tank with rupture basin.
3. Day tank – Standard – 50-gallon, U/L listed Control Voltage, 120VAC Dry
4. Contacts. This tank is for indoor use only supply / return fuel system, includes:
5. (201) Alarm, Combination - High/Low Fuel Level.
6. (211) Alarm Relay - For remote signal of option #210.
7. (322A) Vent Kit with caps and fittings, single wall, 2" NPT.
8. (334-3) Cover NEMA-1 Triplex Pumps and Motors.
9. (355A) Check Valve – Pump Intake, 1/2-inch NPT (Return).
10. (360A-120) Solenoid Valve - N/C – 1/2-inch NPT, 120VAC (Supply).
11. (385/04) Rupture Basin – 150% Tank Capacity, 50-gallons.
12. (395) Rupture Basin – Alarm and P/M Shut Down (Remote Contacts).
13. (399-1-05) Reverse Flow Controls and Piping – 1/2-inch plumbing.
14. (4101V-REV) Pump – Cast Iron, 4 GPM – Reverse Flow.

15. (414) Motor – 1 Phase – 1/3 HP, 115VAC, 60 Hz Motor (Supply)

16. (544) Enclosure – Control Panel, NEMA-1.

## 2.5 TANK MONITORING AND LEAK DETECTION SYSTEM:

A. Provided by District.

B. General: Provide a multi-channel alarm system to monitor discrete diesel fuel levels in a double-walled fuel storage tank. The system shall utilize a central electronic control panel and remote sensors to provide local and remote continuous level indication and discrete level alarms.

1. Acceptable manufacturers:

- a. Veeder-Root TLS\_450 Plus tank monitor console with printer and application software.
- b. Veeder-Root Magnostriuctive Level Probe with float and cap and ring kit.
- c. Veeder-Root Annular Sensor for steel tanks.
- d. Veeder-Root Sump Sensor
- e. Veeder-Root Overfill Acknowledgement Switch
- f. Veeder-Root Overfill Alarm
- g. Or equal as approved by the Engineer

## 2.6 PIPING AND FITTINGS

A. Regulatory Requirements:

1. Comply with the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
2. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation of fuel oil system.
3. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

B. Comply with the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.

C. Carbon Steel Pipe:



1. Comply with One of the Following:
2. End Connections:
  - a. Forged, socket weld type, complying with ASTM A182/A182M and ASME B16.11 for pipe or fittings less than 2-1/2 inch (65 mm).
  - b. Threaded type complying with ASME B16.3, Class 150 or ASME B16.11.
- D. Reinforced Thermosetting Resin Plastic (RTRP) Pipe: ASTM D2310 and ASTM D2996, UL listed filament wound fiberglass reinforced epoxy pipe with integral epoxy liner and exterior coating.
  1. Fittings: Compression molded, filament wound fiberglass reinforced epoxy.
  2. Joints: Tapered bell and spigot adhesive bonded
- E. Exterior Containment Piping System: Factory fabricated, double-wall complying with ASME B31.3 and NFPA 30.
  1. Physical Characteristics:
    - a. Fiberglass reinforced plastic (FRP) complying with ASTM D5677.
    - b. Chemically compatible with type of fuel handled.
    - c. Non-corrosive.
    - d. Dielectric.
    - e. Non-biodegradable.
    - f. Microbial resistant.
    - g. Pressure Limitation: Capable of withstanding 5 psig (35 kPa) minimum air pressure.
  2. Design Characteristics:
    - a. Piping and support allow for drainage.
    - b. Allows for complete inspection of the product piping prior to sealing of containment piping.
    - c. Pipe Supports:

- 1) Design based on pipe size, pipe weight, fuel weight, and operating condition to evenly separate containment piping from product piping.
  - 2) Construct of same material as product piping.
  - 3) Design supports so no point loading occurs on the primary or exterior pipe.
  - 4) Permanently attach supports to product pipe by tack welding or adhesive.
  - 5) Design to allow for pipe movement of both product piping and exterior containment piping without causing damage to either.
3. Product Pipe: Provide product pipe as indicated on drawings and specified in this Section.

## 2.7 FLANGES, COUPLINGS, AND PIPING COMPONENTS

### A. Flanges:

1. Provide flanged end connections on equipment, fittings, piping, piping components, adapters, couplings, and valves complying with ASME B16.5, Class 150.
2. Stainless Steel: Comply with ASTM A182/A182M, Grade F304 or F304L, forged type.
3. Gaskets, Non-Isolating:
  - a. 1/8 inch (3.2 mm) thick.
  - b. Comply with ASME B16.12, raised-faced type.
  - c. Material: Buna-N.

### B. Gaskets, Electrically Isolating:

1. Comply with ASTM D229.
2. Electrical Insulating Material: 1000 ohms resistance.
3. Chemically compatible with fuel handled.
4. Full face type.
5. Provide full surface, spiral-wound, mylar, insulating sleeves between bolts and holes of flanges.

6. Furnish bolt shank diameter not less than diameter at root of threads.
7. Provide high-strength 1/8 inch (3.2 mm) thick, phenolic, insulating washers next to flanges with flat, circular, stainless steel washers over the insulating and under bolt heads and nuts.
8. Supply adequate bolt length to accommodate insulating gaskets and stainless steel washers.

C. Bolts, Nuts, and Washers:

1. Comply with ASME B18.2.1 and ASME B18.2.2.
2. Bolts:
  - a. Regular hexagonal type.
  - b. Threaded in accordance with ASME B1.1, Class 2A fit, Coarse Thread Series, for sizes 1 inch (25 mm) and smaller and Eight-Pitch Thread Series for sizes larger than 1 inch (25 mm).
  - c. Provide sufficient length to obtain full bearing on nuts, projecting no more than two full threads beyond nuts with bolts tightened to required torque.
3. Nuts:
  - a. Hexagonal, heavy series type.
  - b. Threaded in accordance with ASME B1.1, Class 2B fit, Coarse Thread Series for sizes 1 inch (25 mm) and smaller and Eight-Pitch Thread Series for sizes larger than 1 inch (25 mm).

D. Piping Components:

1. Provide components that meet the material, fabrication, and operating requirements of ASME B31.3, except as modified herein.
2. Pressure Design Class: Class 150 as defined in ASME B16.5.

## 2.8 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
- B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch (15 to 40 mm): Malleable iron, adjustable swivel, split ring.

C. Hangers for Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.

## 2.9 BALL VALVES

A. Manufacturers:

1. Morrison Bros: [www.morbros.com](http://www.morbros.com).
2. Or equal as approved by the Engineer.

B. MSS SP-110, Class 150, 400 psi CWP (Class 150, 2760 kPa CWP), bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder.

## 2.10 FLEXIBLE CONNECTORS

A. Manufacturers:

1. Flex-ing - Franklin Fueling System: [www.franklinfueling.com](http://www.franklinfueling.com).
2. Or equal as approved by the Engineer.

## 2.11 EQUIPMENT TAGS

A. Provide equipment tags per Section 01 91 13.10 – Asset Identification Tags.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions, applicable codes, and the project drawings.
- B. Finish Paint: Finish paint of equipment and piping shall be the system and color as designated on the "Finish, Coating and Color Schedule" on the Drawings.

### 3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### 3.3 PIPING INSTALLATION

A. Install in accordance with manufacturer's instructions and API RP 1615

- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals. Install to NACE SP0286.
- C. Route piping in orderly manner and maintain gradient.
- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance for installation of insulation and access to valves and fittings.

#### 3.4 FUEL TANK INSTALLATION

- A. Install tanks in accordance with manufacturer's instructions and API RP 1615. Contractor to provide installation documentation as required by AST and Day Tank, and monitor system manufacturer.
- B. Provide piping connections to tanks with unions and swing joints. Provide venting to API Std 2000.
- C. Perform tank tests and obtain inspections as required by Contra Costa County Fire Department permit conditions Contractor is responsible for scheduling inspections and being on site for all required inspections.
- D. Installer shall possess current ICC, International Code Council certifications for the work to be performed. Installer shall also possess manufacturer's certification for tank and monitor components. Contractor shall provide ICC certifications for the employees involved in the field installation.

#### 3.5 FIELD TESTING

- A. Functional Test: The contractor, assisted by the manufacturer's field representative, shall conduct functional tests in accordance with Section 01 75 17.
- B. Performance Test: The Contractor shall perform performance tests as specified in Section 01 75 17.

END OF SECTION