

**CITY OF PETALUMA
PETALUMA, CALIFORNIA**

**CONTRACT DOCUMENTS FOR
HARDIN LANE TANK RECOATING PROJECT
C67502328**

(Notice Inviting Bids, Instructions to Bidders, Bid Forms, General Conditions,
Special Provisions, Technical Specifications, Construction Agreement,
Bond Forms, Project Drawings)

CITY PROJECT NO. C67502328

CITY OF PETALUMA - SONOMA COUNTY - CALIFORNIA

Questions concerning interpretation of improvement plans, special provisions,
contract documents and bid items shall be directed to:

***Department of Public Works and Utilities
202 N. McDowell Boulevard
Petaluma, CA. 94954
Phone: (707) 778-4546 Fax: (707) 206-6034***

Attention: Dan Herrera

Office Hours: Monday thru Thursday - 8:00 to 5:00 p.m.
Friday – 8:00 to 4:00 p.m.

Bid Opening: Thursday May 23, 2024 at 2:30 p.m.

CITY OF PETALUMA
PETALUMA, CALIFORNIA

HARDIN LANE TANK RECOATING PROJECT

CITY PROJECT NO. C67502328

CITY OF PETALUMA - SONOMA COUNTY - CALIFORNIA



Prepared by:

A black ink signature of Dan Herrera, consisting of a stylized, bold script.

Dan Herrera, P.E. C77596

4/25/2024

Date

A blue ink signature of M. Sean Jeane, consisting of a stylized, cursive script.

M. Sean Jeane, P.E. C52402

April 25, 2024

Date

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NOTICE INVITING BIDS

1. **RECEIPT OF BIDS:** Sealed Bids will be received at the office of the City Clerk of the City of Petaluma located at 11 English Street, Room 4, Petaluma, CA 94952-2610, until 2:30 PM (enter time) on Thursday, May 23rd, 2024, for the Hardin Lane Tank Recoating Project C67502328. Any Bids received after the specified time and date will not be considered. Fax and other electronically transmitted Bids will not be accepted.
2. **OPENING OF BIDS:** The Bids will be publicly opened and read at 2:30 PM (enter time) on Thursday, May 23, 2024 at the above-mentioned office of the CITY. The CITY reserves the right to postpone the date and time for opening of Bids at any time prior to the aforesaid date and time.
3. **COMPLETION OF WORK:** The WORK must be completed with 90 working days after the commencement date stated in the Notice to Proceed.
4. **DESCRIPTION OF WORK:** The WORK includes The work generally includes removing all interior and exterior tank coatings, preparing all steel surfaces, and recoating per the specifications. Tank improvements will include the addition of steel handrailing on the roof, new roof vents, replacement of the level indicator, replacement of the interior ladder, replacement of roof rafter ties and minor piping improvements. Control and isolation valves will be replaced in the valve vault next to the tank. Electrical work will include a new electronics cabinet, intrusion switches and site lighting.
5. **SITE OF WORK:** The site of the WORK is located: 1,750 feet down Hardin Lane, Petaluma, CA.
6. **OBTAINING CONTRACT DOCUMENTS:** The Contract Documents are entitled "Hardin Lane Tank Recoating Project C67502328".

The Contract Documents may be obtained by 4:00 P.M., Monday through Thursday at the office of Public Works & Utilities, 202 North Mc Dowell Boulevard, Petaluma, CA 94954.

If you would like to receive the bid document via the CITY's website, at no cost, please go to:

- <https://cityofpetaluma.org/bid-opportunities-2/>
- Fill out the Plan Holder's form by clicking on the Plan Holder's form link
- Fill in all fields
- Click on the submit button at the end of the form

Submit the Plan Holder's form on-line automatically puts you on the CITY's Bidders List and you will be notified of any Addendums or information pertaining to the bis by email.

If you would like to purchase bid documents, please call Phone No. 707-778-4548, Attention: Tiffany Avila, upon payment of \$25.00 (non-refundable) for each set of Contract Documents (including technical specification and accompanying reduced scale drawings).

The scale of the reduced drawings is about one-half of the original scale. At the Bidder's request and expense, the Contract Documents may be sent by overnight mail.

- Full-scale drawings are not available.
- If full-scale drawings are available and desired, they may be purchased at reproduction cost from Digitech, 1340 Commerce St., Suite K, Petaluma, CA.

94954, (707) 769-0410.

- 7. BID SECURITY:** Each Bid shall be accompanied by a certified or cashier's check or Bid Bond executed by an admitted surety in the amount of 10% percent of the Total Bid Price payable to the City of Petaluma as a guarantee that the Bidder, if its Bid is accepted, will promptly execute the Agreement. A Bid shall not be considered unless one of the forms of Bidder's security is enclosed with it. Upon acceptance of the Bid, if the Bidder refuses to or fails to promptly execute the Agreement the Bidder's security shall be forfeited to the CITY.
- 8. CONTRACTOR'S LICENSE CLASSIFICATION:** In accordance with the provisions of California Public Contract Code Section 3300, the CITY has determined that the CONTRACTOR shall possess a valid Class A or C-33 license at the time that the Contract is awarded. Failure to possess the specified license shall render the Bid as non-responsive and shall act as a bar to award of the Contract to any bidder not possessing said license at the time of award pursuant to labor Code Section 1725.5, subject to limited legal exceptions.
- 9. PREFERENCE FOR MATERIAL:** Any specification designating a material, product, thing, or service by specific brand or trade name, followed by the words "or equal" or "or equivalent" is intended only to indicate quality and type of item desired. Substitute products will be considered prior to award of the Contract in accordance with Section 3400 of the California Public Contract Code. The Bidder will submit data substantiating its request for a substitution of "an equal" item within 14 days following submission of its Bid. Substantiation date will conform to the requirements of the instructions for Proposed Substitutions of "or equal" items contained in the bid Forms. The ENGINEER will make a determination of approval or rejection of the proposed substitution prior to the award of the Contract. No request for substitution of "an equal" items will be considered by the ENGINEER after award of the Contract. This provision does not apply to materials, products, things, or services that may lawfully be designated by a specific brand or trade name under Public Contract Code Section 3400(c).
- 10. REJECTION OF PROPOSALS:** The CITY reserves the right to reject all or any part of all bids submitted, waive informalities and irregularities, and will not, to the extent allowed by law, be bound to accept the lowest bid.
- 11. BIDS TO REMAIN OPEN:** The Bidder shall guarantee the total bid price for a period of 90 calendar days from the date of bid opening.

12. CALIFORNIA PREVAILING WAGE RATE REQUIREMENTS: In accordance with the provisions of California Labor Code Sections 1770,1773, 1773.1, and 1773.7 as amended, the Director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages in accordance with the standards set forth in Section 1773 for the locality in which the WORK is to be performed. A copy of said wage rates is on file at the office of the City Clerk and is available to any interested party upon request. A copy of the prevailing rate of per diem wages are also online at <http://www.dir.ca.gov/DLSR>. Each Contractor and Subcontractor must pay no less than the specified rates to all workers employed to work on the Project. The schedule of per diem wages is based upon a working day of eight hours. The rate for holiday and overtime work must be at least time and one-half. It shall be mandatory upon the CONTRACTOR to whom the WORK is awarded and upon any subcontractor under the CONTRACTOR to pay not less than said specified rates to all workers employed by them in the execution of the WORK. The Contract will be subject to compliance monitoring and enforcement by the Department of Industrial Relations under labor Code Section 1771.4. Additionally, CONTRACTOR shall post job sit notices s required by Labor Code section 1771.4.

13. LABOR COMPLIANCE PURSUANT TO CALIFORNIA LABOR CODE §1771.1: A contractor of subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirement of Section 4104 of the Public Contract Code or engage in the performance of any contract for public work, as defined in Division 2, Part 7, Chapter 1 of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time contract is awarded.

14. RETAINAGE FROM PAYMENTS: The CONTRACTOR may elect to receive 100 percent of payments due under the Contract Documents from time to time, without retention of any portion of the payment by the CITY, by depositing securities of equivalent value with the CITY in accordance with the provisions of Section 22300 of the Public Contract Code. Alternatively, the CONTRACTOR may request, and the CITY shall make payment of retentions earned directly to the escrow agent at the expense of CONTRACTOR. At the expense of the CONTRACTOR, the CONTRACTOR may direct the investments of the payments into securities and the CONTRACTOR shall receive the interest earned on the investments upon the same terms as provided in Section 22300 of the Public Contract Code for securities deposited by the CONTRACTOR. The CONTRACTOR shall be responsible for paying all fees for the expense incurred by the escrow agent in administering the escrow account and all expenses of the CITY. These expenses and payment terms shall be determined by the CITY's Finance Director or their designee and the escrow agent. Upon satisfactory completion of the WORK, the CONTRACTOR shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the CITY, pursuant to the terms of Section 22300 of the Public Contract Code. Such securities, if deposited by

the CONTRACTOR, shall be valued by the CITY, whose decision on valuation of the securities shall be final. Securities eligible for investment under this provision shall be limited to those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters or credit, or any other security mutually agreed to by the CONTRACTOR and the CITY.

15. PAYMENT BOND: Pursuant to and in accordance with California Civil Code Section 9550, a payment bond must be filed if the expenditure for the WORK is in excess of Twenty-Five Thousand Dollars (\$25,000.00).

16. PRE-BID CONFERENCE VISITS: [At least one box below MUST be checked]

- Check if no pre-bid conference/site is to be held.
- Mandatory pre-bid conference/site visit to be held: Prospective bidders are required to attend a mandatory pre-bid conference/site visit at *(enter time)* on _____, at the _____, offices at _____. Prospective bidders that fail to attend the mandatory pre-bid conference/site visit will be ineligible to bid on the project. Following the conference at City offices, City staff and prospective bidders will meet at the project Site.

Transportation to the project site will be the responsibility of prospective bidders. The purposes of the conference/site visit are to discuss the scope of the project and bidding requirements and to acquaint bidders with Site conditions.

No information communicated at the pre-bid conference/site visit may amend the project bidding requirements. Project bidding requirements may only be amended by addenda issued by authorized City officials. Following the pre-bid conference/site visit, prospective bidders may submit detailed technical questions in writing. If warranted, the City may respond to such questions by addenda.

- Non-Mandatory pre-bid conference/site visit to be held: Prospective bidders are invited to attend a non-mandatory pre-bid conference/site visit at *(enter time)* on _____ at the _____. Following the conference City offices, City staff and prospective bidders will meet at the project Site. Transportation to the project site will be the responsibility of prospective bidders. The purposes of the conference/site visit are to discuss the scope of the project and bidding requirements, and to acquaint bidders with Site conditions.

No information communicated at the pre-bid conference/site visit may amend the project bidding requirements. Project bidding requirements may only be amended by addenda issued by authorized City officials. Following the pre-bid conference/site visit, prospective bidders may submit detailed technical questions in writing. If warranted, the CITY may respond to such questions by addenda.

17. PROJECT ADMINISTRATION: All communications relative to the WORK shall be directed to the ENGINEER prior to opening of the Bids.

18. FINDING OF SUBSTANTIAL COMPLEXITY: Pursuant to Public Contract Code Section 7201(b)(3) the CITY's Public Work's Director has found that the WORK is substantially complex due to: the amount of technical and scientific knowledge needed to complete the project; the amount of resources needed to complete the project including amount of days, workers, and labor; the urgency for project completion; the amount of tasks needed to complete the project; the number of organizational stakeholders needed to satisfy; the environmental complexity of the conditions; and in particular the specialty contractor work and skills needed to complete the project (multidisciplinary components such as electrical, mechanical, instrumentation and controls, and structural; requires special skills and equipment to perform steel tank welding and coating); the size and impact of the project (1-million gallon tank); and therefore this is a unique project that is not regularly performed and requires a higher retention amount than 5 percent.

Notwithstanding Public Contract Code Section 7201 or any other law or regulation that purports to provide otherwise, public contracting is a quintessential municipal affair, subject to charter cities' home rule power, and the California Constitution grants charter cities supreme authority over municipal affairs, which include public Works, procurement, and the mode of municipal contracting (See, Public Contract Code Section 1100.7 and e.g., *Bishop v. City of San Jose* (1969) 1 C3rd 56), and it is the courts, not the legislature, that determines which matters are municipal affairs (see, e.g., *California Federal Savings and Loan v. City of Los Angeles* (1991) 54 C3d 1); and

Article X, Section 67 of the Petaluma Charter provides in pertinent part:

...no progressive payments can be provided for or made at any time which, with prior payments, if there have been such, shall exceed in amount at that time ninety percent of the value of the labor done and the materials used up to that time, and no contract shall provide for or authorize or permit or permit the payment of more than ninety percent of the contract price before the completion of the work done under said contract and the acceptance thereof...; and


City charters are documents of limitation and a restriction on the City Council's powers imposed by the voters (see, e.g., *City of Glendale v. Trondsen* (1957) 48 C2d 93) and, as a result, the City Council's contracting power is limited by the retention requirement in Article X, Section 67, and the City Council and City Council and City staff lack the power to provide for public works contract retention other than as specified in the City Charter.

19. GOVERNMENT CODE SECTION 1090: The successful Bidder may be precluded from competing for, or participating in, subsequent contracts that result

from or relate to the WORK performed pursuant to this Bid. The ethics laws that apply to the City and all its consultants, contractors, and vendors include California Government Code Section 1090 and following, which prohibits government officials, employees, and contractors from participating in making government contracts in which the official, employee or contractor has a financial interest. Because City contractors always have a financial interest in their City contracts, the Section 1090 prohibition regarding City contractors focuses on whether a contractor is or would be “making a government contract” in a quasi-governmental capacity for purposes of Section 1090. Section 1090 prohibits City contractors from using their role as a contractor to influence how the City spends the public’s funds in a way that benefits the contractor. Penalties for violating Section 1090 are severe, and may include felony criminal penalties, permanent disqualification from holding public office in California, disgorgement of any benefit received by the financially interested contractor, civil and administrative penalties, and voiding of the prohibited contract.

NAME: Dan Herrera, PE
ADDRESS: Department of Public Works and Utilities
202 North McDowell Boulevard
Petaluma, CA 94954
PHONE: (707) 778-4589

20. CITY’S RIGHTS RESERVED: The CITY reserves the right to reject any or all bids, to waive any minor irregularity in a bid, and to make awards to the lowest responsive, responsible bidder as it may best serve the interest of the CITY.

CITY: Petaluma
BY: 
DATE: April 18, 2024

END OF INVITING BIDS

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS. Terms used in these Instructions to Bidders and the Notice Inviting Bids which are defined in the General Conditions have the meanings assigned to them in the General Conditions. The term “Bidder” means one who submits a Bid directly to CITY, as distinct from a sub-bidder, who submits a price or quote to a Bidder.
2. LOCAL BUSINESS LICENSE. All CONTRACTORS, including subcontractors, not already having a local business license for the work contemplated, will be required to secure the appropriate license before a Contract can be executed.
3. INTERPRETATIONS AND ADDENDA.
 - 3.1 All questions about the meaning or intent of the Contract Documents are to be directed to the ENGINEER. Additions, deletions, or revisions to the Contract Documents considered necessary by the ENGINEER in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by the ENGINEER as having received the Contract Documents. Questions **are due May 17, 2024**. Only answers to such questions issued by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
 - 3.2 Addenda may also be issued to make other additions, deletions, or revisions to the Contract Documents.
 - 3.3 Bidders shall make no special interpretation or inference of intent from differing formats in the Technical Specifications.
4. BIDDER’S EXAMINATION OF CONTRACT DOCUMENTS AND SITE.
 - 4.1 It is the responsibility of each Bidder before submitting a Bid:
 - A. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents (including “technical” data referred to below);
 - B. To visit the site to become familiar with local conditions that may affect cost, progress, or performance of the WORK;
 - C. To consider federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the WORK;
 - D. To study and carefully correlate the Bidder’s observations with the Contract Documents; and
 - E. To notify the ENGINEER of all conflicts, errors, ambiguities, or discrepancies in or between the Contract Documents and such other related data.

- 4.2 Reference is made to the Supplementary General Conditions for identification of:
- A. Those reports of explorations and tests of subsurface conditions at the site which have been utilized by the ENGINEER in the preparation of the Contract Documents.
 - B. Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Utilities) which are at or contiguous to the site which have been utilized by the ENGINEER in the preparation of the Contract Documents.
 - C. Those environmental reports or drawings relating to Asbestos, Hazardous Waste, PCBs, Petroleum, and/or Radioactive Materials identified at the site which have been utilized by the ENGINEER in the preparation of the Contract Documents.
 - D. The ENGINEER makes no representation as to the completeness of the reports or drawings referred to in Paragraphs 4.2A, 4.2B, and 4.2C. above or the accuracy of any data or information contained therein. The Bidder may rely upon the accuracy of the technical data contained in such reports and drawings. However, the Bidder may not rely upon any interpretation of such technical data, including any interpretation or extrapolation thereof, or any non-technical data, interpretations, and opinions contained therein.
- 4.3 Copies of reports and drawings referred to in Paragraph 4.2 will be made available by the CITY to any Bidder on request, if said reports and drawings are not bound herein. Those reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which the Bidder is entitled to rely, are incorporated herein by reference.
- 4.4 Information and data reflected in the Contract Documents with respect to Underground Utilities at or contiguous to the site are based upon information and data furnished to the ENGINEER by the owners of such Underground Utilities or others, and the CITY does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary General Conditions.
- 4.5 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Utilities, and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2, 4.3, and 4.4 of the General Conditions.
- 4.6 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and Underground Utilities) at or contiguous to the site or otherwise which may affect cost, progress, or performance of the WORK and which the Bidder deems necessary

to determine its Bid for performing the WORK in accordance with the time, price, and other terms and conditions of the Contract Documents.

- 4.7 On request a minimum of 2 working days in advance, the ENGINEER will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests, and studies as each Bidder deems necessary for submission of a Bid. Location of any excavation or boring shall be subject to prior approval of ENGINEER and applicable agencies. Bidder shall fill all holes, restore all pavement to match existing structural section, and shall clean up and restore the site to its former condition upon completion of such explorations. ENGINEER reserves the right to require Bidder to execute an Access Agreement with the CITY prior to accessing the site.
- 4.8 The lands upon which the WORK is to be performed, rights-of-way, and easements for access thereto and other lands designated for use by the CONTRACTOR in performing the WORK are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the CONTRACTOR. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by the CITY unless otherwise provided in the Contract Documents.
- 4.9 The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of this Paragraph 4 and the following:
 - A. That the Bid is premised upon performing the WORK required by the Contract Documents without exception and such means, methods, techniques, sequences, or procedures of construction (if any) as may be required by the Contract Documents;
 - B. That Bidder has given the ENGINEER written notice of all conflicts, errors, ambiguities, and discrepancies in the Contract Documents and the written resolution thereof by the ENGINEER is acceptable to the Bidder; and
 - C. That the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the WORK.
5. BID FORMS. The Bid shall be submitted on the Bid Forms provided by the City. All blanks on the Bid Forms shall be completed in ink. All names must be printed below the signatures. The Bid shall be submitted in a sealed envelope which shall be plainly marked in the upper left hand corner with the name and address of the Bidder and shall bear the words "BID FOR" followed by the title of the Contract Documents for the WORK, the name of the CITY, the address where Bids are to be delivered or mailed to, and the date and hour of opening of Bids.
- 5.2 The Bid must set forth the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the WORK, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the

WORK according to detailed Drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid or, in the case of bids or offers for the construction of streets and highways, including bridges, in excess of one-half of 1 percent of the prime contractor's total bid or ten thousand dollars (\$10,000), whichever is greater.

6. CERTIFICATES.

6.1 Bids by corporations must be executed in the corporate name by the president, a vice-president, or other corporate officer. Such Bid shall be accompanied by the enclosed Certificate of Authority to sign, attested by the secretary or assistant secretary, and with the corporate seal affixed. The corporate address and state of incorporation must appear below the signature.

6.2 Bids by partnerships must be executed in the partnership name and be signed by a managing partner, accompanied by the enclosed Certificate of Authority to sign, and his/her title must appear under the signature and the official address of the partnership must appear below the signature.

6.3 Bids by joint venture must be executed in the joint venture name and be signed by a joint venture managing partner, accompanied by the enclosed Certificate of Authority to sign, and his/her title must appear under the signature and the official address of the joint venture must appear below the signature.

7. DISQUALIFICATION OF BIDDERS. More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the CITY believes that any Bidder is interested in more than one Bid for the WORK contemplated, all Bids in which such Bidder is interested will be rejected. If the CITY believes that collusion exists among the Bidders, all Bids will be rejected. A party who has quoted prices to a bidder is not hereby disqualified from quoting prices to other Bidders, or from submitting a Bid directly for the WORK. If a Bidder is not registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5 and Section 1771.1, then the Bid may be rejected as non-responsive.

8. QUANTITIES OF WORK. The quantities of work or material stated in unit price items of the Bid are supplied only to give an indication of the general scope of the WORK; the OWNER does not expressly or by implication agree that the actual amount of work or material will correspond therewith, and reserves the right after award to increase or decrease the quantity of any unit price item of the WORK by an amount up to and including 25 percent of any Bid item in its entirety, or to add additional Bid items up to and including an aggregate total amount not to exceed 25 percent of the Bid price.

9. SUBSTITUTE OR "OR EQUAL" ITEMS. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a particular manufacturer and the name is followed by the words "or equal", the Bidder may write the name of a substitute manufacturer (which the Bidder considers as an "or equal") in the List

of Proposed Substitutions in the Bid Forms. The ENGINEER will make a determination of approval or rejection of the proposed substitution prior to award of the Contract. No request for substitution of an “or equal” item will be considered by the ENGINEER after award of the Contract. The procedure for the submittal of substitute or “or equal” products is contained in the Bid Forms. The Bidder shall not be relieved of any obligations of the Contract Documents or be entitled to an adjustment in the Contract Price in the event any proposed substitution is not approved.

10. **COMPETENCY OF BIDDERS.** In selecting the lowest responsive, responsible Bidder, consideration will be given not only to the financial standing but also to the general competency of the Bidder for the performance of the WORK covered by the Bid. To this end, each Bid shall be supported by a statement of the Bidder’s experience as of recent date including: (a) all projects worked on by the Bidder over the past three (3) years including the contract amount for each project; (b) all complaints made against the Contractor’s license in the past ten (10) years; and (c) all claims and lawsuits presented or filed in the last five (5) years, regardless of the form, regarding any public works project.
11. **SUBMISSION OF BIDS.** The Bid shall be delivered by the time and to the place stipulated in the Notice Inviting Bids. It is the Bidder’s sole responsibility to see that its Bid is received in proper time and at the proper place.
12. **BID SECURITY, BONDS, AND INSURANCE.** Each Bid shall be accompanied by a certified or cashier’s check or approved Bid Bond in the amount stated in the Notice Inviting Bids. Said check or bond shall be made payable to the CITY and shall be given as a guarantee that the Bidder, if awarded the WORK, will enter into an Agreement with the CITY and will furnish the necessary insurance certificates, Payment Bond, and Performance Bond. In case of refusal or failure to enter into said Agreement, the check or Bid Bond, as the case may be, shall be forfeited to the CITY. If the Bidder elects to furnish a Bid Bond as its Bid security, the Bidder shall use the Bid Bond form bound herein. Bid Bonds shall comply with the requirements applicable to payment and performance bonds in the General Conditions.
- 12.1 **BIDDING CAPACITY.** Each Bid shall be accompanied by a list of the projects currently being worked on by Bidder, their size, contract price, scheduled completion date, location, and owner. Additionally, Bidder shall provide certified evidence of its current bonding capacity.
13. **DISCREPANCIES IN BIDS.** In the event there is more than one Bid item in a Bid Schedule, the Bidder shall furnish a price for all Bid Items in the Schedule, and failure to do so will render the Bid non-responsive and shall cause its rejection. In the event there are unit price Bid items in a Bidding schedule and the amount indicated for a unit price Bid item does not equal the product of the unit price and quantity, the unit price shall govern and the amount will be corrected accordingly, and the BIDDER shall be bound by said correction. In the event there is more than one Bid item in a Bid Schedule and the total indicated for the Schedule does not agree with the sum of the prices Bid on the individual

items, the prices Bid on the individual items shall govern and the total for the Schedule will be corrected accordingly, and the BIDDER shall be bound by said correction.

14. **MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS.** Unauthorized conditions, limitations, or provisos attached to the Bid shall render it informal and may cause its rejection as being non-responsive. The Bid forms shall be completed without interlineations, alterations, or erasures in the printed text. Alternative Bids will not be considered unless called for. Oral, telegraphic, or telephonic Bids or modifications will not be considered.
15. **WITHDRAWAL OF BID.** The Bid may be withdrawn by the Bidder by means of a written request, signed by the Bidder or its properly authorized representative. Such written request must be delivered to the place stipulated in the Notice Inviting Bids for receipt of Bids prior to the scheduled closing time for receipt of Bids.
16. **BID PROTEST.** Any Bid protest must be submitted in writing to the City Manager before 5:00 p.m. on the fifth (5th) working day following Bid opening.
 - A. The initial protest document must contain a complete statement of the basis for the protest, and all supporting documentation.
 - B. The party filing the protest must have actually submitted a Bid for the WORK. A subcontractor of a party submitting a Bid for the WORK may not submit a Bid protest. A party may not rely on the Bid protest submitted by another Bidder, but must timely pursue its own protest.
 - C. The protest must refer to the specific portion of the bid document which forms the basis for the protest.
 - D. The protest must include the name, address and telephone number of the person representing the protesting party.
 - E. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
 - F. The CITY will give the protested Bidder five (5) working days after the receipt of the protest to submit a written response. The responding Bidder shall transmit the response to the protesting Bidder concurrent with delivery to the CITY.
 - G. The procedure and time limits set forth in this paragraph are mandatory and are the Bidder's sole and exclusive remedy in the event of Bid protest. The Bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal

proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest.

- H. If the CITY determines that a protest is frivolous, the protesting bidder may be determined to be non-responsible and that bidder may be determined to be ineligible for future contract awards.
17. **AWARD OF CONTRACT.** Award of the contract, if awarded, will be made to the lowest responsive, responsible Bidder whose Bid complies with the requirements of the Contract Documents. Unless otherwise specified, any such award will be made within the period stated in the Notice Inviting Bids that the bids are to remain open. Unless otherwise indicated, a single award will be made for all the Bid items in an individual Bid Schedule. In the event the WORK is contained in more than one Bid Schedule, the CITY may award Schedules individually or in combination. In the case of two Bid Schedules which are alternative to each other, only one of such alternative schedules will be awarded. The CITY may condition the award upon the Bidder's timely submission of all items required by the Contract Documents, including, but not limited to the executed Agreement, performance, labor and materials, and maintenance bonds, and required certificates of insurance and endorsements.
18. **RETURN OF BID SECURITY.** Within 14 days after award of the contract, the CITY will, if requested, return the Bid securities accompanying such Bids that are not being considered in making the award. All other Bid securities will be held until the Agreement has been finally executed. They will then be returned, if requested, to the respective Bidders whose Bids they accompany.
19. **EXECUTION OF AGREEMENT.** The Bidder to whom award is made shall execute a written Agreement with the CITY on the form of agreement provided, shall secure all insurance, and shall furnish all certificates and bonds required by the Contract Documents within five (5) working days after receipt of Notice of Award from the CITY. Failure or refusal to enter into an Agreement as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the CITY may award the Contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the OWNER may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, each such Bidder's Bid securities shall be likewise forfeited to the CITY.
20. **LIQUIDATED DAMAGES.** Provisions for liquidated damages, if any, are set forth in the Agreement.
21. **WORKERS' COMPENSATION REQUIREMENT.** The Bidder should be aware that in accordance with Section 3700 of the California Labor Code it will, if awarded the Contract,

be required to secure the payment of compensation to its employees and execute the Workers' Compensation Certification in the form contained in these Contract Documents.

22. NON-COLLUSION AFFIDAVIT. Bidders must execute the following affidavit and submit the same with his/her bid:
23. MATERIALS SUPPLIERS LIST. Bidders and their subcontractors must complete the List of Materials Suppliers and Material Guarantee form provided with the Bid Forms and must submit the completed form with the Bid.

END OF INSTRUCTIONS TO BIDDERS

BID PROPOSAL CERTIFICATE
(if Corporation)

STATE OF CALIFORNIA)
) ss:
COUNTY OF _____)

I HEREBY CERTIFY that a meeting of the Board of Directors of the _____, a corporation existing under the laws of the State of _____, held on _____, 20_____, the following resolution was duly passed and adopted:

“RESOLVED, that _____, as _____ President of the Corporation, be and is hereby authorized to execute the Bid Proposal dated _____, 20_____, for the _____ project, in the City of Petaluma, and that his/her execution thereof, attested by the Secretary of the Corporation, and with the Corporate Seal affixed, shall be the official act and deed of this Corporation.”

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the corporation this _____, day of _____, 20_____.

Secretary

(SEAL)

SECTION I

BID FORMS

(TO BE SUBMITTED WITH BIDS)

BIDDER'S AFFIDAVIT OF NON-COLLUSION SUBMITTED WITH BID

_____, [Contractor] hereby declares that:

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated: _____

Signature

Public Contract Code section 7106
Code of Civil Procedure section 2015.5

END OF BIDDER'S AFFIDAVIT OF NON-COLLUSION SUBMITTED WITH BID

PROPOSAL

To the City Council of the City of Petaluma:

The undersigned declares that he/she has carefully examined the location of the proposed work, that he/she has examined the plans and specifications, and read the accompanying instructions to bidders, and hereby proposes to furnish all materials and do all the work required to complete the said work in accordance with said plans, specifications, and special provisions for the unit or lump sum prices set forth in the attached Bid Schedule.

It is understood and agreed that the undersigned shall complete the work of the contract within the time provided for in the Contract Documents and Specifications governing said work.

If awarded the contract, the undersigned hereby agrees to sign said contract and to furnish the necessary bonds, insurance certificates and agreements within five (5) working days after receipt of Notice of Award of said contract from the City.

The undersigned has examined the location of the proposed work and is familiar with the plans, specifications and other contract documents and the local conditions at the place where the work is to be done.

The undersigned has checked carefully all the figures on the attached Bid Schedule and understands that the City will not be responsible for any errors or omissions on the part of the undersigned in making up the bid.

Enclosed find bidder's bond, certified check, or cashier's check no. _____ of the _____ (Company) (Bank) for _____ Dollars (\$_____).

This project requires a Class A or C-33 California State Contractor's License.

Contractor's License No. _____ License Class _____

Expiration Date of Contractor's License _____

This project requires registration with the California State Department of Industrial Relations.

Public Works Contractor Registration No. _____

Registration Date _____ Expiration Date _____

A bid submitted to a public agency by a contractor who is not licensed and not registered shall be considered non-responsive and shall be rejected by the public agency. The undersigned contractor declares that the contractor's license number, public work contractor registration number, and expiration dates stated herein are made under penalty of perjury under the laws of the State of California.

Contractor: _____

Signed by: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

Email: _____

Dated this _____ day of _____, 20____.

END OF PROPOSAL

BID SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Price
1	Mobilization/Demobilization	1	LS		
2	Interior Tank Coatings	1	LS		
3	Exterior Tank Coatings	1	LS		
4	Valve Vault Improvements	1	LS		
5	Tank Appurtenances Improvements	1	LS		
6	Replace Rafter Ties	40	EA		
7	Door Sheet	1	LS		
8	Electrical Work	1	LS		

Total Base Bid \$ _____

*Note: In case of error in extension of price into the total price column, the unit price will govern.

Total Amount of Bid (written in words) is: _____ _____ Dollars and _____ Cents. In the event of discrepancy between words and figures, the words shall prevail. \$ _____ _____ Figures

ALTERNATE BID SCHEDULES

BID ALTERNATE A

<u>Seal Welding Roof Plates</u>					
Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Price
1	Seal Welding Roof Plates	1	LS		

Total Bid Alternate A \$ _____

*Note: In case of error in extension of price into the total price column, the unit price will govern.

Total Amount of Alternate Bid (written in words) is: _____
 _____ Dollars and
 _____ Cents.
 In the event of discrepancy between words and figures, the words shall prevail.
 \$ _____
 Figures

BID ALTERNATE B

<u>Seal Welding Rafters</u>					
Item No.	Description	Estimated Quantity	Unit	Unit Price	Total Price
1	Seal Welding Rafters	1	LS		

Total Bid Alternate B \$ _____

*Note: In case of error in extension of price into the total price column, the unit price will govern.

Total Amount of Alternate Bid (written in words) is: _____
 _____ Dollars and
 _____ Cents.
 In the event of discrepancy between words and figures, the words shall prevail.
 \$ _____
 Figures

Note: The award of contract shall be based on the lowest responsive and responsible bidder of the Total Base Bid

The City reserves the right to choose any bid alternates to be awarded.

Address of Bidder

Signature of Bidder

City

Name of Bidder (Print)

Telephone Number of Bidder

Fax Number of Bidder

Contractor's License Number

License's Expiration Date

Addendum Acknowledgement

Addendum No. 1 Signature Acknowledging Receipt: _____ Date: _____

Addendum No. 2 Signature Acknowledging Receipt: _____ Date: _____

Addendum No. 3 Signature Acknowledging Receipt: _____ Date: _____

Addendum No. 3 Signature Acknowledging Receipt: _____ Date: _____

LIST OF SUBCONTRACTORS

In accordance with Section 4104 of the Public Contracting Code of the State of California, each bidder shall list below the name and location of place of business of each subcontractor who will perform a portion of the contract work in an amount in excess of one-half of one percent of the total contract price or, in the cases of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor's total bid or ten thousand dollars (\$10,000), whichever is greater. In each such instance, the nature and extent of the work to be performed shall be described.

If a prime contractor fails to specify a subcontractor or if a prime contractor specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half of one percent of the prime contractor's total bid, the prime contractor agrees that he or she is fully qualified to perform that portion himself or herself, and that the prime contractor shall perform that portion himself or herself. The subcontracting of work for which no subcontractor was designated in the original bid and which is in excess of one-half of one percent of the total contract price, will be allowed only with the written consent of the City.

Name of Subcontractor	Address of Office, Mill, or Shop	Description of Work to be Performed (also show Bid Schedule Item Number)	Public Works Contractor Registration Number
--------------------------------------	---	---	--

LIST OF MATERIAL SUPPLIERS AND MATERIAL GUARANTEE

The bidder is required to name the make and supplier of the material items listed below to be furnished under these specifications. The bidder shall name a manufacturer for each item and the supplier of the item if the supplier is not the manufacturer. The naming of more than one supplier for a single item or naming a supplier followed by the words "or equal" will not be acceptable. Substitution of any listed supplier following submission of this form with the Bid shall only be permitted as authorized by the Engineer pursuant to Section 6.3 of the General Conditions.

Failure to complete this form and submit it with the bid proposal may cause the proposal to be rejected as being incomplete and not responsive to the solicitation.

Item	Supplier & Manufacturer	Address

MATERIAL GUARANTEE

In addition to completion of the list of material suppliers on the Material Suppliers form, the bidder may be required to furnish prior to award of contract, a complete statement of the origin, composition and manufacturer of any or all materials to be used in the construction of the work, together with samples, which samples may be subjected to test, provided for in these specifications or in the Special Provisions to determine their quality and fitness for the work.

END OF
LIST OF MATERIAL SUPPLIERS AND MATERIAL GUARANTEE

QUESTIONNAIRE AND FINANCIAL ASSURANCE STATEMENT

The following statements as to experience and financial qualifications of the Proposer are submitted in conjunction with the proposal as a part thereof, and the truthfulness and accuracy of the information is guaranteed by the Proposer.

The Proposer has been engaged in the contracting business under the present business for _____ years. Experience in work of a nature similar to that covered in the proposal extends over a period of _____ years.

The Proposer, as a contractor, has never failed to satisfactorily complete a contract awarded to contractor, except as follows:

List all claims and lawsuits presented or filed in the last five (5) years, regardless of the form, regarding any public works project:

The following contracts for work have been completed in the last three (3) years for the persons, firm or authority indicated and to whom reference is made:

<u>Year</u>	<u>Type of Work-Size, Length and Contract Amount</u>	<u>Location and For Whom Performed</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

The following complaints have been made against the Proposer's contractor's license within the past ten (10) years:

Date: _____ Nature of Complaint _____

Reference is hereby made to the following bank or banks as to the financial responsibility of the proposer:

NAME OF BANK	ADDRESS

Reference is hereby made to the following surety companies as to the financial responsibility and general reliability of the proposer:

NAME OF SURETY COMPANY:

I, the undersigned, declare under penalty of perjury under the laws of the State of California, that the foregoing is true and correct.

SIGNATURE OF PROPOSER

DATE

NAME OF PROPOSER

END OF
QUESTIONNAIRE AND FINANCIAL STATEMENT FORM

**SITE VISIT AFFIDAVIT
TO BE EXECUTED
BY BIDDER, NOTARIZED AND SUBMITTED WITH BID**

(To Accompany Bid)

State of California)
) ss.
County of)

_____, **being first duly sworn**, deposes and says that he or
(Contractor's Authorized Representative)

she is

_____ of _____, the party making the foregoing
(Title of Representative) (Contractor's Name)

bid, has visited the Site of the Work as described in the Contract and has examined and familiarized themselves with the existing conditions, as well as all other conditions relating to the construction which will be performed. The submitting of a bid shall be considered an acknowledgement on the part of the Bidder of familiarity with conditions at the site of Work. The Bidder further acknowledges that the site examination has provided adequate and sufficient information related to existing conditions which may affect cost, progress or performance of the Work.

Signature Name of Bidder

STATEMENT OF QUALIFICATIONS

All Bidders shall submit a Statement of Qualifications as specified herein as an attachment to the Bid Documents.

- A. The following are minimum requirements for the Bidder to be found responsible to perform the Work. Bidder's compliance with the minimum qualification requirements will be measured by the experience of the supervisory personnel who will have responsible charge of the various major components of the Work. If Bidder subcontracts portions of the Work, City, in its determination of whether the minimum qualification requirements have been met, will consider the qualifications of the Subcontractor's supervisory personnel.
1. Five years experience as a continuously operating entity engaged in the performance of similar work.
 2. Satisfactory experience on public works projects, with no history of default termination within 5 years.
 3. Within the past five years, completed three potable water tank coating and rehabilitation projects of a similar nature and complexity with a contract dollar amount of at least \$500,000 each.
 4. Sufficient financial strength, stability and resources as measured by Bidder's equity, debt-to-assets ratio, and capability to finance the Work to be performed.
 5. Evidence that Bidder and its team, including without limitation, its Mechanical, Structural, and Painting and Coating Subcontractors, including the Bidder to the extent Bidder performs such Work itself, (hereafter "designated Subcontractors"), have the human and physical resources of sufficient quantity and quality to perform the Work under Contract Documents in a timely and Specification-compliant manner, to include:
 - a. Construction and management organizations with sufficient personnel and requisite disciplines, licenses, skills, experience, and equipment for the Project. Provide names and resumes of Project Manager and Superintendent.
 - b. A field organization with skills, experience, and equipment sufficient to perform all on-Site Work and necessary scheduling.
 - c. Expertise of Key Personnel to accomplish the duties and responsibilities required to perform the Work under Contract Documents. Minimum experience requirements of Key Personnel including the completion of two projects of similar nature and complexity and having five years of experience on projects of similar nature and complexity.
 - d. List of plant and equipment owned by the Bidder, which is definitely available for use on the proposed work as required (not committed to other projects). Information to include Quantity; Name Type and Capacity; Condition; Location.

6. Any history within the past five (5) years that Bidder ever failed to complete a public works construction project in Petaluma within the time allowed by the contract, including written agreed upon contract time extensions or liquidated damages will eliminate bidder. For any other jurisdictions, Bidder shall provide failure to complete history within last five (5) years. Information to include: jurisdiction name, address, telephone number of the owner of such public works construction project including the name of the agencies' contact person, and further, describe in detail the nature of the improvement work.
-
- B. Owner will notify Apparent Low Bidder in writing of any deficiencies found and will provide Bidder the opportunity to respond in writing with reasonable clarifications but will not allow any changes in the nature of Bidder as a business entity.

BID BOND

We, _____ as Principal, and _____ as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the City of Petaluma (herein called "the Owner") for the payment of the penal sum of _____ Dollars (\$_____), lawful money of the United States, which is ten (10) percent of the total amount bid by bidder to the Owner. Principal has submitted the accompanying bid for the construction of the _____ project.

If the Principal is awarded the contract and enters into a written contract, in the form prescribed by the Owner, at the price designated by his bid, and files the bonds required by the Agreement with the Owner, and carries all insurance in type and amount which conforms to the contract documents and furnishes required certificates and endorsements thereof, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

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

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

Executed on _____, _____.

PRINCIPAL

By _____
Signature

Title

Any claims under this bond may be addressed to:

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

(Telephone number of Surety's agent in California)

(Attach Acknowledgment)

SURETY

By _____
(Attorney-in-Fact)

NOTICE:

No substitution or revision to this bond form will be accepted. Be sure that all bonds submitted have a certified copy of the bonding agent's power of attorney attached. Also verify that Surety is an "Admitted Surety" (i.e., qualified to do business in California), and attach proof of verification (website printout from the California Department of Insurance website (<http://www.insurance.ca.gov/docs/index.html>) or certificate from County Clerk).

END OF BID BOND

SECTION II
GENERAL CONDITIONS

CITY OF PETALUMA - GENERAL CONDITIONS

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ARTICLE 1 - DEFINITIONS

Whenever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated in this Article 1 which meanings are applicable to both the singular and plural thereof. If a word which is entirely in upper case in these definitions is found in lower case in the Contract Documents, then the lower case word will have its ordinary meaning.

Addenda - Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the Contract Documents.

Agreement - The written contract between the CITY and the CONTRACTOR covering the WORK to be performed; other documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment - The form accepted by the ENGINEER which is to be used by the CONTRACTOR to request progress payments or final payment and which is to be accompanied by such supporting documentations as is required by the Contract Documents.

Asbestos - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Bid - The offer or proposal of the bidder submitted on the prescribed form setting forth the price or prices for the WORK.

Bonds - Bid, Performance, and Labor and Materials, and Maintenance Bonds and other instruments of security.

Change Order - A document recommended by the ENGINEER, which is signed by the CONTRACTOR and the CITY, and authorizes an addition, deletion, or revision in the WORK, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

CITY - The City of Petaluma.

Clarification - A document issued by the ENGINEER to the CONTRACTOR that clarifies the requirements(s) and/or design intent of the Contract Documents, which may not represent an addition, deletion, or revision in the WORK or an adjustment in the Contract Price or the Contract Times.

Contract Documents - The Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates, affidavits and other documentation), Agreement, Performance Bond, Labor and Materials Bond, Maintenance Bond, General Conditions, any Supplementary General

Conditions, Special Provisions, Specifications, Drawings, all Addenda, and Change Orders executed pursuant to the provisions of the Contract Documents. Shop Drawings are not Contract Documents.

Contract Price - The total monies payable by the CITY to the CONTRACTOR under the terms and conditions of the Contract Documents.

Contract Times - The number or numbers of successive calendar days or dates stated in the Contract Documents for the completion of the WORK.

CONTRACTOR - The individual, partnership, corporation, joint-venture, or other legal entity with whom the CITY has executed the Agreement.

Day - A calendar day of 24 hours measured from midnight to the next midnight.

Defective Work - Work that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or work that has been damaged prior to the ENGINEER's recommendation of final payment.

Drawings - The drawings, plans, maps, profiles, diagrams, and other graphic representations which indicate the character, location, nature, extent, and scope of the WORK and which have been prepared by the ENGINEER and are included and/or referred to in the Contract Documents. Shop Drawings are not Drawings as so defined.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

ENGINEER - The City Manager or his/her designee.

Field Order - A written order issued by the ENGINEER which may or may not involve a change in the WORK.

Hazardous Waste - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 U.S.C. Section 6906) as amended from time to time.

Laws and Regulations; Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

Lien or Mechanic's Lien - A form of security, an interest in real property, which is held to secure the payment of an obligation. When related to public works construction, Lien or Mechanic's Lien may be called Stop Notice.

Milestone - A principal event specified in the Contract Documents relating to an intermediate completion date of a separately identifiable part of the WORK or a period of time within which the separately identifiable part of the WORK should be performed prior to completion of all the WORK.

Notice of Award - The written notice by the CITY to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein within the time specified, the CITY will enter into an Agreement.

Notice of Completion - A form signed by the ENGINEER and the CONTRACTOR recommending to the CITY that the WORK is Complete and fixing the date of completion. After acceptance of the WORK by the CITY Council, the form is signed by the CITY and filed with the County Recorder. This filing starts the 30 day lien filing period on the WORK.

Notice to Proceed - The written notice issued by the CITY to the CONTRACTOR authorizing the CONTRACTOR to proceed with the WORK for the purpose for which it is intended prior to completion of all the WORK.

Partial Utilization - Use by the CITY of a completed part of the WORK for the purpose for which it is intended prior to completion of all the WORK.

Petroleum - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

Project - The total construction project of which the WORK to be provided under the Contract Documents may be the whole, or as part as indicated elsewhere in the Contract Documents.

Record Drawings - Drawings generated by marking a set of Drawings to reflect all of the changes that have occurred during construction of the Project.

Resident Project Representative - The authorized representative of the ENGINEER who is assigned to the Site or any part thereof.

Samples - Physical examples of materials, equipment, or workmanship that are representative of some portion of the WORK and which establish the standards by which such portion of the WORK will be judged.

Shop Drawings - All drawings, diagrams, illustrations, schedules, and other data which are specifically prepared by or for the CONTRACTOR and submitted by the CONTRACTOR to illustrate some portion of WORK.

Site - Lands or other areas designated in the Contract Documents as being furnished by the CITY for the performance of the construction, storage, or access.

Special Provisions - Specific clauses setting forth conditions or requirements peculiar to the work and supplementary to the Standard Specifications.

Specifications - The directions, provisions and requirements set forth in the Standard Specifications as supplemental and modified by the special provisions.

Stop Notice - A legal remedy for subcontractors and suppliers who contribute to public works, but who are not paid for their work, which secures payment from construction funds possessed by the CITY. In some states, for public property, the Stop Notice remedy is designed to substitute for a mechanic's lien.

Subcontractor - An individual, partnership, corporation, joint-venture, or other legal entity having a direct contract with the CONTRACTOR or with any other subcontractor for the performance of a part of the WORK at the Site.

Supplementary General Conditions - The part of the Contract Documents which make additions, deletions, or revisions to these General Conditions.

Supplier - A manufacturer, fabricator, distributor, materialman, or vendor having a direct contract with the CONTRACTOR or with any Subcontractor to furnish materials, equipment, or product to be incorporated in the WORK by the CONTRACTOR or any Subcontractor.

Utilities - All pipelines, conduits, ducts, cables, wires, tracks, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground or above the ground to furnish any of the following services or materials; water, sewage, sludge, drainage, fluids, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic control, or other control systems.

WORK - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. WORK is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

Working day - Any day except Saturdays, Sundays and CITY holidays.

ARTICLE 2 – PRELIMINARY MATTERS

2.1 DELIVERY OF BONDS AND INSURANCE CERTIFICATES

- A. When the CONTRACTOR delivers the signed Agreement to the CITY, the CONTRACTOR shall also deliver to the CITY such Bonds and insurance policies and certificates as the CONTRACTOR may be required to furnish in accordance with the Contract Documents.

2.2 COPIES OF DOCUMENTS

- A. The CITY will furnish to the CONTRACTOR the required number of copies of the Contract Documents specified in the Supplementary General Conditions.

2.3 COMMENCEMENT OF CONTRACT TIMES; NOTICE TO PROCEED

- A. The Contract Times will start to run on the commencement date stated in the Notice to Proceed.

2.4 STARTING THE WORK

- A. The CONTRACTOR shall begin to perform the WORK on the commencement date stated in the Notice to Proceed, but no work shall be done at the Site prior to said commencement date.
- B. Before undertaking each part of the WORK, the CONTRACTOR shall review the Contract Documents in accordance with Paragraph 3.3.

2.5 PRECONSTRUCTION CONFERENCE

- A. The CONTRACTOR is required to attend a preconstruction conference. This conference will be attended by the CITY, ENGINEER, and others as appropriate in order to discuss the WORK.
- B. The CONTRACTOR's initial schedule submittals for shop drawings, obtaining permits, and Plan of Operation and CPM Schedule will be reviewed and finalized. At a minimum, the CONTRACTOR's representatives shall include its project manager, project superintendent and schedule expert. If the submittals are not finalized at the end of the meeting, additional meetings will be held so that the submittals can be finalized prior to the submittal of the first Application for Payment. No Application for Payment will be processed prior to receiving acceptable initial submittals from the CONTRACTOR.

ARTICLE 3 – INTENT AND USE OF CONTRACT DOCUMENTS

3.1 INTENT

- A. The Contract Documents comprise the entire agreement between the CITY and the CONTRACTOR concerning the WORK. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the State of California .
- B. It is the intent of the Contract Documents to describe the WORK, functionally complete, to be constructed in accordance with the Contract Documents. Any

labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not called for specifically.

- C. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe work, materials, or equipment such words or phrases shall be interpreted in accordance with that meaning unless a definition has been provided in Article 1 of the General Conditions.

3.2 REFERENCE TO STANDARDS

- A. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code shall be effective to change the duties and responsibilities of the CITY or the CONTRACTOR or any of their consultants, agents or employees, from those set forth in the CONTRACT Documents, nor shall it be effective to assign to CITY any duty or authority to direct the performance of the WORK or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.3 REVIEW OF CONTRACT DOCUMENTS

- A. If, during the performance of the WORK, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the WORK or of any such standard, specification, manual, or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once, and CONTRACTOR shall not proceed with the work affected thereby (except in an emergency as authorized by Paragraph 6.13 until a Clarification, Field Order, or Change Order to the Contract Documents has been issued.

3.4 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

A. Unless otherwise noted herein, conflicts or inconsistencies between parts of the Contract will be resolved by the ENGINEER with a Change Order or an Addendum, if required. Addenda and Change Orders bearing the most recent date shall prevail over Addenda or Change Orders bearing earlier dates. Any reference to addenda-changed specifications or drawings shall be considered to have been changed accordingly. In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Change Orders/Addenda (most recent in time take precedence)
2. Agreement and Bond Forms
3. Referenced Standard Specifications
4. Special Provisions
5. Drawings
6. General Conditions
7. Instructions to Bidders
8. Contractor's Bid (Bid Form)
9. Notice Inviting Bids
10. Supplementary General Conditions (if any)
11. Permits from other agencies as may be required by law

B. With reference to the Drawings the order of precedence is as follows:

1. Figures govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda/Change Order drawings govern over any other drawings
4. Drawings govern over standard drawings

3.5 AMENDING CONTRACT DOCUMENTS

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the WORK or to modify the terms and conditions thereof by a Change Order (pursuant to Article 10).

3.6 REUSE OF DOCUMENTS

A. Neither the CONTRACTOR, nor any Subcontractor or Supplier, nor any other person or organization performing any of the WORK under a contract with the CITY shall have or acquire any title to or ownership rights in any of the Drawings, Technical Specifications, or other documents used on the WORK, and they shall no reuse any of them on the extensions of the Project or any other project without written consent of CITY.

ARTICLE 4 – SITE OF THE WORK

4.1 AVAILABILITY OF LANDS

- A. The CITY will furnish, as indicated in the Contract Documents, the lands upon which the WORK is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of the CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the CITY, unless otherwise provided in the Contract Documents. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or rights-of-way provided. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment; provided, that the CONTRACTOR shall not enter upon nor use any property not under the control of the CITY until a written temporary construction easement agreement has been executed by the CONTRACTOR and the property owner, and a copy of said easement furnished to the ENGINEER prior to said use; and the CITY will not be liable for any claims or damages resulting from the CONTRACTOR's trespass on or use of any such properties. The CONTRACTOR shall provide the CITY with a signed release from the property owner confirming that the lands have been satisfactorily restored upon completion of the WORK.

4.2 REPORTS OF PHYSICAL CONDITIONS

- A. **Subsurface Explorations:** Reference is made to any Supplementary General Conditions for identification of those reports of explorations and tests of subsurface conditions at the Site that have been utilized by the ENGINEER in the preparation of the Contract Documents.
- B. **Existing Structures:** Reference is made to any Supplementary General Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except underground Utilities referred to in Paragraph 4.3 herein) which are at or contiguous to the Site that have been utilized in the preparation of the Contract Documents.
- C. The CITY makes no representation as to the completeness of the reports or drawings referred to in Paragraph 4.2 A or B above or the accuracy of any data or information contained therein. The CONTRACTOR may rely upon the accuracy of the technical data contained in such reports and drawings. However, the CONTRACTOR may not rely upon any interpretation of such technical data, including any interpolation or extrapolation thereof, or any non-technical data, interpretations, and opinions contained therein.

4.3 PHYSICAL CONDITIONS - UNDERGROUND UTILITIES

- A. **Indicated:** The information and data indicated in the Contract Documents with respect to existing underground Utilities at or contiguous to the Site are based on information and data furnished to the CITY or the ENGINEER by the owners of such underground Utilities or by others. Unless it is expressly provided in any Supplementary General Conditions the CITY will not be responsible for the accuracy or completeness of any such information or data, and the CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all underground Utilities indicated in the Contract Documents, for coordination of the WORK with the owners of such underground Utilities during construction, for the safety and protection thereof and repairing any damage thereto resulting from the WORK, the cost of all of which are deemed to have been included in the Contract Price.
- B. **Not Indicated:** If an underground Utility is uncovered or revealed at or contiguous to the Site which was not indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall identify the owner of such underground Utility and give written notice thereof to that owner and shall notify the ENGINEER.

4.4 DIFFERING SITE CONDITIONS

- A. The CONTRACTOR shall notify the ENGINEER, in writing, of the following unforeseen conditions, hereinafter called differing Site conditions, promptly upon their discovery (but in no event later than 14 days after their discovery) and before they are disturbed:
 - 1. Subsurface or latent physical conditions at the Site of the WORK differing materially from those indicated, described, or delineated in the Contract Documents, including those reports discussed in Paragraph 4.2, 4.3, and 4.5.
- B. The ENGINEER will review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto.
- C. If the ENGINEER concludes that because of newly discovered conditions a change in the Contract Documents is required, a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the difference.
- D. In each such case, an increase or decrease in the Contract Price or an extension or shortening the Contract Times, or any combination thereof, will be allowable to the extent that they are attributable to any such difference. If the ENGINEER and the CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefor as provided in Articles 11 and 12.

- E. The CONTRACTOR's failure to give notice of differing Site conditions within 14 days of their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith, whether direct or consequential in nature.

4.5 HAZARDOUS MATERIALS

- A. CITY shall be responsible for any Asbestos, Hazardous Waste, Petroleum, or Radioactive Material uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the WORK and which may present a substantial danger to persons or property exposed thereto in connection with the WORK at the Site. CITY will not be responsible for any such material brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.
 - 1. Upon discovery of any Asbestos, Hazardous Waste, Petroleum, or Radioactive Material, the CONTRACTOR shall immediately stop all work in any area affected thereby (except in an emergency as required by Paragraph 6.13) and notify ENGINEER (and therefore confirm such notice in writing). CONTRACTOR shall not be required to resume any work in any such affected area until after CITY has obtained any required permits related thereto and delivered to CONTRACTOR special written notice. Such written notice will specify that such condition and any affected area is or has been rendered safe for the resumption of the work or specify any special conditions under which the work may be resumed safely. If ENGINEER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of adjustment, if any, in Contract Price or Contract Times as a result of such work stoppage or such special conditions under which work is agreed by CONTRACTOR to be resumed, either party may make a claim therefor as provided in Articles 11 and 12.
 - 2. If, after receipt of such special written notice, CONTRACTOR does not agree to resume such WORK based on a reasonable belief it is unsafe, or does not agree to resume such WORK under special conditions, ENGINEER may order such portion of the WORK that is in connection with such hazardous condition or in such affected area to be deleted from the WORK. If ENGINEER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the WORK then either party may make a claim therefor as provided in Articles 11 and 12. CITY may have such deleted portion of the WORK performed by CITY's own forces or others in accordance with Article 7.
- B. The provisions of Paragraphs 4.2, 4.3, and 4.4 are not intended to apply to Asbestos, Petroleum, Hazardous Waste, or Radioactive Material uncovered or revealed at the Site.

4.6 REFERENCE POINTS

- A. The ENGINEER will provide the location and elevation of one bench mark, near or on the Site of the WORK, for use by the CONTRACTOR for alignment and elevation control. Unless otherwise specified in any Supplementary General Conditions, the CONTRACTOR shall furnish all other lines, grades, and bench marks required for proper execution of the WORK.
- B. The CONTRACTOR shall preserve or replace any and all bench marks, section corners, witness corners, stakes, and other survey marks, and in case of their removal or destruction by any party, the CONTRACTOR shall be responsible for the accurate replacement of such reference points by surveyor licensed under the applicable state codes governing land surveyors.

ARTICLE 5 – BONDS AND INSURANCE

5.1 BONDS

- A. The CONTRACTOR shall furnish Performance and Labor and Materials Bonds, each in the amount of one hundred percent (100%) of the contract price, as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date of completion, except as otherwise provided by Law or Regulation or by the Contract Documents. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions.
- B. The CONTRACTOR shall guarantee the WORK to be free of defects in material and workmanship for a period of one (1) year following the CITY's acceptance of the WORK. The CONTRACTOR shall agree to make, at the CONTRACTOR's own expense, any repairs or replacements made necessary by defects in material or workmanship which become evident within the one-year guarantee period. The CONTRACTOR's guarantee against defects required by this provision shall be secured by a Maintenance Bond, in the amount of ten percent (10%) of the contract price, which shall be delivered by the CONTRACTOR to the CITY prior to acceptance of the WORK. The Maintenance Bond shall remain in force for one (1) year from the date of acceptance of the contracted WORK. The CONTRACTOR shall make all repairs and replacements within the time required during the guarantee period upon receipt of written order from the ENGINEER. If the CONTRACTOR fails to make the repairs and replacements within the required time, the CITY may do the work and the CONTRACTOR and the CONTRACTOR's surety for the Maintenance Bond shall be liable to the CITY for the cost. The expiration of the Maintenance Bond during the one-year guarantee period does not operate to waive or void the one-year guarantee, as set forth herein and in paragraph 6.16 of these General Conditions.

- C. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent’s authority to act.
- D. If the surety on any Bond furnished by the CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days thereafter substitute another Bond and surety, which must be acceptable to the CITY.
- E. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the State of California to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

5.2 INSURANCE

Contractor and any subcontractor shall not commence work under this Agreement until Contractor shall have obtained all insurance required under this paragraph and such insurance shall have been approved by the City Attorney as to form and carrier and the City Manager as to sufficiency, nor shall Contractor allow any contractor or subcontractor to commence work on this contract or subcontract until all similar insurance required of the contractor and/or subcontractor shall have been so obtained and approved. All requirements herein provided shall appear either in the body of the insurance policies or as endorsements and shall specifically bind the insurance carrier.

CONTRACTOR shall procure and maintain for the duration of the contract all necessary insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, the Contractor’s agents, representatives, employees or subcontractors.

A. Minimum Scope of Insurance

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage.
2. Insurance Services Office form number CA covering Automobile Liability, code 1 (any auto).
3. Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.
4. [Optional] Such other insurance coverages and limits as may be required by the CITY as follows: _____.

B. Minimum Limits of Insurance

CONTRACTOR shall maintain limits no less than:

1. General Liability: \$2,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate liability is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: \$1,000,000 per accident for bodily injury and property damage.
3. Employer's Liability: Bodily Injury by Accident - \$1,000,000 each accident
Bodily Injury by Disease - \$1,000,000 policy limit
Bodily Injury by Disease - \$1,000,000 each employee

C. Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the CITY. At the option of the CITY, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the CITY, its officers, officials, employees, and volunteers; or the CONTRACTOR shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

D. Other Insurance Provisions

The required general liability and automobile policies are to contain, or be endorsed to contain the following provisions:

1. The CITY, its officers, officials, employees, agents and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the CONTRACTOR; products and completed operations of the CONTRACTOR; premises owned, occupied or used by the CONTRACTOR; or automobiles owned, leased, hired or borrowed by the CONTRACTOR. The coverage shall contain no special limitations on the scope of protection afforded to the CITY, its officers, officials, employees, agents or volunteers.
2. For any claims related to this project, the CONTRACTOR's insurance coverage shall be primary insurance as respects the CITY, its officers, officials, employees, agents and volunteers. Any insurance or self-insurance maintained by the CITY, its officers, officials, employees, agents or volunteers shall be excess of the CONTRACTOR's insurance and shall not contribute with it.
3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the CITY, its officers, officials, employees, agents or volunteers.
4. The CONTRACTOR's insurance shall apply separately to each insured against whom claim is made or suit is brought except, with respect to the limits of the insurer's liability.
5. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the CITY.

E. Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

F. Verification of Coverage

CONTRACTOR shall furnish the CITY with original endorsements effecting coverage required by this clause. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on forms provided by the CITY. All endorsements are to be received and

approved by the CITY before work commences. As an alternative to the CITY's forms, the CONTRACTOR's insurer may provide complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.1 COMMUNICATIONS

- A. Written communications with the CITY shall be only through or as directed by the ENGINEER.

6.2 SUPERVISION AND SUPERINTENDENCE

- A. The CONTRACTOR shall supervise, inspect, and direct the WORK competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the WORK in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction and all safety precautions and programs incidental thereto. The CONTRACTOR shall be responsible to see that the completed WORK complies accurately with the Contract Documents.
- B. The CONTRACTOR shall designate in writing and keep on the Site at all times during the performance of the WORK a technically qualified, English-speaking superintendent, who is an employee of the CONTRACTOR and who shall not be replaced without written notice to the ENGINEER. The superintendent will be the CONTRACTOR's representative at the Site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to the CONTRACTOR.
- C. The CONTRACTOR's superintendent shall be present at the Site at all times while work is in progress and shall be available by phone for emergencies 24 hours per day, 7 days per week. Failure to observe this requirement shall be considered suspension of the WORK by the CONTRACTOR until such time as such superintendent is again present at the Site.

6.3 LABOR, MATERIALS, AND EQUIPMENT

- A. The CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. The CONTRACTOR shall furnish, erect, maintain, and remove the construction plant and any required temporary works. The CONTRACTOR shall at all times maintain good discipline and order at the Site. Except in connection with the safety or protection of persons or the WORK or property at the Site or adjacent thereto, and except as otherwise indicated in the

Contract Documents, all work at the Site shall be performed during regular working hours, and the CONTRACTOR will not permit overtime work or the performance of work on Saturday, Sunday, or any federally observed holiday without the CITY's written consent. The CONTRACTOR shall apply for this consent through the ENGINEER in writing a minimum of 24 hours in advance.

- B. Except as otherwise provided in this Paragraph, the CONTRACTOR shall receive no additional compensation for overtime work, i.e., work in excess of 8 hours in any one calendar day or hours in any one calendar week, even though such overtime work may be required under emergency conditions and may be ordered by the ENGINEER in writing. Additional compensation will be paid to the CONTRACTOR for overtime work only in the event extra work is ordered by the ENGINEER and the Change Order specifically authorizes the use of overtime work and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime work of a similar nature in the same locality.
- C. All increased costs of inspection and testing performed during overtime work by the CONTRACTOR which is allowed solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The CITY has the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due to the CONTRACTOR.
- D. Unless otherwise specified in the Contract Documents, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, lubricants, power, light, heat, telephone, water, sanitary facilities, and all other facilities, consumables, and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the WORK.
- E. All materials and equipment incorporated into the WORK shall be of specified quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of the CITY. If required by the ENGINEER, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provisions of any such instructions will be effective to assign to the CITY or any of its consultants, agents, or employees, any duty or authority to supervise or direct the furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9 C.
- F. The work, unless otherwise permitted or approved by the ENGINEER, shall be completed with the incorporated use of equipment, materials, and/or products where such are specified. Substitutions and equal alternatives will be permitted as

provided in this article; however, neither the request for substitution nor the offer of alternatives shall in any way by their submittal obligate the CITY to assent to any request or offer. Failure of the CONTRACTOR awarded the work to either submit requests for substitutions or to offer alternatives within the required times provided in this General Condition will be considered as evidence that the work shall be accomplished with trade-named equipment, materials, and/or products as identified in the Specifications and/or the Drawings.

- G. Unless otherwise provided elsewhere in the Contract, all equipment, materials, and/or products incorporated into the work shall be new and, where not specified, shall be of the highest quality of the respective kinds for the intended use, and all workmanship shall meet or exceed applicable construction industry standards and practices. If equipment, materials, and/or products are designated by listing named manufacturers of particular equipment, materials, and/or products followed by the words "or equal," then the CONTRACTOR may furnish the named equipment, materials, and/or products or any equal equipment, materials, and/or products. The first-named manufacturer of particular equipment, materials, and/or products is the basis for the design shown on the Project Drawings. A subsequently named manufacturer or particular equipment, materials, and/or products has been determined to be an acceptable substitution but may require modifications in the Project's design and its ultimate construction to accommodate its use. If such subsequently named items are selected by the CONTRACTOR for incorporation into the work, the CONTRACTOR shall assume all costs required for modifications to the equipment, materials, and/or products, and Project design and construction as may be required for said items' use. Substitutions for an unnamed "equal" item of material shall be permitted upon compliance of the procedures set forth in Paragraph I of this article. If a CONTRACTOR makes use of an unnamed "equal" product as a substitute for a specifically named material or product, the CONTRACTOR shall assume all costs required to make the necessary revisions or modifications to accommodate the use of said unnamed product.
- H. Before beginning the work and within thirty-five (35) calendar days after award of the Contract, the CONTRACTOR shall submit a List of Materials to the ENGINEER for review. The List shall include all items of equipment, materials, and/or products to be incorporated into the work and the names of suppliers with whom purchase orders have been placed. The names on the List shall be arranged in the same order as in the specifications, and shall contain sufficient data to identify precisely the items of equipment, materials, and/or products the CONTRACTOR proposes to furnish. The List shall include Specifications or Drawing references. Once the submission is determined to be acceptable to the ENGINEER, it shall be returned to the CONTRACTOR.
- I. Substitution for those equipment, materials, and/or products specified shall only be permitted when the proposed unnamed "equal" product or material to be furnished is both equal in quality and utility and after the CONTRACTOR has

complied with the following provisions: (1) All substitutions shall be reviewed by the ENGINEER. (2) The ENGINEER must approve such substitution in writing prior to its incorporation into the work. (3) Unless otherwise authorized in writing by the CITY, the CONTRACTOR shall, within thirty-five (35) calendar days of award and prior to placing any purchase orders, but at least thirty (30) calendar days before it requires approval of any such alternative item, submit to the CITY sufficient data, drawings, samples, literature, or other detailed information as will demonstrate to the ENGINEER that the proposed substitute is equal in quality and utility to the equipment, materials and/or products specified.

1. Within thirty (30) calendar days following receipt of all requested information from the CONTRACTOR, the ENGINEER will determine whether the proposed alternative is equal in quality and utility and meets the requirements of the Contract and will inform the CONTRACTOR in writing of such determination. The burden of substantiating the quality and utility of alternatives shall be upon the CONTRACTOR, and the CONTRACTOR shall furnish all necessary information requested and required by the ENGINEER. The ENGINEER will be the sole judge as to the quality and utility of alternative equipment, materials, and/or products, and the ENGINEER's decision shall be final. An acceptance by the ENGINEER of a substitution shall not relieve the CONTRACTOR from complying with the requirements of the Drawings and Specifications. Acceptance by the ENGINEER shall not relieve the CONTRACTOR from full responsibility for the efficiency, sufficiency, and quality and performance of the substitute equipment, materials, and/or products, in the same manner and degree as the equipment, materials, and/or products specified by name.
2. Failure of the CONTRACTOR to submit proposed substitutions for review in the manner described above and within the time prescribed shall be sufficient cause for rejection by the CITY of any other proposed substitutions.
3. In determining whether a proposed product is equal in quality and utility, the ENGINEER is not restricted to such basic issues as performance and durability, but may consider any other issues that the ENGINEER, in the discretion of the ENGINEER, deems appropriate. Said issues may, but are not required to include, nor are they limited to, such additional factors as comparable performance, reliability, efficiency of operation, ease of operation, adaptability, ease of maintenance, capital costs, life-cycle costs, operational characteristics, costs of training personnel, maintenance history, warranties, problems created by the resulting overall warranty system, availability of qualified service, availability of parts, the history of any supplier and compatibility with existing facilities.

4. No one factor or group of factors, including such issues as savings on capital costs, shall be determinative of whether the proposed product or material is equal in quality and utility. The decision of the ENGINEER shall be based on those factors deemed by the ENGINEER to be relevant and any data, drawings, samples, literature, or other detailed information furnished by the CONTRACTOR with respect to the proposed substitution. Each decision as to whether a product or material is equal in quality and utility shall be made by the ENGINEER on a case-by-case basis.
5. The CONTRACTOR shall be responsible for any and all costs, including consultant costs, incurred by the CITY with respect to the proposed substitution that exceed the costs inherent in the normal and reasonable review of drawings and other standard data, information, and documents concerning any proposed substitution. The CONTRACTOR shall be responsible for this cost, regardless of whether or not the substitution is approved by the ENGINEER.
- J. Unless otherwise provided in the Contract, the title and interest in the right to the use of all water, and the title to all soil, stone, gravel, sand, minerals, timber, and all other materials developed or obtained within the Project limits from operations by the CONTRACTOR or any of its subcontractors, of any of their representatives or employees, and the right to use or dispose of the same are hereby expressly reserved in the CITY; and neither the CONTRACTOR nor any of its subcontractors, nor any of their representatives or employees, shall have any right, title, or interest in or to any part thereof.
- K. All material used under the Contract after it has been attached or affixed to the work or soil and after partial payment has been made therefore shall become the property of the CITY.
- L. In the event that any Indian relics or items possessing archaeological or historical value are discovered by the CONTRACTOR or any of its subcontractors or any of their representatives or employees, the CONTRACTOR shall immediately notify the ENGINEER and await the ENGINEER's decision before proceeding with any work. The CONTRACTOR shall have no property right in such relics and items.
- M. The CONTRACTOR shall be satisfied as to the quantity of acceptable materials or products which may be produced or obtained at local sources, and the CITY will not assume any responsibility as to the quantities or quality of acceptable materials or products available.
- N. The CONTRACTOR, with the permission of the ENGINEER, may use in the proposed construction such stone, gravel, sand, or other material suitable in the opinion of the ENGINEER as may be found in excavation.

- O. Existing equipment, materials, and/or products to be salvaged shall remain the property of the CITY. Salvage to be reinstalled in the work shall be refurbished as required before reinstallation. Other work to be salvaged shall be carefully removed and handled in such a manner as to avoid damage and shall be delivered to storage at a location designated by the ENGINEER.

6.4 SCHEDULE

- A. The CONTRACTOR shall comply with the schedule requirements in the Special Provisions or as otherwise provided in the Contract Documents.

6.5 SUBSTITUTES OR “OR EQUAL” ITEMS

- A. The CONTRACTOR shall submit proposed substitutes or “or equal” items in accordance with the Bidding Requirements. No request for substitution of an “or equal” item will be considered by the ENGINEER after award of the Contract, except as provided in Paragraph 6.3I herein.

6.6 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- A. The CONTRACTOR shall be responsible to the CITY for the acts and omissions of its Subcontractors, Suppliers, and their employees to the same extent as CONTRACTOR is responsible for the acts and omissions of its own employees. Nothing contained in this Paragraph shall create any contractual relationship between any Subcontractor and the CITY nor relieve the CONTRACTOR of any liability or obligation under the Contract Documents. The CONTRACTOR shall include these General Conditions and the Supplementary General Conditions as part of all its subcontract and supply agreements.

6.7 PERMITS

- A. Unless otherwise provided in any Supplementary General Conditions, the CONTRACTOR shall obtain and pay for all construction permits and licenses from the agencies having jurisdiction, including the furnishing of insurance and bonds if required by such agencies. The enforcement of such requirements shall not be made the basis for claims for additional compensation by CONTRACTOR. When necessary, the CITY will assist the CONTRACTOR, in obtaining such permits and licenses. The CONTRACTOR shall pay all charges of utility owners for inspection or connections to the WORK.

6.8 PATENT FEES AND ROYALTIES

- A. The CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the WORK or the incorporation in the WORK of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design,

process, product, or device is specified in the Contract Documents for use in the performance of the WORK and if to the actual knowledge of the ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed by the ENGINEER in the Contract Documents. The CONTRACTOR's indemnification obligation under this Paragraph 6.8 A. for all claims and liabilities arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product or device not specified in the Contract Documents shall be in accordance with Paragraph 6.16 of these General Conditions.

6.9 LAWS AND REGULATIONS

- A. The CONTRACTOR shall observe and comply with all Laws and Regulations which in any manner affect those engaged or employed on the WORK, the materials used in the WORK, or the conduct of the WORK including, but not limited to, all applicable safety Laws and Regulations. If any discrepancy or inconsistency should be discovered between the Contract Documents and any such Laws or Regulations, the CONTRACTOR shall report the same in writing to the ENGINEER. Any particular Law or Regulation specified or referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of federal, state, and local laws and regulations. The CONTRACTOR's indemnification obligations for all claims or liability arising from violation of any such law, ordinance, code, order, or regulation, whether by CONTRACTOR or by its employees, Subcontractors or Suppliers shall be in accordance with Paragraph 6.16 of these General Conditions.

6.10 TAXES

- A. The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by the CONTRACTOR in accordance with the laws and regulations of the place of the Project which are applicable during the performance of the WORK.

6.11 USE OF PREMISES

- A. The CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site, the land and areas identified in and permitted by the Contract Documents, and the other land and areas permitted by Laws and Regulations, rights-of-way, permits, and easements. The CONTRACTOR shall assume full liability and responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the WORK. Should any claim be made against the CITY by any such owner or occupant because of the performance of the WORK, the CONTRACTOR shall

promptly attempt to settle with such other party by agreement or otherwise resolve the claim through litigation at the CONTRACTOR's sole liability expense. The CONTRACTOR's indemnification obligations for all claims and liability, arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any such owner or occupant against the CITY, its consultants, subconsultants, and the officers, directors, employees and agents of each and any of them to the extent caused by or based upon the CONTRACTOR's performance of the WORK shall be in accordance with Paragraph 6.16 of these General Conditions.

6.12 SAFETY AND PROTECTION

- A. The CONTRACTOR shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall be responsible for the direction and control of the work assigned and for assuring that all workers on the project understand the hazards of the work involved and the safe work procedures required for each job. The CONTRACTOR shall assure that its subcontractors of all tiers shall, without expense to the CITY, comply with this safety responsibility. No work shall proceed until each worker and subcontractor understands the scope of the work and all safety rules and work procedures to be followed. The CONTRACTOR shall not allow a new employee or new subcontractor to begin work on CITY projects without a full and proper safety orientation. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage to prevent damage, injury or loss to:
1. All persons at the Site and other persons and organizations who may be affected thereby;
 2. All the WORK and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of the performance of the WORK.
- B. The CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property or to the protection of persons or property from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may effect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. CONTRACTOR'S duties and responsibilities for safety and for protection of the WORK shall continue until such time as all the

WORK is completed and ENGINEER has issued a notice to the CONTRACTOR in accordance with Paragraph 14.7 B. that the WORK is acceptable.

- C. The CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
- D. Materials that contain hazardous substances or mixtures may be required on the WORK. A Material Safety Data Sheet shall be made available at the Site by the CONTRACTOR for every hazardous product used.
- E. Material usage shall strictly conform to OSHA safety requirements and all manufacturer's warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.
- F. The CONTRACTOR shall be responsible for the exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.
- G. The CONTRACTOR shall notify the ENGINEER if it considers a specified product or its intended use to be unsafe. This notification must be given to the ENGINEER prior to the product being ordered, or if provided by some other party, prior to the product being incorporated in the WORK.
- H. Before starting work, the CONTRACTOR shall submit a written safety program to the CITY. The objective of the safety program shall be accident prevention. Such program shall include, but not be limited to, the following:
 - 1. An organization chart and accompanying narrative which describes the responsibility for employee and public safety of those individuals who control each phase of operations and set forth in writing the policies and procedures to be followed by all personnel. The chart shall also show the CONTRACTOR's internal lines of communication (including subcontractors) for the program.
 - 2. A specific program for communication between the CONTRACTOR and CITY on safety matters. The CONTRACTOR shall also designate one person with whom official contact can be made by the CITY on safety matters.
 - 3. Evidence that the CONTRACTOR has become thoroughly familiar with the potential hazards of the work and applicable federal and state regulations.

4. Specific safety procedures and guidelines for conduct of the Work.
5. The CITY's review, comment upon, and/or acceptance of the CONTRACTOR's safety program and/or plan does not in any way negate the responsibilities of the CONTRACTOR for safety or place any responsibility upon the CITY for such safety. Such review comment and/or acceptance shall not be construed as limiting in any manner the CONTRACTOR's obligation to undertake any action which may be necessary or required to establish and maintain safe working conditions at the site.

6.13 EMERGENCIES

- A. In emergencies affecting the safety or protection of persons or the WORK or property at the Site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER, is obligated to immediately act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the WORK or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Change Order will be issued to document the consequences of such action.

6.14 SUBMITTALS

- A. After checking and verifying all field measurements and after complying with applicable procedures specified in the Special Provisions, the CONTRACTOR shall submit to the ENGINEER for review all Shop Drawings and details of all structural and reinforcing steel, equipment, electrical controls, structural fabrications, pipe, pipe joints, special pipe sections, and other appurtenances in accordance with the accepted schedule of Shop Drawing submittals specified in the Special Provisions or as otherwise provided in the Contract Documents.
- B. The ENGINEER'S review will be only to determine if the items covered by the submittals will, after installation or incorporation in the WORK, generally conform to the Contract Documents and with the design concept of the completed Project. The ENGINEER's favorable review shall be obtained before any such items are manufactured or used in the work. The favorable review of Drawings by the ENGINEER shall apply in general design only and shall in no way relieve the CONTRACTOR from responsibility for errors or omissions contained therein. Favorable review by the ENGINEER shall not relieve the CONTRACTOR of its obligation to meet safety requirements and all other requirements of law. The ENGINEER will start reviewing the CONTRACTOR's submittals only after the

Notice to Proceed is issued by the CITY with the exception of some unusual long lead items which may require submittals prior to issuing the Notice to Proceed.

- C. The CONTRACTOR shall also submit to the ENGINEER for review all Samples in accordance with the accepted schedule of Sample submittals specified in the Special Provisions or as otherwise provided in the Contract Documents.
- D. Before submittal of each Shop Drawing or Sample, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the WORK and the Contract Documents. The CONTRACTOR shall provide submittals in accordance with the requirements of the Special Provisions or as otherwise provided in the Contract Documents.
- E. Shop-drawing submittal and coordination are the responsibility of the prime contractor; this responsibility shall not be delegated in whole or in part to subcontractors or suppliers. Any designation of work "by others," shown on Shop Drawings, shall mean that the work will be the responsibility of the CONTRACTOR rather than the subcontractor or supplier who has prepared the Shop Drawings.

Submittals shall be prepared in such form that data can be identified with the applicable Specification paragraph. The data shall demonstrate clearly compliance with the Drawings and Specifications and shall relate to the specific equipment to be furnished. Where manufacturer's standard drawings are employed, they shall be marked clearly to show what portions of the data are applicable to this Project.

- F. Review of shop-drawing submittals by the ENGINEER has as its primary objective the completion for the CITY of a Project in full conformance with the Drawings and Specifications, unmarred by field corrections, and within the time provided. In addition to this primary objective, shop-drawing review as a secondary objective will assist the CONTRACTOR in its procurement of equipment that will meet all requirements of the Drawings and Specifications, will fit the structures detailed on the Drawings, will be complete with respect to piping, electrical, and control connections, will have the proper functional characteristics, and will become an integral part of a complete operating facility. Acceptance of Shop Drawings and submittals does not constitute a change order to the Contract requirements.
- G. Where the CONTRACTOR is required by these Specifications to make submittals, they shall be submitted to the ENGINEER with a letter of transmittal and in sufficient number of copies to allow a distribution of at least one (1) copy to all parties needing a copy to carry out the provisions of the Specifications, including three (3) copies to be retained by the ENGINEER. The ENGINEER

shall determine the appropriate number of such copies required at the time of the preconstruction conference.

H. Within twenty-five (25) calendar days of receipt by the ENGINEER of each of the CONTRACTOR's submissions and all appurtenant data required for their review, the appropriate number of copies will be returned to the CONTRACTOR with one of the following notations:

1. Resubmittal not required; correction, if any, noted.
2. Correct and resubmit; corrections noted.

Returned copies of Drawings marked with Notation "1" authorize the CONTRACTOR to proceed with the operations covered by such returned copies, provided that such operations be subject to the comments, if any, shown on such returned copies. Returned copies of Drawings marked with Notation "2" shall be corrected, as necessary and required, and shall be submitted in the same manner as before.

I. When submittals are favorably reviewed, the ENGINEER will retain three (3) copies and will return all other copies to the CONTRACTOR. When submittals are not favorably reviewed, the ENGINEER will retain only two (2) copies and will return all others to the CONTRACTOR. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable submission to the ENGINEER at least by the second submission of data. The CITY reserves the right to deduct monies from payments due the CONTRACTOR to cover additional costs of the ENGINEER's review beyond the second submission.

J. Favorable review by the ENGINEER will not constitute acceptance by the ENGINEER of any responsibility for the accuracy, coordination, and completeness of the Shop Drawings or the items of equipment represented on the Drawings. Accuracy, coordination, and completeness of Shop Drawings shall be the sole responsibility of the CONTRACTOR, including responsibility to back check comments, corrections, and modifications from the ENGINEER's review before fabrication. Supplemental, specific requirements for Shop Drawings and details are contained in the applicable technical sections of these Specifications.

K. Copies of schedules and Shop Drawings submitted to the ENGINEER for review shall be such as to provide three (3) copies for the ENGINEER's files, and such additional copies as the CONTRACTOR may desire for its own office files and/or for distribution by it to subcontractors or vendors. Exceptions will be noted in specific sections of Specifications. All Shop Drawings and supporting data, catalogs, and schedules shall be submitted as the instruments of the CONTRACTOR, who shall be responsible for their accuracy and completeness. These submittals may be prepared by the CONTRACTOR, subcontractors, or suppliers, but the CONTRACTOR shall ascertain that submittals meet all of the

requirements of the Contract, while conforming to structural, space, and access conditions at the point of installation. The CONTRACTOR shall check all submittals before submitting them to the ENGINEER.

- L. The ENGINEER shall check and review schedules, drawings, etc., submitted by the CONTRACTOR only for general design conformance with the concept of the Project and compliance with the Contract. Shop Drawings shall not be used to order products' fabrication or delivery for construction or installation unless submitted to and favorably reviewed by the ENGINEER. Acceptance by the ENGINEER of any drawings, method of work, or any information regarding materials and equipment the CONTRACTOR proposes to furnish shall not relieve the CONTRACTOR of its responsibility for any errors therein and shall not be regarded as an assumption of risks or liability by the Design ENGINEER or the CITY, or any officer or employee thereof, and the CONTRACTOR shall have no recourse against the CITY under the Contract on account of the failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Such acceptance shall be considered to mean merely that the ENGINEER has no objection to the CONTRACTOR using, upon its own full responsibility, the plan or method of work proposed or furnishing the materials and equipment proposed.

6.15 CONTINUING THE WORK

- A. The CONTRACTOR shall carry on the WORK and adhere to the progress schedule during all disputes or disagreements with the CITY. No WORK shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the CITY may otherwise agree in writing.

6.16 CONTRACTOR'S GENERAL WARRANTY AND GUARANTEE

- A. CONTRACTOR warrants and guarantees that all WORK will be in accordance with the Contract Documents and will not be defective. The CONTRACTOR represents that the WORK performed pursuant to the Contract shall be of the quality specified or of the highest quality if no quality is specified, and shall conform to the Contract Documents. The CONTRACTOR warrants all equipment, material, products, and workmanship furnished and all work performed under the Contract against defects for a period of one (1) year after final acceptance regardless of whether the same were furnished or performed by the CONTRACTOR or by any of its subcontractors or suppliers of any tier.
- B. The CONTRACTOR shall make, at its own expense, all repairs and/or replacements necessitated by defects in the equipment, materials, and/or products and in the workmanship provided by the CONTRACTOR or any of its subcontractors that become evident within the warranty period.

- C. Upon receipt of written notice from the CITY of any breach of warranty during the applicable warranty period, the affected item shall be redesigned, repaired, or replaced by the CONTRACTOR and the CONTRACTOR shall perform such tests as the CITY may require to verify that such redesign, repair, and replacement comply with the requirements of the Contract. The CITY shall have the right to operate and use such equipment, materials, and/or products until they can, without damage to the CITY, be taken out of service for correction or replacement by the CONTRACTOR. As to the redesigned, repaired, or replaced work, the CONTRACTOR warrants such redesigned, repaired, or replaced work against defective design, equipment, materials, products, and workmanship for a period of one (1) year from and after the date of satisfactory completion of such redesigned, repaired, or replaced work. The CITY reserves the right to require that the CONTRACTOR performs such repair or replacement work.
- D. The CITY also reserves the right to make such repairs or replacements, if, within seven (7) calendar days after the mailing of a notice in writing to the CONTRACTOR and Surety, the CONTRACTOR shall neglect to make or undertake with due diligence the aforesaid repairs or replacements and that Surety within seven (7) calendar days after mailing of a notice in writing of such negligence of the CONTRACTOR shall neglect to make or undertake with due diligence the aforesaid repairs or replacements itself, provided, however, that in the case of an emergency where in the opinion of the CITY delay would cause hazard to health or serious loss or damage, repair may be made without notice being sent to the CONTRACTOR or Surety, and the CONTRACTOR shall pay the cost thereof.
- E. All costs including workforce and materials incidental to such redesign, repair, replacement, and testing, including the removal, replacement, and reinstallation of equipment necessary to gain access and all other costs incurred as the result of a breach of warranty shall be borne by the CONTRACTOR whether performed by the CITY or the CONTRACTOR.
- F. Nothing in this section shall be construed to limit, relieve, or release the CONTRACTOR, subcontractor's, and equipment, materials, and/or products suppliers, and other service providers' liability to the CITY for damages sustained as the result of latent defects in the workmanship, equipment, materials, and/or products done and/or furnished by the CONTRACTOR, its subcontractors, suppliers and/or other service providers.
- G. The Performance Bond shall extend for a period of one (1) year after acceptance of the Contract by the CITY and shall cover the CONTRACTOR's obligations resulting from the warranty requirements herein specified.
- H. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. Abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, or Suppliers, or other individual or entity for whom CONTRACTOR is responsible;
 2. Normal wear and tear under normal usage.
- I. CONTRACTOR's obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of WORK that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents:
1. Observations by ENGINEER;
 2. Recommendation by ENGINEER or payment by CITY of any progress or final payment;
 3. The issuance of a Certificate of Completion by the CITY;
 4. Use or occupancy of the WORK or any part thereof by the CITY;
 5. Any acceptance by CITY or any failure to do so;
 6. Any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice or acceptability by ENGINEER pursuant to Paragraph 14.7 B.;
 7. Any inspection, test, or approval by others; or
 8. Any correction of Defective Work by CITY.

6.17 INDEMNIFICATION

- A. Contractor shall indemnify, defend with counsel acceptable to City, and hold harmless to the full extent permitted by law, City and its officers, officials, employees, agents and volunteers from and against any and all liability, loss, damage, claims, expenses and costs (including, without limitation, attorney fees and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with Contractor's performance of the WORK or its failure to comply with any of its obligations contained in this Agreement, except such Liability caused by the active negligence, sole negligence or willful misconduct of the City. Such indemnification by the CONTRACTOR shall include, but not be limited to, the following:
1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR, its subcontractors, employees, or

agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR, its employees, or agents;

2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the CONTRACTOR's, or Supplier's own employees, or agents engaged in the WORK resulting in actions brought by or on behalf of such employees against the CITY and/or the ENGINEER;
3. Liability or claims arising directly or indirectly from or based on the violation of any Laws or Regulations, whether by the CONTRACTOR, its subcontractors, employees, or agents;
4. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its subcontractors, employees, or agents in the performance of this Agreement of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specified stipulated in this Agreement;
5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the CITY or any other parties by the CONTRACTOR, its subcontractors, employees, or agents;
6. Liability or claims arising directly or indirectly from the willful misconduct of the CONTRACTOR, its subcontractors, employees, or agents;
7. Liability or claims arising directly or indirectly from any breach of the obligations assumed in this Agreement by the CONTRACTOR;
8. Liability or claims arising directly or indirectly from, relating to, or resulting from a hazardous condition created by the CONTRACTOR, Subcontractors, Suppliers, or any of their employees or agents, and;
9. Liability or claims arising directly, or indirectly, or consequentially out of any action, legal or equitable, brought against the CITY, the ENGINEER, their consultants, subconsultants, and the officers, directors, employees and agents of each or any of them, to the extent caused by the CONTRACTOR's use of any premises acquired by permits, rights of way, or easements, the Site, or any land or area contiguous thereto or its performance of the WORK thereon.

- B. The CONTRACTOR shall reimburse the CITY for all costs and expenses, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs of appeal) incurred by said CITY in enforcing the provisions of this Paragraph.
- C. The indemnification obligation under this Article 11 shall not be limited in any way by any limitation on the amount or type of insurance carried by CONTRACTOR 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 workers' compensation acts, disability benefit acts, or other employee benefit acts.
- D. Pursuant to California Public Contract Code Section 9201, City shall timely notify Contractor of receipt of any third-party claim relating to this Agreement.

6.18 CONTRACTOR'S DAILY REPORTS

- A. The CONTRACTOR shall complete a daily report indicating location worked, total manpower for each construction trade, major equipment on Site, each Subcontractor's manpower and equipment, weather conditions, and other related information involved in the performance of the WORK. These components will be decided by the ENGINEER.

6.19 CONTRACT DOCUMENTS AND RECORD DRAWINGS

- A. The CONTRACTOR shall keep on the work site a copy of the Contract Documents and shall at all times give the ENGINEER access thereto. Any drawings included in the Specifications shall be regarded as part thereto and of the Contract. Anything mentioned in these Specifications and not shown on the Project Drawings, or shown on the Project Drawings and not mentioned in these Specifications, shall be of like effect as though shown or mentioned in both. The ENGINEER will furnish from time to time such detail drawings, plans, profiles, and information as he may consider necessary for the CONTRACTOR's guidance. It shall be the duty of the CONTRACTOR to see that the provisions of the Contract Documents are complied with in detail irrespective of the inspection given the work during its progress by the ENGINEER. Any failure on the part of the CONTRACTOR to observe the requirements contained in the Contract Documents will be sufficient cause for the rejection of the work at any time before its acceptance.
- B. The CONTRACTOR shall maintain, at the jobsite, one record set of Drawings in good order and clearly marked to show any deviations which have been made from the Drawings, including concealed construction and utility features which are revealed during the course of construction. Marked prints shall be updated at least once each week and shall be available to the ENGINEER for review as to

currency prior to developing partial payment estimates. Upon completion of the work, the marked set of prints shall be delivered to the ENGINEER.

- C. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the Record Drawings shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.
- D. Requests for partial payments will not be approved if the updated set of Drawings is not in good order or is not kept current. Request for final payment will not be approved until the complete and correct Record Drawings are delivered to the ENGINEER.

6.20 CLEAN UP

The CONTRACTOR shall, at all times, keep the premises, occupied by it in relation to this Contract, in a neat, clean, and safe condition and at all times provide reasonable access thereto. The CONTRACTOR shall, as a minimum, conduct daily inspections to verify that requirements of this Article are being met.

- A. During the progress of the WORK, the CONTRACTOR shall:
 - 1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of material.
 - 2. Provide adequate storage of all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the environment.
 - 3. Remove any accumulation of scrap, debris, waste material, and other items not required for construction of this work.
 - 4. Dispose of existing materials and equipment to be demolished and removed and all trash such as broken concrete, wood blocking, shipping containers, etc., resulting from the contract work off the premises occupied by the CONTRACTOR, including CITY property, at the CONTRACTOR's expense. CITY-leased dumpsters and other disposal containers on CITY's property, unless specifically provided by the CONTRACTOR, shall not be used by the CONTRACTOR.
 - 5. Maintain all excavation, embankments, haul roads, permanent access roads, Plant site, waste disposal areas, borrow areas, and all other work areas within contract work limits free from dust, as determined by the

ENGINEER. Industry-accepted methods of dust control suitable for the area involved, such as sprinkling, chemical treatment, light bituminous treatment, or similar methods, will be permitted. No separate payment will be made to the CONTRACTOR for dust control.

- B. If the CONTRACTOR fails to comply with any of the foregoing, the CITY will transmit written notification of noncompliance. If, within five (5) calendar days of the written notification, the CONTRACTOR fails to comply, cleanup may be undertaken by the CITY at the expense of the CONTRACTOR.
- C. Upon completion of any portion of any WORK, the CONTRACTOR shall promptly remove all of its equipment, temporary structures, and surplus construction and other materials not to be used at or near the same location during later stages of work. Upon completion of any WORK and before final inspection is made, the CONTRACTOR shall unless otherwise specifically directed by the ENGINEER:
 - 1. Remove from the job site all plant, buildings, tools, surplus materials, equipment, forms, rubbish, scrap, debris, and waste.
 - 2. Clean all paved areas on the site. Completely remove all resultant debris.
 - 3. Visually inspect all interior surfaces, and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only approved cleaning materials and equipment.
 - 4. Restore any improved area used for the CONTRACTOR's work or material storage to its condition at the time the CONTRACTOR moved onto the site or to the satisfaction of the ENGINEER.
 - 5. Schedule final cleaning and improvement restoration to enable the CITY to accept a completely clean and restored project.

6.21 STORM WATER POLLUTION PREVENTION

A. General

- 1. Prevention - The CONTRACTOR shall prevent the pollution of storm drain systems and creeks on or near the construction project site(s) resulting from the construction operation. The CONTRACTOR shall keep pollution out of storm drains by reducing the possibility of accidental discharge of materials and wastes, by reducing erosion and sedimentation, and by any action as required. The CONTRACTOR shall train all employees and subcontractors on the storm water pollution prevention

requirements contained in these Specifications and ensure that all employees and subcontractors are aware of the consequences as described in subsection A.3. below. The CONTRACTOR shall include appropriate subcontract provisions to ensure that these requirements are met by all subcontractors.

2. Notification - If the CONTRACTOR causes or permits the spillage or overflow of any sewage, oil, or petroleum product, hazardous substance, contaminant, or waste that may result in the fluid or substance being discharged directly or indirectly into any storm drains, creeks, wetlands, or other manmade or natural waterways the CONTRACTOR shall notify the CITY as soon as possible to the extent notification can be provided without substantially impeding cleanup or other emergency measures. In no event shall such notification be later than one hour after knowledge of the occurrence.
3. Cleanup - Immediately upon gaining knowledge of such spillage, overflow, or discharge, the CONTRACTOR shall eliminate the cause of the spillage, overflow, or discharge and take action to minimize any damages. The CONTRACTOR shall also immediately implement a cleanup program. The cleanup, including sampling and testing required by regulatory agencies to determine the nature and level of contamination shall be performed and completed to the satisfaction of the various regulatory agencies involved and the CITY, at the expense of the CONTRACTOR. Any fines, penalties, and/or subsequent actions imposed upon the CITY and/or the CONTRACTOR by regulatory agencies related to the spillage, overflow, or discharge and any subsequent monitoring, testing, and reporting, as required by regulatory agencies, shall also be at the expense of the CONTRACTOR. The CONTRACTOR shall keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on site. The quantity of cleanup materials shall be appropriate in consideration of the risk of an occurrence of a spill, overflow or discharge.

B. Management of Nonhazardous Material and/or Waste

1. Designated Area - The CONTRACTOR shall propose designated areas of the project site, for approval by the ENGINEER, suitable for material delivery, storage, and waste collection that to the maximum extent practicable are near construction entrances and away from catch basins, gutters, drainage courses, and creeks.
2. Backfill or Excavated Material - The CONTRACTOR shall not allow backfill or excavated material to enter the storm drains or creeks. When rain is forecast within 24 hours or during wet weather, the

CONTRACTOR may be required to cover such material with a tarpaulin and to surround the material with sand bags.

3. Street Sweeping - At least once per week or more frequently as directed by the ENGINEER, the CONTRACTOR shall clean and sweep roadways and on-site paved areas of all materials attributed to or involved in the work. The CONTRACTOR shall not use water to flush down streets in place of street sweeping.
4. Disposal - At the end of each working day, the CONTRACTOR shall collect all scrap, debris, and waste material, and dispose of such materials properly. The materials may be stored in the CONTRACTOR's yard in stockpiles or placed in dumpsters. The CONTRACTOR shall inspect dumpsters for leaks and replace or repair dumpsters that leak. The CONTRACTOR shall not discharge water from cleaning dumpsters on site. The CONTRACTOR shall arrange for regular waste collection before dumpsters overflow.

C. Management of Hazardous Material and/or Waste

1. Storage - The CONTRACTOR shall label and store all hazardous materials, such as pesticides, paints, thinners, solvents, and fuels, and all hazardous wastes, such as waste oil and antifreeze in accordance with all applicable state and federal regulations. The CONTRACTOR shall store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations. All such materials and wastes shall be covered, as needed, to avoid rainwater becoming polluted with hazardous constituents which could result in potential management of collected rain water as a hazardous waste. The CONTRACTOR shall keep an accurate, up-to-date inventory, including Material Safety Data Sheets (MSDSs), of hazardous materials and hazardous wastes stored on site.
2. Usage - When rain is forecast within 24 hours or during wet weather, the CONTRACTOR shall refrain from applying chemicals in outside areas. The CONTRACTOR shall follow material manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals. The CONTRACTOR shall post warning signs in areas treated with chemicals.
3. Disposal - The CONTRACTOR shall arrange for regular hazardous waste collection to comply with time limits on storage of hazardous wastes. The CONTRACTOR shall dispose of hazardous waste in accordance with all applicable local, state and federal regulations. The CONTRACTOR shall not wash any spilled material into streets, gutters, storm drains, or creeks and shall not bury spilled hazardous materials. The CONTRACTOR shall

report any hazardous materials spill to the CITY in accordance with Section A.2 above.

D. Vehicle/Equipment Cleaning, Maintenance, and Fueling

1. General - The CONTRACTOR shall inspect vehicles and equipment arriving on site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repairs are made.

The CONTRACTOR shall comply with federal, state, and city requirements for aboveground storage tanks.

2. Cleaning - The CONTRACTOR shall perform vehicle or equipment cleaning with water only in a designated, bermed area that will not allow rinse water to run off site into streets, gutters, storm drains, or creeks. Soaps, solvents, degreasers, steam-cleaning equipment, or equivalent methods shall not be allowed.
3. Maintenance and Fueling - The CONTRACTOR shall perform maintenance and fueling of vehicles or equipment in areas that will not allow run-on of storm water or runoff of spills to storm drains and provide for confined clean-up. Examples are working in bermed areas or utilizing drip pans. The CONTRACTOR shall not contaminate the soils or groundwater with such maintenance and fueling activities.

The CONTRACTOR shall use secondary containment, such as a drip pan, to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed, or poured, and shall clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as hazardous waste, as described in Section C.3 above.

E. Dewatering Operations

1. Sediment Control - The CONTRACTOR shall route water through a control measure, such as a sediment trap, sediment basin, or Baker tank, to remove settleable solids prior to discharge to the storm drain system. Straw bales shall be placed in front of storm drain inlets as required. Filtration of the water following the control measure may be required on a case-by-case basis. Approval of the control measure shall be obtained in advance from the ENGINEER. If the ENGINEER determines that the dewatering operation would not generate an appreciable amount of settleable solids, the control measure requirement above may be waived.
2. Contaminated Groundwater - If the project is within an area of known groundwater contamination or if contamination is found, water from

dewatering operations shall be tested prior to discharge. If the water quality meets Regional Water Quality Control Board (RWQCB) standards, it may be discharged to a storm drain or creek. Otherwise, the water shall be hauled off site for proper disposal.

F. Paving or Oiling Operations

1. When rain is forecast within 24 hours or during wet weather, the ENGINEER may prevent the CONTRACTOR from paving or oiling the street. The ENGINEER may direct the CONTRACTOR to protect drainage courses by using control measures, such as earth dike, straw bale, and sand bag, to divert runoff or trap and filter sediment.
2. The CONTRACTOR shall prevent saw-cut slurry from entering catch basins and storm drains by limiting the area over which the slurry may spread.
3. The CONTRACTOR shall cover catch basins and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.
4. The CONTRACTOR shall not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, or creeks. The CONTRACTOR shall either collect the sand and return it to the stockpile or dispose of it in a trash container.

G. Concrete, Grout, and Mortar Waste Management

1. Concrete Truck/Equipment Washout - The CONTRACTOR shall not wash out concrete trucks or equipment into streets, gutters, storm drains, or creeks. The CONTRACTOR shall perform washout of concrete trucks or equipment off site or in a designated area on site where the water will flow onto dirt or into a temporary pit in a dirt area. The CONTRACTOR shall let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, the CONTRACTOR shall collect the wash water and remove it off site.
2. Exposed Aggregate Concrete Wash Water - The CONTRACTOR shall avoid creating runoff by draining water from washing of exposed aggregate concrete to a dirt area. If a suitable dirt area is not available, the CONTRACTOR shall filter the wash water through straw bales or equivalent material before discharging to a storm drain. The CONTRACTOR shall collect sweepings from exposed aggregate concrete for disposal.

H. Paint Disposal and Clean-up

1. Disposal of Unused Paint - The CONTRACTOR shall carefully use, store and dispose of paint, solvents, chemicals, and waste materials in compliance with all applicable state and federal regulations. The CONTRACTOR shall not dispose of paint to sanitary sewer systems or storm drains. The CONTRACTOR shall utilize other recycling and disposal services as follows:
 - a. "Recycling Centers" and "Waste Disposals" as may be listed in the yellow pages.
 - b. Local household hazardous waste facility if appropriate.

The CONTRACTOR may dispose of small amounts of leftover latex (water-based) paint by applying the paint to the surface of an item to be discarded and allowing it to dry thoroughly, then disposing of it in a dumpster.

The CONTRACTOR shall store these materials and conduct cleaning of painting equipment and tools in a designated area that will not allow run-on of storm water or runoff of spills. The CONTRACTOR shall not allow wash water from cleaning of painting equipment and tools into streets, gutters, storm drains, or creeks.

2. Disposal of Paint Clean-up Waste - The CONTRACTOR shall remove as much excess paint as possible from brushes, rollers, and equipment before starting cleanup.
 - a. The CONTRACTOR shall not discharge cleaning wastes from oil-based paints, buckets, brushes or tools to the sanitary sewer system. The CONTRACTOR shall retain a certified waste hauler to recycle or to dispose of cleaning wastes from oil-based paints at the CONTRACTOR's expense.
 - b. The CONTRACTOR may discharge very small amounts of cleaning wastes from brushes, rollers, buckets, and tools contaminated with latex (water-based) paints to the sanitary sewer system provided they do not contain additives with pollutants of concern (e.g., mercury, tributyltin). Brushes, rollers, and tools containing latex paints may be washed over a sink with plenty of water. Buckets containing latex paints shall first be emptied into the original can or discarded as specified in paragraph 1 above. Should excessive amounts of paint or solvent be found in the wastewater discharged, the CONTRACTOR may be subject to

enforcement action by the CITY in accordance with the City Codes.

- c. The CONTRACTOR shall not discharge any of these paint clean-up wastes to storm drains, streets, gutters, or creeks.
 - d. Waste Disposal - The CONTRACTOR shall dispose of waste thinner, solvent, and sludge from cleaning of equipment and tools as hazardous waste, as described in Section C.3 above. The CONTRACTOR shall dispose of excess thinners, solvents, and oil- and water-based paint as hazardous waste.
- I. Contaminated Soil - If the project is within an area of known soil contamination or evidence of soil contamination is found, the CONTRACTOR shall comply with the requirements of all applicable local, state and federal regulations.

ARTICLE 7 – OTHER WORK

7.1 RELATED WORK AT SITE

- A. The CITY may perform other work related to the Project at the Site by the CITY's own forces, have other work performed by utility owners, or let other direct contracts for such other work. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work.
- B. The CONTRACTOR shall afford each person who is performing the other work (including the CITY's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the WORK with theirs. The CONTRACTOR shall do all cutting, fitting, and patching of the WORK that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will not only cut or alter their work with the written consent of the ENGINEER and the others whose work will be affected.
- C. If the proper execution or results of any part of the CONTRACTOR's work depends upon such other work by another, the CONTRACTOR shall inspect and report to the ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to report such delays, defects, or deficiencies will constitute an acceptance of the other work as fit and proper for integration with the CONTRACTOR's work except for latent or nonapparent defects and deficiencies in the other work.

7.2 COORDINATION

- A. If the CITY contracts with others for the performance of other work at the Site, CITY will have sole authority and responsibility in respect of such coordination, unless otherwise provided in the Supplementary General Conditions.

ARTICLE 8 – CITY’S RESPONSIBILITIES

8.1 COMMUNICATIONS

- A. Except as may be otherwise provided in these General Conditions or the Supplementary General Conditions, the CITY will issue all its communications to the CONTRACTOR through the ENGINEER.

8.2 PAYMENTS

- A. The CITY will make payments to the CONTRACTOR as provided in Article 14.

8.3 LANDS, EASEMENTS, AND SURVEYS

- A. The CITY’s duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.1 and 4.6.

8.4 REPORTS AND DRAWINGS

- A. The CITY will identify and make available to the CONTRACTOR copies of reports of physical conditions at the Site and drawings of existing structures which have been utilized in preparing the Contract Documents as set forth in Paragraph 4.2.

8.5 CHANGE ORDERS

- A. The CITY will execute Change Orders as indicated in Article 10.

8.6 INSPECTIONS AND TESTS

- A. The CITY’S responsibility for inspections and tests is set forth in Paragraph 13.3.

8.7 SUSPENSION OF WORK

- A. The CITY’s right to stop work or suspend work is set forth in Paragraphs 13.4 and 15.1.

8.8 TERMINATION OF AGREEMENT

- A. The CITY's right to terminate services of the CONTRACTOR is set forth in Paragraphs 15.2 and 15.3.

8.9 LIMITATION ON CITY'S RESPONSIBILITIES

- A. The CITY shall not supervise, direct or have control or authority over, nor be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the WORK. CITY will not be responsible for CONTRACTOR's failure to perform or furnish the WORK in accordance with the Contract Documents.

8.10 UNDISCLOSED HAZARDOUS ENVIRONMENTAL CONDITIONS

- A. CITY's responsibility in respect to an undisclosed hazardous environmental condition is set forth in Paragraph 4.5.

ARTICLE 9 – ENGINEER’S STATUS DURING CONSTRUCTION

9.1 CITY’S REPRESENTATIVE

- A. The ENGINEER will be the CITY’S representative during the construction period. The ENGINEER shall decide any and all questions which may arise as to the quality or acceptability of materials furnished and work performed, and as to the manner of performance and rate of progress of the work; all questions which arise as to the interpretation of the plans and specifications, the proposal and the contract documents therefor; all questions as to the acceptable fulfillment of the contract on the part of the CONTRACTOR; and all questions as to claim and compensation.

9.2 OBSERVATIONS ON THE SITE

- A. The ENGINEER will make observations on the Site during construction to monitor the progress and quality of the WORK and to determine, in general, if the WORK is proceeding in accordance with the Contract Documents. The ENGINEER will not be required to make exhaustive or continuous inspections to check the quality or quantity of the WORK.

9.3 PROJECT REPRESENTATION

- A. The ENGINEER may furnish a Resident Project Representative to assist in observing the performance of the WORK. The duties, responsibilities, and limitations of authority of any such Resident Project Representative will be as provided in the Supplementary General Conditions.

9.4 CLARIFICATIONS

- A. The ENGINEER will issue with reasonable promptness such written Clarifications of the requirements of the Contract Documents as the ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

9.5 AUTHORIZED VARIATIONS IN WORK

- A. The ENGINEER may authorize variations in the WORK from the requirements of the Contract Documents. These may be accomplished by a Field Order and will require the CONTRACTOR to perform the WORK involved in a manner that minimizes the impact to the WORK and the Contract Times. If the CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Times, the CONTRACTOR may make a claim therefor as provided in Article 11 or 12.

9.6 REJECTING DEFECTIVE WORK

- A. The ENGINEER will have authority to reject Defective Work and will also have authority to require special inspection or testing of the WORK as provided in Article 13.

9.7 CONTRACTOR SUBMITTALS, CHANGE ORDERS, AND PAYMENTS

- A. In accordance with the procedures set forth in the General Requirements, the ENGINEER will review all CONTRACTOR submittals.
- B. The ENGINEER's responsibilities for Change Orders are set forth in Articles 10, 11, and 12.
- C. The ENGINEER's responsibilities for Applications for payment are set forth in Article 14.

9.8 DECISIONS ON DISPUTES

- A. The ENGINEER will be the initial interpreter of the requirements of the Contract Documents and of the acceptability of the WORK thereunder. Claims, disputes, and other matters relating to the acceptability of the WORK and interpretation of the requirements of the Contract Document pertaining to the performance of the work shall be determined by the ENGINEER. Any claims in respect to changes in the Contract Price or Contract Times shall be resolved in accordance with the requirements set forth in Articles 10, 11, and 12.

9.9 LIMITATIONS ON ENGINEER'S RESPONSIBILITIES

- A. Neither the ENGINEER's authority to act under this Article 9 or other provisions of the Contract Documents nor any decision made by the ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ENGINEER to the CONTRACTOR, any Subcontractor, any Supplier, any surety for any of them, or any other person or organization performing any of the WORK.
- B. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory," or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment will be solely to evaluate the WORK for compliance with the requirements of the Contract Documents, and conformance with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to the ENGINEER any duty or authority

to supervise or direct the performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9 C.

- C. The ENGINEER will not supervise, direct, control, or have authority over or be responsible for the CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the CONTRACTOR to comply with Laws and Regulations applicable to the performance of the WORK. The ENGINEER will not be responsible for the CONTRACTOR's failure to perform the WORK in accordance with the Contract Documents. The ENGINEER will not be responsible for the acts or omissions of the CONTRACTOR nor of any Subcontractor, Supplier, or any other person or organization performing any of the WORK.

ARTICLE 10 – CHANGES IN THE WORK

10.1 GENERAL

- A. Without invalidating the Agreement and without notice to any surety, the CITY may at any time or from time to time, order additions, deletions, or revisions in the WORK. Such additions, deletions or revisions will be authorized by a Change Order or Field Order. Upon receipt of any such document, CONTRACTOR shall promptly proceed to implement the additions, deletions, or revisions in the WORK in accordance with the applicable conditions of the Contract Documents.
- B. The CONTRACTOR shall not be entitled to an increase in the contract Price nor an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented by Change Order, except in the case of an emergency and except in the case of uncovering work as provided in Paragraph 13.3.F and G.
- C. The CITY and the CONTRACTOR shall execute appropriate Change Orders covering:
 - 1. Changes in the WORK which are ordered by the CITY pursuant to Paragraph 10.1 A.;
 - 2. Changes required because of acceptance of Defective Work under Paragraph 13.6; and
 - 3. Changes in the Contract Price or Contract Times which are agreed to by the parties under Articles 11 and/or 12, respectively.
- D. If notice of any change in the WORK is required to be given to a surety, the giving of any such notice shall be the CONTRACTOR's responsibility. If the change in the WORK affects the Contract Price, the CITY may require an

adjustment to the amount of any applicable Bond and the amount of each applicable Bond shall be adjusted accordingly.

- E. If the CITY and CONTRACTOR agree as to the extent, if any, of an increase in the Contract Price or an extension or shortening of the Contract Times that should be allowed as a result of a Field Order, the CONTRACTOR shall proceed so as to minimize the impact on and delays to the WORK pending the issuance of a Change Order.
- F. If the CITY and the CONTRACTOR are unable to agree as to the extent, if any, of an increase in the Contract Price or an extension or shortening of the Contract Times that should be allowed as a result of a Field Order, the ENGINEER can direct the CONTRACTOR to proceed on the basis of time and materials so as to minimize the impact on and delays to the WORK, and the CONTRACTOR may make a claim as provided in Articles 11 and 12.

10.2 ALLOWABLE QUANTITY VARIATIONS

- A. In the event of an increase or decrease in the quantity of any bid item under a unit price contract, the total amount of work actually done or materials or equipment furnished will be paid for according to the unit price established for such work under the Contract Documents, wherever such unit price has been established; provided, that an adjustment in the Contract Price may be made for changes which result in an increase or decrease in excess of 25 percent of the estimated quantity of any unit price bid item of the WORK.
- B. In the event a part of the WORK is to be entirely eliminated and no lump sum or unit price is named in the Contract Documents to cover such eliminated work, the price of the eliminated work shall be agreed upon by the CITY and the CONTRACTOR by Change Order.

ARTICLE 11 – CHANGE OF CONTRACT PRICE

11.1 GENERAL

- A. The Contract Price constitutes the total compensation payable to the CONTRACTOR FOR PERFORMING THE work. All duties, responsibilities, and obligations assigned to or undertaken by the CONTRACTOR to complete the WORK shall be at its expense without change in the Contract Price.
- B. The Contract Price may only be changed by a Change Order. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.
 2. By mutual acceptance of a lump sum, which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.4; or
 3. On the basis of the cost of work (determined as provided in Paragraph 11.3) plus the CONTRACTOR's overhead and profit (determined as provided in Paragraph 11.4).
- C. Any claim for an increase in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 10 days) after the start of the event giving rise to the claim and shall state the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within 60 days after the start of such event (unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of such event. All claims for adjustment in the Contract Price will be determined by the ENGINEER. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this Paragraph 11.1 C.

11.2 COSTS RELATING TO WEATHER

- A. The CONTRACTOR shall have no claims against the CITY for damages for any injury to work, materials, or equipment, resulting from the action of the elements. If, however, in the opinion of the ENGINEER, the CONTRACTOR has made all reasonable efforts to protect the materials, equipment, and work, the CONTRACTOR may be granted a reasonable extension of Contract Times to make proper repairs, renewals, and replacements of the work, materials, or equipment.

11.3 COST OF WORK (BASED ON TIME AND MATERIALS)

- A. **General:** The term "cost of work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR for labor, materials, and equipment in the proper performance of extra work. Except as otherwise may be agreed to in writing by the CITY, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in Paragraph 11.5.
- B. **Labor:** The costs of labor will be the actual cost for wages prevailing for each craft or type of workers performing the extra work at the time the extra work is

done, plus employer payments of payroll taxes, workers compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from federal, state or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. Labor costs for equipment operators and helpers will be paid only when such costs are not included in the invoice for equipment rental. The labor costs for foremen shall be proportioned to all of their assigned work and only that applicable to extra work shall be paid. Nondirect labor costs including superintendence shall be considered part of the markup set out in Paragraph 11.4.

C. **Materials:** Materials must be specifically authorized by the ENGINEER. The cost of materials reported shall be at invoice or lowest current price at which materials are locally available and delivered to the Site in the quantities involved, plus the cost of freight, delivery and storage, subject to the following:

1. All trade discounts and rebaters shall accrue to the CITY, and the CONTRACTOR shall make provisions so that they may be obtained;
2. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the ENGINEER. Except for actual costs incurred in the handling of such materials, markup will not be allowed;
3. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on extra work items or the current wholesale price for such materials delivered to the Site, whichever price is lower; and
4. If in the opinion of the ENGINEER the cost of material is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the Site less trade discount. The CITY reserves the right to furnish materials for the extra work and no claim will be allowed by the CONTRACTOR for costs and profit on such materials.

D. **Equipment:** The CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the current California Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates." Such rental rate will be used to compute payments for equipment whether the equipment is under the CONTRACTOR's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment will be the rate resulting in the least total cost to the CITY for the total period of use. If it is deemed necessary by the CONTRACTOR to use equipment not listed in the above-

referenced publication, an equitable rental rate for the equipment will be established by the ENGINEER. The CONTRACTOR may furnish cost data which might assist the ENGINEER in the establishment of the rental rate. Payment for equipment shall be subject to the following:

1. All equipment shall, in the opinion of the ENGINEER, be in good working condition and suitable for the purpose for which the equipment is to be used;
2. Before construction equipment is used on the extra work, the CONTRACTOR shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the ENGINEER, in duplicate, a description of the equipment and its identifying number;
3. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer;
4. Individual pieces of equipment or tools having a replacement value of \$500 or less, whether or not consumed by use, will be considered to be small tools and no payment will be made therefore.

E. **Equipment Rental Time:** The rental time to be paid for equipment on the Site will be the time the equipment is in productive operation on the extra work being performed and, in addition, will include the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original location; except, that moving time will not be paid if the equipment is used on other than the extra work, even though located at the Site of the extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made for loading and transporting costs when the equipment is used at the Site of the extra work on other than the extra work. Rental time will not be allowed while equipment is inoperative due to breakdowns. The rental time of equipment on the work Site will be computed subject to the following:

1. When hourly rates are listed, any part of an hour less than 30 minutes of operation will be considered to be half-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation;
2. When daily rates are listed, any part of a day less than 4 hours operation will be considered to be half-day of operation. When owner-operated equipment is used to perform extra work to be paid for on a time and

materials basis, the CONTRACTOR will be paid for the equipment and operator, as set forth in Paragraphs 3, 4, and 5, following;

3. Payment for the equipment will be made in accordance with the provisions in Paragraph 11.3 D., herein;
4. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the CONTRACTOR to other workers operating similar equipment already on the Site, or in the absence of such labor, established by collective bargaining agreements for the type of workmen and location of the extra work, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein accordance with the provisions of Paragraph 11.3 B., herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all other payments made to or on behalf of workers other than actual wages; and
5. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Paragraph 11.4, herein.

F. **Special Services:** Special work or services are defined as that work characterized by extraordinary complexity, sophistication, innovation, or a combination of the foregoing attributes which are unique to the construction industry. The ENGINEER will make estimates for payment for special services and may consider the following:

1. When the ENGINEER and the CONTRACTOR, determine that a special service or work is required which cannot be performed by the forces of the CONTRACTOR or those of any of its Subcontractors, the special service or work may be performed by an entity especially skilled in the work to be performed. After validation of invoices and determination of market values by the ENGINEER, invoices for special services or work based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs;
2. When the CONTRACTOR is required to perform work necessitating special fabrication or matching process in a fabrication or a machine shop facility away from the Site, the charges for that portion of the work performed at the off-site facility may, by agreement, be accepted as a special service and accordingly, the invoices for the work may be accepted without detailed itemization; and
3. All invoices for special services will be adjusted by deducting all trade discounts. In lieu of the allowances for overhead and profit specified in

Paragraph 11.4, herein, an allowance of 15 percent will be added to invoices for special services.

- G. **Sureties;** All work performed hereunder shall be subject to all provisions of the Contract Documents and the CONTRACTOR's sureties shall be bound with reference thereto as under the original Agreement. Copies of all amendments to Bonds or supplemental Bonds shall be submitted to the CITY for review prior to the performance of any work hereunder.

11.4 CONTRACTOR'S OVERHEAD AND PROFIT

- A. Extra work ordered on the basis of time and materials will be paid for at the actual necessary cost as determined by the ENGINEER, plus allowances for overhead and profit. No additional mark-ups and/or surcharges will be added to the cost. The allowance for overhead and profit will include full compensation for superintendence, taxes, field office expense, extended overhead, home office overhead, and all other items of expense or cost not included in the cost of labor, materials, or equipment provided for under Paragraph 11.3. The allowance for overhead and profit will be made in accordance with the following schedule:

Overhead and Profit Allowance

Labor 20 percent
Materials 15 percent
Equipment... 15 percent

To the sum of the costs and markups provided for in this Article, an additional 2 percent of the sum will be added as compensation for Bonds and insurance.

- B. It is understood that labor, materials, and equipment for extra work may be furnished by the CONTRACTOR or by the Subcontractor on behalf of the CONTRACTOR. When all or any part of the extra work is performed by a Subcontractor, the allowance specified herein will be applied to the labor, materials, and equipment costs of the Subcontractor, to which the CONTRACTOR may add 5 percent of the Subcontractor's total cost for the extra work. Regardless of the number of hierarchical tiers of Subcontractors, the 5 percent increase above the Subcontractor's total cost which includes the allowances for overhead and profit specified herein may be applied one time only.

11.5 EXCLUDED COSTS

- A. The term "cost of the work" shall not include any of the following:
 - 1. Payroll costs and other compensation of CONTRACTOR's officers, executives, proprietors, partners, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and

contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR whether at the Site or in CONTRACTOR's principal or a branch office for general administration of the WORK all of which are to be considered administrative costs covered by the CONTRACTOR's allowance for overhead and profit;

2. Non-direct labor costs, including superintendence, shall be considered part of the markup for overhead and profit, and no additional payment will be allowed for such;
3. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site;
4. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the WORK and charges against CONTRACTOR for delinquent payments;
5. Cost of premiums for all Bonds and for all insurance whether or no CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except as provided by Paragraph 11.4 above);
6. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied, and making good any damages to property; and
7. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in Paragraph 11.4.

11.6 CONTRACTOR'S EXTRA WORK REPORT

- A. In order to be paid for extra work, the CONTRACTOR must submit a daily extra work report on the form furnished by the ENGINEER. The form must be completely filled out based on the provisions of Paragraphs 11.3 through 11.5 and signed by the CONTRACTOR and ENGINEER at the end of each work day. Failure to complete the form and obtain appropriate signatures by the next working day after the extra work of the previous day was completed will result in CONTRACTOR's costs for extra work being disallowed.

ARTICLE 12 – CHANGE OF CONTRACT TIMES

12.1 GENERAL

- A. The Contract Times may only be changed by a Change Order. Any claim for an extension of the Contract Times shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 10 days) after the start of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 30 days after the start of such event (unless the ENGINEER allows an additional period of time for the submission of additional or more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR is entitled as a result of said event. All claims for adjustment in the Contract Times will be determined by the ENGINEER. No claim for an adjustment in the Contract Times will be valid if not submitted in accordance with the requirements of this Paragraph 12.1 A. An increase in Contract Times does not mean that the CONTRACTOR is due an increase in Contract Price. Only compensable time extensions will result in an increase in Contract Price.
- B. All time limits stated in the Contract Documents are of the essence of the Agreement.
- C. When CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost on the critical path of the WORK due to such delay, if a claim is made therefor as provided in Paragraph 12.1.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by CITY; acts or neglect of those performing other work as contemplated by Article 7; and fires, floods, epidemics, abnormal weather conditions, or acts of God. Delays attributable to and within the control of any Subcontractor or Supplier shall be deemed to be delays within the control of the CONTRACTOR.
- D. In no event will CITY be liable to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for any increase in the Contract Price or other damages arising out of or resulting from the following:
1. Delays caused by or within the control of CONTRACTOR; or
 2. Delays beyond the control of both CITY and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by those performing other work as contemplated by Article 7.

12.2 EXTENSIONS OF CONTRACT TIMES FOR DELAY DUE TO WEATHER

- A. The CONTRACTOR's construction schedule shall anticipate delay due to unusually severe weather. The number of days of anticipated delay is set forth in the Supplementary General Conditions.
- B. Contract Times may be extended by the ENGINEER because of delays in excess of the anticipated delay. The CONTRACTOR shall, within 10 days of the beginning of any such delay, notify the ENGINEER in writing and request an extension of Contract Times. The ENGINEER will ascertain the facts and the extent of the delay and extend the Contract Times when, in its judgment, the findings of the fact justify such an extension.

ARTICLE 13 – INSPECTIONS AND TESTS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

13.1 NOTICE OF DEFECTIVE WORK

- A. Prompt notice of Defective Work known to the ENGINEER will be given to the CONTRACTOR. All Defective Work, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13. Defective Work may be rejected even if approved by prior inspection.

13.2 ACCESS TO WORK

- A. ENGINEER and other representatives and personnel of CITY, independent testing laboratories, and governmental agencies with jurisdictional interests shall have access to the WORK at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

13.3 INSPECTIONS AND TESTS

- A. The CONTRACTOR shall give the ENGINEER not less than 24 hours notice of readiness of the WORK for all required inspections, tests, or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. The CITY shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. For inspection, tests, or approvals covered by Paragraphs 13.3C. and 13.3D. below;

2. That costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.3G. shall be paid as provided in said Paragraph 13.3G.; and
 3. As otherwise provided in the Contract Documents.
- C. If Laws and Regulations of any public body having jurisdiction require any WORK (or any part thereof) to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals; pay all costs in connection therewith; and furnish the ENGINEER the required certificates of inspection or approval.
- D. The CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for the ENGINEER's acceptance of materials or equipment to be incorporated in the WORK or acceptance of materials, mix designs, or equipment submitted for approval prior to the CONTRACTOR's purchase thereof for incorporation in the WORK. Such inspections, tests, or approvals shall be performed by organizations acceptable to the ENGINEER.
- E. The ENGINEER will make, or have made, such inspections and tests as the ENGINEER deems necessary to see that the WORK is being accomplished in accordance with the requirements of the Contract Documents. Unless otherwise specified in any Supplementary General Conditions, the cost of such inspection and testing will be borne by the CITY. In the event such inspections or tests reveal non-compliance with the requirements of the Contract Documents, the CONTRACTOR shall bear the cost of corrective measures deemed necessary by the ENGINEER, as well as the cost of subsequent reinspection and retesting. Neither observations by the ENGINEER nor inspections, tests, or approvals by others shall relieve the CONTRACTOR from the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.
- F. If any WORK (including the work of others) that is to be inspected, tested, or approved is covered without written concurrence of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the ENGINEER not less than 24 hours notice of the CONTRACTOR's intention to perform such test or to cover the same and the ENGINEER has not acted with reasonable promptness in response to such notice.
- G. If any WORK is covered contrary to the written request of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for the ENGINEER's observation and recovered at the CONTRACTOR's expense.

- H. If the ENGINEER considers it necessary or advisable that covered WORK be observed by the ENGINEER or inspected or tested by others, the CONTRACTOR, at the ENGINEER's request shall uncover, expose, or otherwise make available for observation, inspection, or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, material, and equipment. If it is found that such work is Defective Work, the CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, including but not limited to, fees and charges of engineers, architects, attorneys, and other professionals. However, if such work is not found to be Defective Work, the CONTRACTOR will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, the CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.
- I. No acceptance of equipment, materials, or work shall be construed to result from such inspections by the ENGINEER. Any inspections or tests or waivers thereof shall not relieve the CONTRACTOR of its responsibility for meeting the requirement of the Contract.

13.4 CITY MAY STOP THE WORK

- A. If Defective Work is identified, the ENGINEER may order the CONTRACTOR to stop performance of the WORK, or any portion thereof, until the cause for such order has been eliminated; however, this right of the ENGINEER to stop the WORK shall not give rise to any duty on the part of the ENGINEER to exercise this right for the benefit of the CONTRACTOR or any other party.

13.5 CORRECTION OR REMOVAL OF DEFECTIVE WORK

- A. If required by the ENGINEER, the CONTRACTOR shall promptly either correct all Defective Work, whether or not fabricated, installed, or completed, or, if the work has been rejected by the ENGINEER, remove it from the Site and replace it with non-defective WORK. The CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such correction or removal, including but not limited to fees and charges of engineers, architects, attorneys, and other professionals made necessary thereby.

13.6 ACCEPTANCE OF DEFECTIVE WORK

- A. If, instead of requiring correction or removal and replacement of Defective Work, the CITY prefers to accept the Defective Work, the CITY may do so. The CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to the CITY's evaluation of and determination to accept such Defective Work. If

any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK, and the CITY shall be entitled to an appropriate decrease in the Contract Price.

13.7 CITY MAY CORRECT DEFECTIVE WORK

- A. If the CONTRACTOR fails within a reasonable time after written notice from the ENGINEER to correct Defective Work, or to remove and replace Defective Work as required by the ENGINEER in accordance with Paragraph 13.5A., or if the CONTRACTOR fails to perform the WORK in accordance with the Contract Documents, or if the CONTRACTOR fails to comply with any other provision of the Contract Documents, the CITY may, after seven days written notice to the CONTRACTOR, correct and remedy any such deficiency.
- B. In exercising the rights and remedies under this paragraph, the CITY shall proceed with corrective and remedial action. In connection with such corrective and remedial action, the CITY may exclude the CONTRACTOR from all or part of the Site, take possession of all or part of the WORK, and suspend the CONTRACTOR's services related thereto and incorporate in the WORK all materials and equipment for which the CITY has paid the CONTRACTOR whether stored at the Site or elsewhere. The CONTRACTOR shall provide the CITY and its ENGINEER, access to the Site to enable CITY to exercise the rights and remedies under this paragraph.
- C. All direct, indirect, and consequential cost and damages incurred by the CITY in exercising the rights and remedies under this paragraph will be charged against the CONTRACTOR and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK; and the CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, the CITY may make a claim therefor as provided in Article 11. Such claim will include, but not be limited to, all costs of repair or replacement of work of others, destroyed or damaged by correction, removal, or replacement of CONTRACTOR's Defective Work and all direct, indirect, and consequential damages associated therewith.
- D. The CONTRACTOR shall not be allowed an extension of Contract Times (or Milestones) because of any delay in the performance of the WORK attributable to the exercise by CITY of CITY's rights and remedies under this paragraph.

13.8 CORRECTION PERIOD

- A. The correction period for Defective Work shall be the longer of:
 - 1. One year after the date of final acceptance;

2. Such time as may be prescribed by Laws and Regulations;
 3. Such time as specified by the terms of any applicable special guarantee required by the Contract Documents; or
 4. Such time as specified by any specific provision of the Contract Documents.
- B. If, during the correction period as defined in Paragraph 13.8A above, any work is found to be Defective Work, the CITY shall have the same remedies as set forth in Paragraphs 13.5, 13.6, and 3.7 above.
- C. Where Defective Work (and damage to other work resulting therefrom) has been corrected, removed, or replaced under this paragraph, the correction period hereunder with respect to such work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 SCHEDULE OF VALUES (LUMP SUM PRICE BREAKDOWN)

- A. The schedule of values or lump sum price breakdown established as provided in the General Requirements shall serve as the basis for progress payments and shall be incorporated into a form of “Application for Payment acceptable to the ENGINEER.

14.2 UNIT PRICE BID SCHEDULE

- A. Progress payments on account of unit price work will be based on the number of units completed.

14.3 APPLICATION FOR PROGRESS PAYMENT

- A. Unless otherwise prescribed by law, on the 25th of each month, the CONTRACTOR shall submit to the ENGINEER for review, the Application for Payment filled out and signed by the CONTRACTOR covering the WORK completed as of the Application for Payment and accompanied by such supporting documentation as is required by the Contract Documents.
- B. The Application for Payment shall identify, as a subtotal, the amount of the CONTRACTOR total earnings to date; plus the value of materials stored at the Site which have not yet been incorporated in the WORK; and less a deductive adjustment for materials installed which were not previously incorporated in the WORK, but for which payment was allowed under the provisions for payment for materials stored at the Site, but not yet incorporated in the WORK.

- C. The net payment due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the amount of retainage specified in the Supplementary General Conditions and the total amount of all previous payments made to the CONTRACTOR.
- D. The value of materials stored at the Site shall be an amount equal to the specified percent of the value of such materials as set forth in any Supplementary General Conditions. Said amount shall be based upon the value of all acceptable materials and equipment not incorporated in the WORK but delivered and suitably stored at the Site or at another location agreed to in writing; provided, each such individual item has a value of more than \$5,000 and will become a permanent part of the WORK. The Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that the CONTRACTOR has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the CITY's interest therein, all of which will be satisfactory to the CITY.
- E. A ten percent (10%) retention of payment amount shall be held by the CITY from the amount of each Application for Payment.
- F. **OPTIONAL:** Partial payments for mobilization/demobilization costs shall be as follows:
 - 1. Thirty-five percent (35%) of the amount bid for mobilization/demobilization or 1.75 percent of the original Contract Price, whichever is less, shall be paid in each of the first two progress payments.
 - 2. The balance of the amount bid for mobilization/demobilization shall be paid upon completion of all WORK on the project.

14.4 CONTRACTOR'S WARRANTY OF TITLE

- A. The CONTRACTOR warrants and guarantees that title to all WORK, materials, and equipment covered by an Application for Payment, whether incorporated in the WORK or not, will pass to the CITY no later than the time of payment, free and clear of all Liens.

14.5 REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT

- A. The ENGINEER will, within 7 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the application to the CITY, or return the application to the CONTRACTOR indicating in writing the ENGINEER'S REASONS FOR REFUSING TO RECOMMEND PAYMENT. In the latter case, the CONTRACTOR may make

the necessary corrections and resubmit the application. If the ENGINEER still disagrees with a portion of the application, it will submit the application recommending the undisputed portion of the application to the CITY for payment and provide reasons for recommending non-payment of the disputed amount. Thirty days after presentation of the Application for Payment with the ENGINEER'S recommendation, the amount recommended will (subject to the provisions of Paragraph 14.5B.) become due and when due will be paid by the CITY to the CONTRACTOR.

- B. The ENGINEER, in its discretion, may refuse to recommend the whole or any part of any payment. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER's opinion to protect CITY from loss because:
1. The work is Defective Work or the completed WORK has been damaged requiring correction or replacement.
 2. The Contract Price has been reduced by written amendment or Change Order.
 3. The CITY has been required to correct Defective Work or complete WORK in accordance with Paragraph 13.7.
 4. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.1 through 15.4 inclusive.
 5. Third party claims filed or reasonable evidence indicating probable filing of such claims; or
 6. Failure of the Contractor to make payments properly to subcontractors or for labor, materials, or equipment; or
 7. Reasonable evidence that the work cannot be completed for the unpaid balance of the contract sum; or
 8. Failure of the Contractor to submit an acceptable construction schedule or failure to update the schedule; or
 9. Damage to the City or another contractor; or
 10. Reasonable evidence that the work will not be completed within the time provided for in the Contract; or

11. Contractor's failure or inability to obtain or maintain insurance coverage and bonds as required by the Contract throughout the course of the job; or
 12. Persistent failure to carry out the work in accordance with the Contract; or
 13. Failure to deliver copies of certified payrolls, as specified in Section 17.11, General Conditions.
 14. In addition, the City may deduct from any such payments due the Contractor any amounts the City may be currently or in the future authorized to retain pursuant to federal, state, or local laws or regulations, any amounts due the City from the Contractor, and any other amounts which the City is otherwise authorized to retain as specified in Special Provisions.
- C. The CITY may refuse to make payment of the full amount recommended by the ENGINEER because:
1. Claims have been made against CITY on account of CONTRACTOR's performance or furnishing of the WORK.
 2. Liens have been filed in connection with the WORK, except where CONTRACTOR has delivered a specific Bond satisfactory to CITY to secure the satisfaction and discharge of such Liens.
 3. There are other items entitling CITY to set-off against the amount recommended, or
 4. CITY has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.5B. through 14.5C and 15.1 through 15.4 inclusive.

The CITY must give the CONTRACTOR immediate written notice stating the reasons for such action and promptly pay the CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by CITY and CONTRACTOR, when CONTRACTOR corrects to CITY's satisfaction the reasons for such action.

14.6 COMPLETION

- A. When the CONTRACTOR considers the WORK ready for its intended use, the CONTRACTOR shall notify the ENGINEER in writing that the WORK is complete. The CONTRACTOR shall attach to this request a list of all work items that remain to be completed and a request that the ENGINEER prepare a Notice of Completion. Within a reasonable time thereafter, the CONTRACTOR, and the ENGINEER shall make an inspection of the WORK to determine the status of completion. If the ENGINEER considers the WORK complete, the ENGINEER

will prepare and execute and deliver for City Council approval and recordation the Notice of Completion signed by the ENGINEER and CONTRACTOR, which shall fix the date of completion.

14.7 PARTIAL UTILIZATION

- A. The CITY shall have the right to utilize or place into service any item of equipment or other usable portion of the WORK prior to completion of the WORK. Whenever the CITY plans to exercise said right, the CONTRACTOR will be notified in writing by the ENGINEER, identifying the specific portion or portions of the WORK to be so utilized or otherwise placed into service.
- B. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of Partial Utilization, the CITY will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.
- C. The CONTRACTOR shall retain full responsibility for satisfactory completion of the WORK, regardless of whether a portion thereof has been partially utilized by the CITY prior to completion of the WORK.

14.8 FINAL APPLICATION FOR PAYMENT

- A. After the CONTRACTOR has completed all of the remaining work items referred to in Paragraph 14.6 and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in the General Requirements), and other documents, all as required by the Contract Documents, and after the ENGINEER has indicated that the WORK is acceptable, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the CITY) of all Liens arising out of or filed in connection with the WORK.

14.9 FINAL PAYMENT AND ACCEPTANCE

- A. If, on the basis of the ENGINEER's observation of the WORK during construction and final inspection, and the ENGINEER's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ENGINEER is satisfied that the WORK has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will, within 14 days after receipt

of the final Application for Payment, indicate in writing the ENGINEER's recommendation of payment and present the application to the CITY for payment.

- B. After acceptance of the WORK by the City Council, the CITY will make final payment to the CONTRACTOR of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including the following items:
1. Liquidated damages, as applicable;
 2. Amounts withheld by CITY under Paragraph 14.5B. and C. which have not been released; and
 3. In accordance with Section 17.6, one-and-one-half times the value of outstanding items of correction work or punch list items yet uncompleted or uncorrected, as applicable. All such work shall be completed or corrected to the satisfaction of the ENGINEER as required by the Contract Documents, otherwise the CONTRACTOR does hereby waive any and all claims to all monies withheld by the CITY to cover the value of all such uncompleted or uncorrected items.
- C. Prior to final payment by the CITY, the CONTRACTOR must provide the CITY a fully-executed Conditional Waiver and Release Upon Final Payment in accordance with California Civil Code Section 3262.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.1 SUSPENSION OF WORK BY CITY

- A. The CITY may, at any time and without cause, suspend the WORK or any portion thereof for a period of not more than 90 days by notice in writing to the CONTRACTOR. The CONTRACTOR shall resume the WORK on receipt of a notice of resumption of work. The CONTRACTOR will be allowed an increase in the Contract Price or an extension of the Contract Time, or both directly attributable to any suspension if the CONTRACTOR makes an approval claim therefor as provided in Articles 11 and 12.

15.2 TERMINATION OF AGREEMENT BY ENGINEER FOR DEFAULT

- A. In the event of default by the CONTRACTOR, the ENGINEER may give seven days written notice to the CONTRACTOR and the CONTRACTOR's surety of CITY's intent to terminate the Agreement and provide the CONTRACTOR an opportunity to remedy the conditions constituting the default within a specified period of time. It will be considered a default by the CONTRACTOR whenever CONTRACTOR shall:
1. Declare bankruptcy, become insolvent, or assign its assets for the benefit of its creditors;
 2. Disregard or violate the Laws or Regulations of any public body having jurisdiction;
 3. Fail to provide materials or workmanship meeting the requirements of the Contract Documents;
 4. Disregard or violate provisions of the Contract Documents or ENGINEER's instructions;
 5. Fail to prosecute the WORK according to the approved progress schedule;
 6. Fail to provide a qualified superintendent, competent workmen, or materials or equipment meeting the requirements of the Contract Documents;
 7. Disregard the authority of the ENGINEER; or
 8. Assign or subcontract any part of the work without the ENGINEER's consent.
- B. If the CONTRACTOR fails to remedy the conditions constituting default within the time allowed, the ENGINEER may then issue the notice of termination.

- C. In the event the Agreement is terminated in accordance with Paragraph 15.2A., herein, the CITY may take possession of the WORK and may complete the WORK by whatever method or means the CITY may select. The cost of completing the WORK will be deducted from the balance which would have been due the CONTRACTOR had the Agreement not been terminated and the WORK completed in accordance with the Contract Documents. If such cost exceeds the balance which would have been due, the CONTRACTOR shall pay the excess amount to the CITY. If such cost is less than the balance which would have been due, the CONTRACTOR shall not have claim to the difference.

15.3 TERMINATION OF AGREEMENT BY CITY FOR CONVENIENCE

- A. Upon seven days' written notice to the CONTRACTOR, the CITY may, without cause and without prejudice to any other right or remedy of the CITY, elect to terminate the Agreement. In such case, the CONTRACTOR shall be paid (without duplication of any items):
 - 1. For completed and acceptable WORK executed in accordance with the Contract Documents, prior to the effective date of termination, including fair and reasonable sums for overhead and profit of such WORK;
 - 2. For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted WORK, plus fair and reasonable sums or overhead and profit on such expenses;
 - 3. For all reasonable claims, costs, losses, and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. For reasonable expenses directly attributable to termination.

CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.4 TERMINATION OF AGREEMENT BY CONTRACTOR

- A. The CONTRACTOR may terminate the Agreement upon 14 days written notice to the ENGINEER whenever:
 - 1. The WORK has been suspended under the provisions of Paragraph 15.1, herein, for more than 90 consecutive days through no fault or negligence of the CONTRACTOR, and notice to resume work or to terminate the

Agreement has not been received from the ENGINEER within this time period; or

2. The CITY should fail to pay the CONTRACTOR any monies due him in accordance with the terms of the Contract Documents and within 60 days after presentation to the ENGINEER by the CONTRACTOR of a request therefor, unless within said 14-day period the CITY shall have remedied the condition upon which the payment delay was based.
- B. In the event of such termination, the CONTRACTOR shall have no claims against the CITY except for those claims specifically enumerated in Paragraph 15.3, herein, and as determined in accordance with the requirements of said paragraph.

ARTICLE 16 – GENERAL TERMS

16.1 GIVING NOTICE

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

16.2 TITLE TO MATERIALS FOUND ON THE WORK

- A. The CITY reserves the right to retain title to all soils, stone, sand, gravel, and other materials developed and obtained from excavations and other operations connected with the WORK. Unless otherwise specified in the Contract Documents, neither the CONTRACTOR nor any Subcontractor shall have any right, title, or interest in or to any such materials. The CONTRACTOR will be permitted to use in the WORK, without charge, any such materials which meet the requirements of the Contract Documents.

16.3 RIGHT TO AUDIT

- A. If the CONTRACTOR submits a claim to the ENGINEER for additional compensation, the CITY shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the CONTRACTOR's books to the extent they are relevant. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which the claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR's plant or such parts thereof, as may be or have been engaged in the performance of the WORK. The CONTRACTOR further agrees that the right to audit encompasses

all subcontracts and is binding upon Subcontractors. The rights to examine and inspect herein provided for shall be exercisable through such representatives as the CITY deems desirable during the CONTRACTOR's normal business hours at the office of the CONTRACTOR. The CONTRACTOR shall make available to the ENGINEER for auditing, all relevant accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the ENGINEER.

16.4 SURVIVAL OF OBLIGATIONS

- A. All representations, indemnifications, warranties, and guaranties made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the WORK or termination or completion of the Agreement.

16.5 CONTROLLING LAW

- A. This Agreement is to be governed by the law of the state in which the Project is located.

16.6 SEVERABILITY

- A. If any term or provision of this Agreement is declared invalid or unenforceable by any court of lawful jurisdiction, the remaining terms and provisions of the Agreement shall not be affected thereby and shall remain in full force and effect.

16.7 WAIVER

- A. The waiver by the CITY of any breach or violation of any term, covenant or condition of this Agreement or of any provision, ordinance, or law shall not be deemed to be a waiver of any other term, covenant, condition, ordinance, or law or of any subsequent breach or violation of the same or of any other term, covenant, condition, ordinance, or law. The subsequent payment of any monies or fee by the CITY which may become due hereunder shall not be deemed to be a waiver of any preceding breach or violation by CONTRACTOR or any term, covenant, condition of this Agreement or of any applicable law or ordinance.

ARTICLE 17 – CALIFORNIA STATE REQUIREMENTS

17.1 STATE WAGE DETERMINATIONS

- A. As required by Section 1770 and following, of the California Labor Code, the CONTRACTOR shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages available file at the office of the City Clerk, which copies shall be made available to any interested party on request. The CONTRACTOR shall post a copy of such determination at each job site.
- B. In accordance with Section 1775 of the California Labor Code, the CONTRACTOR shall, as a penalty to the CITY, forfeit not more than **\$200.00** for each calendar day or portion thereof, for each worker paid less than the prevailing rates as determined by the Director for the work or craft in which the worker is employed for any public work done under the contract by him or her or by any subcontractor under him or her.

17.2 WORKERS' COMPENSATION

- A. In accordance with the provisions of Section 3700 of the California Labor Code, the CONTRACTOR shall secure the payment of compensation to its employees.
- B. Prior to beginning work under the Contract, the CONTRACTOR shall sign and file with the ENGINEER the following certification:

“I am aware of the provisions of Section 3700 of the Labor Code, which require every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the WORK of this Contract.”
- C. Notwithstanding the foregoing provisions, before the Contract is executed on behalf of the CITY, a bidder to whom a contract has been awarded shall furnish satisfactory evidence that it has secured in the manner required and provided by law the payment of workers’ compensation.

17.3 APPRENTICES ON PUBLIC WORKS

- A. The CONTRACTOR shall comply with all applicable provisions of Section 1777.5 of the California Labor Code relating to employment of apprentices on public works.

17.4 WORKING HOURS

- A. The CONTRACTOR shall comply with all applicable provisions of Section 1810 to 1815, inclusive, of the California Labor Code relating to working hours. The CONTRACTOR shall, as a penalty to the CITY, forfeit \$25.00 for each worker employed in the execution of the Contract by the CONTRACTOR or by any subcontractor for each calendar day during which such worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week, unless such worker receives compensation for all hours worked in excess of 8 hours at not less than 1-1/2 times the basic rate of pay.

17.5 CONTRACTOR NOT RESPONSIBLE FOR DAMAGE RESULTING FROM CERTAIN ACTS OF GOD

- A. As provided in Section 7105 of the California Public Contract Code, the CONTRACTOR shall not be responsible for the cost of repairing or restoring damage to the WORK which damage is determined to have been proximately caused by an act of God, in excess of 5 percent of the contracted amount, provided, that the WORK damaged was built in accordance with accepted and applicable building standards and the plans and specifications of the CITY. The CONTRACTOR shall obtain insurance to indemnify the CITY for any damage to the WORK caused by an act of God if the insurance premium is a separate bid item in the bidding schedule for the WORK. For purposes of this Section, the term "acts of God" shall include only the following occurrences or conditions and effects: earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves.

17.6 NOTICE OF COMPLETION

- A. In accordance with the Sections 3086 and 3093 of the California Civil Code, within 10 days after date of acceptance of the WORK BY THE City Council the ENGINEER will file, in the County Recorder's office, a Notice of Completion of the WORK.

17.7 UNPAID CLAIMS

- A. If, at any time prior to the expiration of the period for service of a stop notice, there is served upon the CITY a stop notice as provided in Sections 3179 and 3210 of the California Civil Code, the CITY shall, until the discharge thereof, withhold from the monies under its control so much of said monies due or to become due to the CONTRACTOR under this Contract as shall be sufficient to answer the claim stated in such stop notice and to provide for the reasonable cost of any litigation thereunder; provided, that if the ENGINEER shall, in its discretion, permit CONTRACTOR to file with the ENGINEER the bond referred to in Section 3196 of the Civil Code of the State of California, said monies shall not thereafter be withheld on account of such stop notice.

17.8 RETAINAGE FROM MONTHLY PAYMENTS

- A. Pursuant to Section 22300 of the California Public Contract Code, the CONTRACTOR may substitute securities for any money withheld by the CITY to insure performance under the Contract. At the request and expense of the CONTRACTOR, securities equivalent to the amount withheld shall be deposited with the CITY or with a state or federally chartered bank in California as to the escrow agent, who shall return such securities to the CONTRACTOR upon satisfactory completion of the Contract.
- B. Alternatively, the CONTRACTOR may request and the CITY shall make payment of retentions earned directly to the escrow agent at the expense of the CONTRACTOR. At the expense of the CONTRACTOR, the CONTRACTOR may direct the investment of the payments into securities and the CONTRACTOR shall receive the interest earned on the investments upon the same terms provided in Section 22300 of the Public Contract Code securities deposited by the CONTRACTOR. The CONTRACTOR shall be responsible for paying all fees for the expenses incurred by the escrow agent in administering the escrow account and all expenses of the CITY. These expenses and payment terms shall be determined by the CITY's Finance Director or his/her designee and the escrow agent. Upon satisfactory completion of the Contract, the CONTRACTOR shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the CITY, pursuant to the terms of Section 22300 of the Public Contract Code. The CONTRACTOR shall pay to each subcontractor, not later than 20 days of receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the CONTRACTOR.
- C. Securities eligible for investment under Section 22300 shall be limited to those listed in Section 16430 of the Government Code and to bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the CONTRACTOR and the CITY.

17.9 PUBLIC WORKS CONTRACTS; ASSIGNMENT TO AWARDING BODY

- A. In accordance with Section 7103.5 of the California Public Contract Code, the CONTRACTOR and Subcontractors shall conform to the following requirements. In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the CONTRACTOR or subcontractor offers and agrees to assign to the CITY 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. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising

from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the CONTRACTOR, without further acknowledgment by the parties.

17.10 PAYROLL RECORDS; RETENTION; INSPECTION; NONCOMPLIANCE PENALTIES; RULES AND REGULATIONS

- A. In accordance with Section 1776 of the California Labor Code 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 by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:
1. The information contained in the payroll record is true and correct.
 2. The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.
- B. The payroll records shall be certified and shall be available for inspection at all reasonable hours at the principal office of the CONTRACTOR on the following basis:
1. A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request as well as submitted electronically online to the Department of Industrial Relations Labor Commissioner: <https://apps.dir.ca.gov/ecpr/DAS/AltLogin>.
 2. A certified copy of all payroll records shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
 3. A certified copy of all payroll records shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the

CONTRACTOR, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the CONTRACTOR.

- C. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.
- D. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the CONTRACTOR awarded the contract or performing the contract shall not be marked or obliterated.
- E. The CONTRACTOR shall inform the ENGINEER of the location of the records including the street address, city and county, and shall, within 5 working days, provide a notice of change of location and address.
- F. The CONTRACTOR shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects the CONTRACTOR must comply with this Section. In the event that the CONTRACTOR fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

17.11 CULTURAL RESOURCES

- A. The CONTRACTOR's attention is directed to the provisions of the Clean Water Grant Program Bulletin 76A which augments the National Historic Preservation Act of 1966 (16 U.S.C. 470) as specified under Section 01560 - Temporary Environmental Controls, of the General Requirements.

17.12 PROTECTION OF WORKERS IN TRENCH EXCAVATIONS

- A. As required by Section 6705 of the California Labor Code and in addition thereto, whenever work under the Contract involves the excavation of any trench or trenches 5 feet or more in depth, the CONTRACTOR shall submit for acceptance by the ENGINEER, to whom authority to accept has been delegated, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping, or

other provisions to be made for worker protection from the hazard of caving ground during the excavation, of such trench or trenches. If such plan varies from the shoring system standards established by the Construction Safety Orders of the Division of Occupational Safety and Health, the plan shall be prepared by a registered civil or structural engineer employed by the CONTRACTOR, and all costs therefore shall be included in the price named in the Contract for completion of the WORK as set forth in the Contract Documents. Nothing in this Section shall be deemed to allow the use of a shoring, sloping, or other protective system less effective than that required by the Construction Safety Orders. Nothing in this Section shall be construed to impose tort liability on the CITY or any of its officers, agents, representatives, or employees.

- B. Excavation shall not start until the CONTRACTOR has obtained a permit from the California Division of Industrial Safety and has posted it at the site.

17.13 CONCRETE FORMS, FALSEWORK, AND SHORING

- A. The CONTRACTOR shall comply fully with the requirements of Section 1717 of the Construction Safety Orders, State of California, Department of Industrial Relations, regarding the design of concrete forms, falsework and shoring, and the inspection of same prior to placement of concrete. Where the said Section 1717 requires the services of a civil engineer registered in the State of California to approve design calculations and working drawings of the falsework or shoring system, or to inspect such system prior to placement of concrete, the CONTRACTOR shall employ a registered civil engineer for these purposes, and all costs therefore shall be included in the price named in the Contract for completion of the WORK as set forth in the Contract Documents.

17.14 REMOVAL, RELOCATION, OR PROTECTION OF EXISTING UTILITIES

- A. In accordance with the provisions with the provisions of Section 4215 of the California Government Code, the CITY shall assume the responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the site of any construction project that is a subject of the Contract, if such utilities are not identified by the CITY in the plans and specifications made a part of the invitation for bids. The CITY will compensate CONTRACTOR for the costs of locating, repairing damage not due to the failure of the CONTRACTOR to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work.
- B. The CONTRACTOR shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the public agency or the owner of the utility to provide for removal or relocation of such utility facilities.

- C. Nothing herein shall be deemed to require the public agency to indicate the presence of existing service laterals or appurtenances when the presence of such utilities on the site of the construction project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of construction; provided however, nothing herein shall relieve the public agency from identifying main or trunklines in the plans and specifications.
- D. If the CONTRACTOR while performing the Contract discovers utility facilities not identified by the public agency in the Contract Documents it shall immediately notify the public agency and utility in writing.
- E. The public utility, where they are the owner, shall have the sole discretion to perform such repairs or relocation work or permit the CONTRACTOR to do such repairs or relocation work at a reasonable price.

17.15 CONTRACTOR LICENSE REQUIREMENTS

- A. In accordance with Section 7028.15 of the California Business and Professions Code:
- B. It is a misdemeanor for any person to submit a bid to a public agency in order to engage in the business or act in the capacity of a contractor within this state without having a license therefor, except in any of the following cases:
 - 1. The person is particularly exempted from this chapter.
 - 2. The bid is submitted on a state project governed by Section 10164 of the Public Contract Code or any local agency project governed by Section 20103.5 of the Public Contract Code.
- C. If a person has previously been convicted of the offense described in this section, the court shall impose a fine of 20 percent of the price of the contract under which the unlicensed person performed contract work, or four thousand five hundred dollars (\$4,500), whichever is greater, or imprisonment in the county jail for not less than 10 days nor more than six months, or both.
- D. In the event the person performing the contracting work has agreed to furnish materials and labor on an hourly basis, “the price of the contract” for the purpose of this subdivision means the aggregate sum of the cost of materials and labor furnished and the cost of completing the work to be performed.
- E. This section shall not apply to a joint venture license, as required by Section 7029.1 of the California Business and Professions Code. However, at the time of making a bid as a joint venture, each person submitting the bid shall be subject to this section with respect to his or her individual licensure.

- F. This section shall not affect the right or ability of a licensed architect, land surveyor, or registered professional engineer to form joint ventures with licensed contractors to render services within the scope of their respective practices.
- G. Unless one of the foregoing exceptions applies, a bid submitted to a public agency by a contractor who is not licensed in accordance with this chapter shall be considered nonresponsive and shall be rejected by the public agency. Unless one of the foregoing exceptions applies, a local public agency shall, before awarding a contract or issuing a purchase order, verify that the contractor was properly licensed when the contractor submitted the bid. Notwithstanding any other provision of law, unless one of the foregoing exceptions applies, the registrar may issue a citation to any public officer or employee of a public entity who knowingly awards a contract or issues a purchase order to a contractor who is not licensed pursuant to this chapter. The amount of civil penalties, appeal, and finality of such citations shall be subject to Sections 7028.7 and 7028.13 inclusive of the California Business and Professions Code. Any contract awarded to, or any purchase order issued to, a contractor who is not licensed pursuant to this chapter is void.
- H. Any compliance or noncompliance with subdivision (G) of this paragraph shall not invalidate any contract or bid awarded by a public agency during which time that subdivision was in effect.
- I. A public employee or officer shall not be subject to a citation pursuant to this section if the public employee, officer, or employing agency made an inquiry to the board for the purposes of verifying the license status of any person or contractor and the board failed to respond to the inquiry within three business days. For the purposes of this section, a telephone response by the board shall be deemed sufficient.

17.16 DIGGING TRENCHES OR EXCAVATIONS; NOTICE ON DISCOVERY OF HAZARDOUS WASTE OR OTHER UNUSUAL CONDITIONS; INVESTIGATIONS; CHANGE ORDERS; EFFECT ON CONTRACT

- A. If this Contract involves digging trenches or other excavations that extend deeper than four feet below the surface, the following shall apply:
 - 1. The CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the ENGINEER in writing, of any:
 - a. Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

- b. Subsurface or latent physical conditions at the site differing from those indicated.
- c. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.
- d. The ENGINEER shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR'S cost of, or the time required for, performance of any part of the work shall issue a change order the procedures described in the Contract.
- e. In the event that a dispute arises between the ENGINEER and the CONTRACTOR whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the CONTRACTOR'S cost of, or time required for, performance of any part of the work, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The CONTRACTOR shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

17.17 RETENTION PROCEEDS; WITHHOLDING; DISBURSEMENT

- A. In accordance with Section 7107 of the Public Contract Code with respects to all contracts entered into on or after January 1, 1993 relating to the construction of any public work of improvement the following shall apply:
 - 1. The retention proceeds withheld from any payment by the CITY from the original CONTRACTOR, or by the original CONTRACTOR from any subcontractor, shall be subject to this paragraph 17.18.
 - 2. Within 60 days after the date of completion of the WORK, including any punch-list WORK, the retention withheld by the CITY shall be released. In the event of a dispute between the ENGINEER and the original CONTRACTOR, the CITY may withhold from the final payment an amount not to exceed 150 percent of the disputed amount. For the purposes of this paragraph, "completion" means any of the following:
 - a. The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or

commissioning, by the CITY, accompanied by cessation of labor on the work of improvement.

- b. The acceptance by the City Council of the work of improvement.
 - c. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 100 days or more, due to factors beyond the control of the CONTRACTOR.
 - d. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 30 days or more, if the ENGINEER files for record a notice of cessation or a notice of completion.
3. Subject to subparagraph 17.18 A.4, within 10 days from the time that all or any portion of the retention proceeds are received by the original CONTRACTOR, the original CONTRACTOR shall pay each of its subcontractors from whom retention has been withheld, each subcontractor's share of the retention received. However, if a retention payment received by the original CONTRACTOR is specifically designated for a particular subcontractor, payment of the retention shall be made to the designated subcontractor, if the payment is consistent with the terms of the subcontract.
 4. The original CONTRACTOR may withhold from a subcontractor its portion of the retention proceeds if a bona fide dispute exists between the subcontractor and the original CONTRACTOR. The amount withheld from the retention payment shall not exceed 150 percent of the estimated value of the disputed amount.
 5. In the event that retention payments are not made within the time periods required by this paragraph 17.18, the CITY or original CONTRACTOR shall be subject to a charge of 2 percent per month on the improperly withheld amount, in lieu of any interest otherwise due. Additionally, in any action for the collection of funds wrongfully withheld, the prevailing party shall be entitled to attorney's fees and costs.
 6. Any attempted waiver of the provisions of this section shall be void as against the public policy of this state.

17.18 TIMELY PROGRESS PAYMENTS; INTEREST; PAYMENT REQUESTS

- A. If the CITY fails to make any progress payment within 30 days after receipt of an undisputed and properly submitted payment request from the CONTRACTOR, the CITY shall pay interest to the CONTRACTOR equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.
- B. Upon receipt of a payment request, the ENGINEER shall act in accordance with both of the following:
 - 1. Each payment request shall be reviewed by the ENGINEER as soon as practicable after receipt for the purpose of determining that the payment request is a proper payment request.
 - 2. Any payment request determined not to be a proper payment request suitable for payment shall be returned to the CONTRACTOR as soon as practicable, but not later than seven days, after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.
- C. The number of days available to the CITY to make a payment without incurring interest pursuant to this paragraph shall be reduced by the number of days by which the CITY exceeds the seven-day requirement set forth above.
- D. For purposes of this paragraph:
 - 1. A “progress payment” includes all payments due the CONTRACTOR, except that portion of the final payment designated by the contract as retention earnings.
 - 2. A payment request shall be considered properly executed if funds are available for payment of the payment request, and payments is not delayed due to an audit inquiry by the financial officer of the CITY.

17.19 PREFERENCE FOR MATERIAL

- A. In accordance with Section 3400 of the California Public Contract Code, the CONTRACTOR will be provided a period prior to award of the contract for submission of data substantiating a request for a substitution of “as equal” item.

17.20 RESOLUTION OF CONSTRUCTION CLAIMS

- A. In accordance with Section 20104 et Seq. of the California Public Contract Code. This paragraph applies to all claims of \$375,000 or less which arise between the CONTRACTOR and the CITY under this Contract for:
1. A time extension;
 2. Payment of money or damages arising from work done by or on behalf of, the CONTRACTOR pursuant to this CONTRACT and payment of which is not otherwise expressly provided for or the CONTRACTOR is not otherwise entitled to; or
 3. An amount the payment of which is disputed by the ENGINEER.
- B. For any claim set out in Paragraphs A.1, 2, or 3 above, the following requirements apply:
1. The claim shall be in writing and include the documents necessary to substantiate the claim and be accompanied by the following certification:

“CONTRACT PROVISION REQUIRING PERSONAL CERTIFICATION OF ALL CLAIMS:

I, _____, BEING THE _____ (MUST BE AN OFFICER) OF _____ (GENERAL CONTRACTOR), DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA, AND DO PERSONALLY CERTIFY AND ATTEST THAT: I HAVE THOROUGHLY REVIEWED THE ATTACHED CLAIM FOR ADDITIONAL COMPENSATION AND/OR EXTENSION OF TIME, AND KNOW ITS CONTENTS, AND SAID CLAIM IS MADE IN GOOD FAITH; THE SUPPORTING DATA IS TRUTHFUL AND ACCURATE; THAT THE AMOUNT REQUESTED ACCURATELY REFLECTS THE CONTRACT ADJUSTMENT FOR WHICH THE CONTRACTOR BELIEVES THE CITY IS LIABLE; AND, FURTHER THAT I AM FAMILIAR WITH CALIFORNIA PENAL CODE SECTION 12650, ET SEQ. PERTAINING TO FALSE CLAIMS, AND FURTHER KNOW AND UNDERSTAND THAT SUBMISSION OR CERTIFICATION OF A FALSE CLAIM MAY LEAD TO FINES, IMPRISONMENT AND/OR OTHER SEVERE LEGAL CONSEQUENCES.”

Claims must be filed on or before the date of final payment. Nothing herein is intended to extend the time limit or supersede notice requirements otherwise provided by Contract for the filing of claims.

The claim must include an actual cost documentation, including hours of work performed, equipment operation costs, and labor and overhead costs, which should be established at a standard percentage. Any overhead costs listed when paid, shall provide full and complete payment for any and all overhead, including jobsite overhead, home office overhead, as well as additional costs arising from disruption, resequencing or acceleration. A notice of POTENTIAL CLAIM shall be submitted in advance of the performance of any work, regardless of type, in which the CONTRACTOR may claim an additional cost. CONTRACTOR shall provide prompt notification of any disagreement in quantities of work performed along with a detailed accounting by means of a schedule update demonstrating any delays incurred.

2. For claims of less than fifty thousand dollars (\$50,000), the ENGINEER shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the CITY may have against the CONTRACTOR.

If additional information is thereafter required, it shall be requested and provided upon mutual agreement of the ENGINEER and the CONTRACTOR.

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

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

If additional information is thereafter required, it shall be requested and provided upon mutual agreement of the ENGINEER and the CONTRACTOR.

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

4. If the CONTRACTOR disputes the ENGINEER's written response, or the ENGINEER fails to respond within the time prescribed, the CONTRACTOR may notify the ENGINEER, in writing, either within 15 days of receipt of the ENGINEER's response or within 15 days of the ENGINEER's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the ENGINEER shall schedule a meet and confer conference within 30 days for settlement of the dispute.
5. Following the meet and confer conference, if the claim or any portion remains in dispute, the CONTRACTOR may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time CONTRACTOR submits its written claim pursuant to subdivision (a) until the time the claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

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

1. Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.
2. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of Article 1.5 of Chapter 1 of Part 3 of Division 2 of the California Public Contract Code shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

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

3. The CITY shall not fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in this Contract.
4. In any suit filed under Section 20104.4 of the California Public Contract Code, the CITY shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

END OF GENERAL CONDITIONS

file name:

SECTION III
SPECIAL PROVISIONS

SECTION III.

SPECIAL PROVISIONS

- 3-1. DESCRIPTION OF WORK – The Hardin Tank Rehabilitation Project includes removing all interior and exterior tank coatings, preparing all steel surfaces, and recoating per the specifications. Tank improvements will include the addition of steel handrailing on the roof, new roof vents, replacement of the level indicator, replacement of the interior ladder, replacement of roof rafter ties and minor piping improvements. Control and isolation valves will be replaced in the valve vault next to the tank. Electrical work will include a new electronics cabinet, intrusion switches and site lighting. Additional work may include bid alternate(s) such as seal welding roof plates or seal welding rafters.
- 3-2. ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS – If the CONTRACTOR discovers any errors, omissions, discrepancies, or conflicts in the Contract, he/she shall immediately inform the ENGINEER in writing. The ENGINEER will promptly resolve such matters by issuing addenda or change orders. Failure to act or delay on the part of the ENGINEER shall not constitute a waiver of any right afforded the CITY or the ENGINEER by the Contract or constitute an implied approval. Any work affected by such discoveries that is performed by the CONTRACTOR prior to authorization by the CITY shall be at the CONTRACTOR'S risk.

Unless otherwise noted below, conflicts or inconsistencies between parts of the Contract will be resolved by the ENGINEER with a change order or an addendum, if required. Addenda and change orders bearing the most recent date shall prevail over addenda or change orders bearing earlier dates. Any reference to addenda-changed specifications or drawings shall be considered to have been changed accordingly.

In resolving conflicts, errors, or discrepancies, the order of precedence shall be as follows:

- 1) Change Orders/Addenda (most recent in time takes precedence)
- 2) Agreement and Bond Forms
- 3) Special Provisions
- 4) Technical Specifications
- 5) Drawings
- 6) Standard Specifications (Current Caltrans Standard Specifications)
- 7) General Conditions
- 8) Instructions to Bidders
- 9) CONTRACTOR'S Bid (Bid Form)
- 10) Notice Inviting Bids
- 11) Permits from other agencies as may be required by law.

- 3-3. COOPERATION - Attention is directed to Sections 5-1.20, "Coordination with Other Entities", and 5-1.36D, "Nonhighway Facilities", of the Standard Specifications and these special provisions.

The CONTRACTOR shall not adjust gas, electric, television cable, telephone, and Sonoma County structures. The CONTRACTOR will notify each agency who will be in turn adjust their own structures at least seven (7) working days prior to covering/burying these facilities at no cost to the CITY. Failure to do so shall result in the CONTRACTOR being liable for the utility agencies' claims.

- 3-4. OBSTRUCTIONS - Attention is directed to Sections 5-1.36D, "Non-highway Facilities", and 15, "Existing Facilities", of the Standard Specifications and these special provisions.

The CONTRACTOR's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the CONTRACTOR to protect the health, safety, and welfare of workmen and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine and toxic or flammable gases; natural gas in pipelines greater than 6 inches in diameter or pipelines operating at pressures greater than 60 psi (gage); underground electric supply system conductors or cables either directly buried or in duct or conduit which do not have concentric neutral conductors or other effectively grounded metal shields or sheaths; and underground electrical conductors with potential to ground of more than 300 volts.

The CONTRACTOR shall notify the ENGINEER and the appropriate regional notification center for operators of subsurface installations at least 5 working days prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire, or other structure. Regional notification centers include but are not limited to the following:

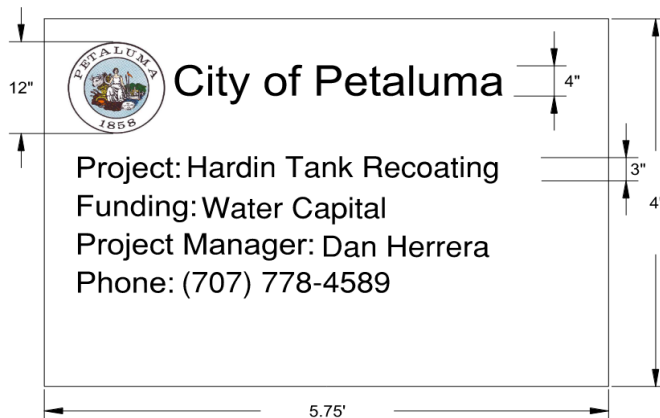
Underground Service Alert
Northern California (USA)
Telephone: 811

If the CONTRACTOR's certain operation is delayed, in the opinion of the ENGINEER, by the discovery of an underground utility not indicated on the plans or not marked by USA, the CONTRACTOR shall be paid a fair and reasonable compensation for the actual loss. Actual loss shall be understood to include no items of expense other than idle time of equipment exclusively used in such operation and necessary payments for idle time of labor exclusively required for such operation only, determined as follows:

- 1) Compensation for idle equipment shall be applied at the reduced Caltrans' Equipment Rental Rates where the right of way delay factor for each classification of equipment shall be applied to such equipment rental rate. No markup shall be applied for overhead or profit.
- 2) Compensation for idle time of labor shall be actual wages paid to the workers. No markup shall be added for overhead and profit.

- 3) The time for which such compensation will be paid will not exceed eight (8) hours for each incident.
 - 4) The CONTRACTOR shall be granted an extension of time for the delay.
 - 5) No monetary compensation will be allowed for delays due to utilities indicated on the plans or marked by USA.
- 3-5. **ORDER OF WORK** – The CONTRACTOR shall submit a work plan to the City for review and shall identify proposed order of work to maximize efficiency of construction, minimize impact to the community and maintain safety.
- 3-6. **PROJECT AND CONSTRUCTION AREA SIGNS** – Project sign and construction area signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, “Construction Area Traffic Control Devices”, of the Standard Specifications.

Two (2) project signs with a minimum dimension of 3’X4’X3/4" plywood bolted to an A-frame barricade shall be furnished, installed and moved from site to site by the Contractor. Letters and numbers shall be black on a white background. The sign information shall be as shown below:



The signs shall be approved prior to fabrication and posted as directed by the Engineer.

All costs involved in purchasing and installing construction area and project signs shall be considered as included in the Lump Sum price paid for Traffic Control System.

- 3-7. **MAINTAINING TRAFFIC** – Attention is directed to Sections 7-1.03, “Public Convenience”, 7-1.04, “Public Safety”, and 12, “Temporary Traffic Control”, of the Standard Specifications and the City of Petaluma Traffic Control Design and Construction Standards Series 700. Nothing in these special provisions shall be construed as relieving the CONTRACTOR from his/her responsibility as provided in said Section 7-1.04.

The Contractor will minimize disruption to all traffic (vehicular, transit, bicycle, and pedestrians) during the allowed work window. During construction, bicyclists will either share the road with vehicular traffic in a signed detour or be provided separate access. In addition, pedestrian access will be maintained at all times during construction. The Contractor shall provide temporary pedestrian curb ramps and clearly mark the temporary crosswalks. The pedestrian path shall be clear of any debris and meet ADA requirements. Driveway access to schools, residents, and businesses will also be maintained at all times.

Lane closures shall conform to the provisions in the section of these special provisions entitled, "Traffic Control System for Lane Closure".

At least five (5) working days prior to beginning of each phase of construction (i.e., piping installation, paving, pavement repair, concrete construction, etc.), the CONTRACTOR shall:

- A. Notify all adjacent residents, businesses, City of Petaluma Police and Fire, Green Waste Recovery (residential refuse service company), Waste Management Company (industrial refuse service company), and Petaluma Transit by written notices detailing the type, limits, date, and the hours of work. Details of the notice shall be submitted to the ENGINEER for review and approval at least five (5) days prior to delivering these notices.
- B. Where required, post streets with temporary "No Parking/Tow Away" signs at 100-foot intervals at least 72 hours in advance. These signs shall be furnished by the CONTRACTOR and shall state the date; day of week and hour parking is prohibited.

Illuminated traffic cones when used during the hours of darkness shall be affixed or covered with reflective cone sleeves as specified in Section 12-3.10, "Traffic Cones", of the Standard Specifications.

Full compensation for temporary delineation shall be considered as included in the prices paid for the contract in terms of work which obliterated the existing delineation, and no separate payment will be made therefore.

When working in or blocking any intersection, the CONTRACTOR shall provide flag persons to direct traffic at that intersection. This is in addition to other required flag persons.

Personal vehicles of the CONTRACTOR's employees shall not be parked on the traveled way, including any section closed to public traffic. The CONTRACTOR, at all times, shall provide flag person(s) to direct delivery trucks and CONTRACTOR's vehicles entering or leaving the public traffic.

The CONTRACTOR shall notify the City of Petaluma of his/her intent to begin work at least 5 days before work is begun. The CONTRACTOR shall cooperate with local authorities relative to handling traffic through the area and shall make his/her own arrangements relative to keeping the working area clear of parked vehicles.

Whenever vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed with fluorescent traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 cones or portable delineators shall be used for the taper. A C23 (Road Work Ahead) or C24 (Shoulder Work Ahead) sign shall be mounted on a

telescoping flag tree with flags. The flag tree shall be placed where directed by the ENGINEER.

A minimum of one (paved) reversible traffic lane, not less than 10 feet wide, shall be open for use by public traffic in with minimal delays, flaggers, adequate traffic control, and signing. *Flashing arrow boards shall be required for any lane closures.*

Day work: No work and/or preparation of work shall be performed between 6:00 p.m. and 7:00 a.m. unless approved by the ENGINEER in writing, except work required under said Sections 7-1.03 and 7-1.04 of the Standard Specifications or specified elsewhere in the special provisions.

Night work: Other than emergency work, there will be no night hours allowed for work on this project.

Except as otherwise provided, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays, after 5:00 p.m. on Fridays, on designated legal holidays, during the holiday shutdown period (in applicable areas), and when construction operations are not actively in progress.

Designated legal holidays and the holiday shutdown period are outlined in “Hours of Work” of these Special Provisions.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the CONTRACTOR if in the opinion of the ENGINEER public traffic will be better served and the work expedited. Such deviations shall not be adopted until the ENGINEER has indicated his/her written approval. All other modifications will be made by contract change order.

Ten (10) working days prior to commencing construction which will affect existing traffic, the contractor shall submit for review by the Engineer, a Traffic Control Plan on 11”x17” or 22”x34” sheet(s) of paper which contains only information specially related to work zone traffic control. If the Contractor proposes to use the latest edition of California Department of Transportation Manual of Traffic Controls for Construction and Maintenance of Work Zones in lieu of a traffic control plan, in specific work operations, he/she shall submit in writing for consideration which Typical Application Diagram will be used for each work operation. No work shall commence on Public / County / State right of way until a traffic control plan is approved and implemented.

In addition to the traffic control plan, the Contractor shall submit a haul route for approval by the Engineer. The route must minimize traffic on residential streets that are not part of the project. Temporary staging of construction materials shall not occur on streets or areas that are not within the immediate limits of the project.

The Traffic Control Plan shall contain a title block which contains the contractor’s name, address, phone number, project superintendent’s name, contract name, dates and hours traffic control will be in effect, and a space for review acknowledgement by the City.

The content of the Traffic Control Plan shall include, but not limited to, the following:

- A. Show location and limits of the work zone for each phase or specific operation of construction if requiring different traffic control.
- B. Give dimensions of lanes affected by traffic control that will be open to traffic.
- C. Indicate signing with MUTCD designation, cone placement (including spacing), changeable message signs, flashing arrow boards, pavement markings, and other methods of delineation and reference to appropriate standards and sign designations.
- D. Dimension location of signs and cone tapers.
- E. Location of any and all flagmen, if applicable.
- F. Identify side streets and driveways affected by construction and show how they will be handled.
- G. Show how pedestrian and bicycle traffic will be handled through the construction site during all hours including edge grinding operation.
- H. Show locations of nighttime lighting if applicable.
- I. Modification to Traffic Signal operations in the vicinity of the project. Contractor shall be responsible for making arrangements with the City's Traffic Signal Technician at least 48 hours in advance before starting any work in or nearby a signalized intersection if any signal operations need to be modified.
- J. Separate Traffic Control Plans shall be prepared for each phase of a construction project and shall be submitted for City's review and approval.

No work except for installation of project identification signs will be allowed to commence prior to approval of the Traffic Control Plan.

Residents, businesses, delivery to businesses, and customer parking shall be notified in writing by the Contractor at least five (5) calendar days prior to any activity that will impact access to their property.

The City of Petaluma Traffic Control Design and Construction Standards (Series 700) shown elsewhere in these specifications are guidelines only. The CONTRACTOR is not relieved from his/her responsibility for submitting his/her own traffic control plan.

The CONTRACTOR's failure to comply with the requirements of this section will be sufficient cause for the ENGINEER to suspend work at no cost to the City.

All costs involved for completing all work described in this section shall be considered to be included in the contract price paid for Traffic Control System and no additional compensation shall be allowed therefore.

- 3-8. TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE - A traffic control system shall consist of closing traffic lanes in accordance with the details shown on the plans, the City of Petaluma Traffic Control Design and Construction Standards Series 700, the provisions

of Section 12, "Temporary Traffic Control", of the Standard Specifications, and the provisions under "Maintaining Traffic" elsewhere in these supplementary general conditions.

The provisions in this section will not relieve the CONTRACTOR from his/her responsibility to provide such additional devices or take such measures as may be necessary to comply with the provisions in Section 7-1.04, "Public Safety", of the Standard Specifications.

During the hours of darkness, as defined in Division 1, Section 280, of the Vehicle Code, portable signs shown on the plans to be illuminated shall be, at the option of the CONTRACTOR, either; illuminated signs in conformance with the provisions in Section 12-3.06B(3), "Portable Signs", of the Standard Specifications; or Reflexite vinyl microprism reflective sheeting signs; or 3M high intensity reflectorized sheeting on aluminum substrate signs or Seibulite Brand Ultralite Grade Series, encapsulated lens retroreflective sheeting signs; or equal.

Each vehicle used to place, maintain, and remove components of a traffic control system on arterials and collectors shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing said components. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining, and removing of components of a traffic control system, and shall be in place before a lane closure requiring its use is completed.

If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the CONTRACTOR shall immediately repair said component to its original condition or replace said component and shall restore the component to its original location.

When lane closures are made for work periods only, at the end of each work period, all components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way shall be removed from the traveled way and shoulder. If the CONTRACTOR so elects, said components may be stored at selected central locations, approved by the ENGINEER, within the limits of the City right-of-way.

When traffic is shifted across the centerline, the CONTRACTOR shall provide W57 signs at 300-foot intervals and on both sides of intersections to direct traffic in proper lanes. Flashing arrow boards shall be required for any lane closures on any streets.

The adjustment provisions in Section 4-1.05, "Changes and Extra Work", of the Standard Specifications, shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the ENGINEER and will be made on the basis of the cost of the increased or decreased traffic control necessary. Such adjustment will be made on a force account basis as provided in Section 9-1.04, "Force Account", of the Standard Specifications for increased work, and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.05 of the Standard Specifications, will be paid for as a part of said extra work.

The contract lump sum price paid for "Traffic Control System" shall include full compensation for furnishing all labor (including flagging costs), materials, signs, tools, equipment and incidentals, and for doing all the work involved in furnishing, placing, operating, maintaining, repairing, replacing, changing messages on a **TWO** changeable message signs as requested by the Engineer, moving and removing the components of the traffic control system as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

- 3-9. WATERING - Watering shall conform to the provisions in Section 17, "Watering", of the Standard Specifications except that full compensation for developing water supply shall be considered as included in the prices paid for various contract items for work involving the use of water and no separate payment will be made therefore. The application of water for dust control will not be considered as extra work under any circumstances. Water can be purchased from the City at current rates provided that the CONTRACTOR meters the water so used with a City furnished meter (a deposit will be required) and a CONTRACTOR furnished valve assembly.
- 3-10. PROGRESS SCHEDULE - The CONTRACTOR shall submit a schedule which includes all major tasks and milestones to the City of Petaluma, Public Works and Utilities Department for review **at least** ten (10) working days prior to start of work.

After beginning of work, updated schedules shall be submitted. No progress payments will be processed without accepted updated schedules.

Payment for the original schedule and updated, weekly schedules shall be considered to be included in the various items of work and no additional compensation will be allowed therefore.

- 3-11. SUPERINTENDENCE - The CONTRACTOR shall designate in writing and submit to the Project Engineer two (2) working days before starting work, an authorized representative who shall have the authority to represent and act for the CONTRACTOR for the duration of the contract. Any change in the designation shall require prior approval of the ENGINEER.

When the CONTRACTOR is comprised of two (2) or more persons, firms, partnerships or corporations functioning on a joint venture basis, said CONTRACTOR shall designate in writing before starting work, the name of one authorized representative who shall have the authority to represent and act for the CONTRACTOR.

Said authorized representative shall be present at the site of work at all times while work is actually in progress on the contract. When work is not in progress and during periods when work is suspended, arrangements acceptable to the ENGINEER shall be made for any emergency work, which may be required.

If work is in progress and the authorized representative is not on site, the City reserves the right to stop the work at no cost to the City.

Once the work begins, the Superintendent shall keep the ENGINEER informed of the CONTRACTOR's daily schedule. The ENGINEER shall have at least twenty-four (24-hour advance notice of all work, on a daily basis, including SUBCONTRACTOR's work. If the CONTRACTOR fails to notify the ENGINEER, the ENGINEER reserves the right to stop the work at no cost to the City.

In the case of urgency or emergency where the CONTRACTOR's authorized representative is not present on any particular part of the work and where the ENGINEER wishes to give notification or direction, it will be given to and be obeyed by the superintendent or foreperson who may have charge of the particular work, or it will be given to and be obeyed by any worker in the area should the superintendent or foreperson not be immediately available.

All costs involved in superintendence shall be included in the contract prices paid for various items of work and no additional payment will be allowed therefore.

- 3-12. SAFETY REQUIREMENT - The CONTRACTOR shall comply with all CAL/OSHA safety requirements. It shall be the CONTRACTOR's sole responsibility for making sure these safety requirements are met and the CONTRACTOR shall fully assume all liabilities for any damages and/or injuries resulting from his or her failure to comply with the safety requirements. Failure on the City's part to stop unsafe practices shall, in no way, relieve the CONTRACTOR of his/her responsibility.

The CONTRACTOR shall first call City of Petaluma Emergency Center at 911, from a regular telephone, and (707) 762-2727 or from a cellular phone (707) 762-4545, if any gas lines or electrical power lines are broken or damaged.

- 3-13. PROJECT APPEARANCE – The CONTRACTOR shall maintain a neat appearance to the work area.

When practicable, debris developed during construction shall be disposed of concurrently with its removal. Stockpiling on the street shall not be allowed. The CONTRACTOR shall apply for a “stockpiling” permit from the City’s Community Development Department prior to stockpiling more than fifty (50) cubic yards of materials on private property. The CONTRACTOR shall solely be responsible for securing staging and/or stockpiling areas.

The CONTRACTOR shall provide dust control as often as required during the construction and shall clean the roads/streets with street sweepers at least once a day at the end of each working day or more often if safety or appearance conditions warrant. Failure to maintain dust control, street cleaning and/or any required work specified in this section shall result in the City performing the work with other forces and back charge the CONTRACTOR for the costs.

Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

- 3-14. RESPONSIBILITY FOR DAMAGE - The CONTRACTOR shall indemnify, hold harmless, release and defend the City of Petaluma, its officers, officials, employees and agents from and against any and all liabilities, claims, demands, losses, damages, expenses, costs (including without limitation costs and fees of litigation) of every nature arising out of or in connection with the activities of the CONTRACTOR, his/her subcontractors, employees and agents, except such loss or damage which was caused by the sole negligence or willful misconduct of the CITY, its employees or agents. The CITY may retain so much of the money due the CONTRACTOR as shall be considered necessary, until disposition has been made of claims or suits for damages as aforesaid.
- 3-15. GUARANTEE OF WORK - Neither the final certificate of payment nor any provision in the contract nor partial or entire use of the improvements embraced in this contract by the City or the public shall constitute an acceptance of work not done in accordance with the contract or relieve the CONTRACTOR of liability in respect to any warranties or responsibility for faulty materials or workmanship. The CONTRACTOR's attention is directed to Article 5, "Bonds and Insurance", of the General Conditions.
- 3-16. NOTICE TO PROCEED, BEGINNING OF WORK, CONTRACT TIME, TIME OF COMPLETION, AND LIQUIDATED DAMAGES – Article 2.3, "Commencement of Contract Times; Notice to Proceed" of the General Conditions is amended to read:

The CONTRACTOR shall begin work within ten (10) working days from the date of Notice to Proceed (NTP) and shall diligently prosecute the same to completion before the expiration of total allocated working days as specified in the Construction Agreement and/or Invitation to Bid, from the date of starting work. The CONTRACTOR shall complete all of the work directed by the ENGINEER in all parts and requirements within the time set forth. A working day is defined in these specifications.

The CONTRACTOR is on notice that it may take approximately eight (8) weeks from the bid opening to obtain the City Council's award of the contract, to process the construction agreement, and to issue the Notice to Proceed.

The CONTRACTOR shall pay to the City of Petaluma the sum of \$550 per day for each and every *calendar day's* delay in finishing the work in excess of the number of days prescribed above (and/or in excess of the number of days prescribed for any scheduled operations or works described in the Special Provisions).

A working day is defined as any day, except as follows:

- a. Saturdays, Sundays, and legal holidays
- b. Days on which the CONTRACTOR is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the ENGINEER, from proceeding with at least 75 percent of the normal labor and equipment force engaged on that

operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations.

Should the CONTRACTOR prepare to begin work at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and the CONTRACTOR does not proceed with at least 75 percent of the normal labor and equipment force engaged in the current controlling operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations, the CONTRACTOR will not be charged for a working day whether or not conditions should change thereafter during that day and the major portion of the day could be considered to be suitable for those construction operations.

Determination that a day is a non-working day by reason of inclement weather or conditions resulting immediately therefrom shall be made by the ENGINEER. The CONTRACTOR will be allowed 10 days from the issuance of the weekly statement of working days in which to file a written protest setting forth in what respects the CONTRACTOR differs from the ENGINEER; otherwise, the decision of the ENGINEER shall be deemed to have been accepted by the CONTRACTOR as correct. The ENGINEER will furnish the CONTRACTOR a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the contract, and the number of working days remaining to complete the contract and any time extensions thereof.

3-17. HOURS OF WORK

Weekdays – Weekdays (Monday through Friday) hours shall be from 7:00 a.m. to 5:00 p.m. for all required work except those hours approved by the City of Petaluma or specified in “Order of Work” Section of these special provisions. Work hours for County of Sonoma and Caltrans right of way shall be governed by their respective permit conditions.

Night Hours – Other than emergency work, there will be no night hours allowed on this project.

Liquidated Damages in the sum of Five Hundred Fifty Dollars (\$550) per day will be assessed against the CONTRACTOR if he fails to comply with any of the daily conditions or operations such as maintaining erosion control facilities, job site/street cleanliness and daily cleanup and traffic control and flagging, as described in the General Conditions, these Special Provisions, and the Technical Specifications.

If the CONTRACTOR closes a street or sidewalk without prior notice and approval of the ENGINEER within 24 hours, the associated operation will be shutdown at the CONTRACTOR’s expense.

Holidays - Designated legal holidays are: January 1st, the third Monday in January, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, the second Monday in October, November 11th, Thanksgiving Day, the day after Thanksgiving, December 24th and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday. The Contractor shall not work on the legal holidays unless approved in writing by the Engineer.

Holiday Shutdown - No work shall be allowed to be performed in the business district (defined by the map on the City of Petaluma web site at <http://cityofpetaluma.net/cdd/pdf/boundaries.pdf>) between Thanksgiving Day, the day after Thanksgiving, and December 25th thru January 3rd of the following year.

- 3-18. RECORD ("AS-BUILT") DRAWINGS – The CONTRACTOR shall furnish Record Drawings of the complete project and procure from the Director of Public Works a full-sized set of Contract Drawings. Construction drawings shall be on the construction site at all times while the work is in progress. Drawings shall show approved substitutions, if any, of material including manufacturer's name and catalog number. The Drawings shall be to scale, and all indications shall be neat and legible. All information noted on the CONTRACTOR's job-site print shall be transferred to the Record Drawings by CONTRACTOR and all indications shall be recorded in a neat, legible, and orderly way. The Record Drawings shall be signed by the CONTRACTOR and turned over to the Director of Public Works before the final acceptance of the project. If the CONTRACTOR fails to provide the City with an acceptable “Record Drawings”, the City shall deduct \$2,000 from the amount due CONTRACTOR.

- 3-19. NOTICE OF POTENTIAL CLAIM - If for any reason the CONTRACTOR deems that additional compensation is due him/her for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized extra work, a Notice of Potential Claim shall be made. The CONTRACTOR shall give the ENGINEER a written Notice of Potential Claim for such additional compensation before work begins on the items on which the claim is based. The notice shall set forth the reasons for which the CONTRACTOR believes additional compensation will or may be due and the nature of the costs involved. The CONTRACTOR shall afford the ENGINEER every opportunity and facility for keeping records of the actual cost of the work. The CONTRACTOR shall keep records of the disputed work in accordance with Contract General Conditions, Section 11.3, "Cost of Work (Based on Time and Materials)."

If such notification is not given or the ENGINEER is not afforded proper opportunity by the CONTRACTOR for keeping strict account of actual cost as required, then the CONTRACTOR hereby agrees to waive any claim for such additional compensation. Such notice by the CONTRACTOR and the fact that the ENGINEER has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the CONTRACTOR shall, within 10 calendar days, submit his/her written claim to the ENGINEER who will present it to the City for consideration in accordance with local laws or ordinances. The CONTRACTOR is directed to Section 17.20 "Resolution of Construction Claims" of the General Conditions.

Any claim for overhead type expenses or costs, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any claim for overhead shall also be subject to audit by the City at its discretion.

Any costs or expenses incurred by the City in reviewing or auditing any claims that are not supported by the CONTRACTOR's cost accounting or other records shall be deemed to be damages incurred by the City within the meaning of the California False Claims Act.

Nothing in this subsection shall be construed as a waiver of the CONTRACTOR's right to dispute final payment based on differences in in-place quantity measurements or computations of unit priced pay items.

- 3-20. PAYMENT FOR MATERIALS ON HAND - At the discretion of the ENGINEER, partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the requirements of the contract, plans, and specifications. Such delivered costs of stored or stockpile materials may be included in the next partial payment after the following conditions are met:

1. The material has been stored or stockpiled and protected at the sole expense of the CONTRACTOR at a location acceptable to the City and in a manner acceptable to the ENGINEER.
2. The CONTRACTOR has furnished the ENGINEER with acceptable evidence of the quantity and quality of such stored or stockpiled materials.

3. The CONTRACTOR has furnished the ENGINEER with satisfactory evidence that the material and transportation costs have been paid.
4. The CONTRACTOR has furnished the City legal title (free of liens or encumbrances of any kind) to the material so stored or stockpiled.
5. The CONTRACTOR has furnished the City evidence that the material so stored or stockpiled is insured against loss by damage to or disappearance of such materials at anytime prior to use in the work.
6. The CONTRACTOR shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this subsection.

It is understood and agreed that the transfer of title and the City's payment for such stored or stockpiled materials shall in no way relieve the CONTRACTOR of his/her responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans, and specifications. In no case will the amount of partial payments for materials on hand exceed 70% of the contract price for the contract items in which the material is intended to be used.

- 3-21. ACCESS TO DRIVEWAYS – All accesses for local businesses and residents shall be maintained at all times. Temporary ramps will be required each night for access to driveways for residences and commercial access. The Contractor shall coordinate with each driveway user as needed.
- 3-22. ARCHAEOLOGICAL MONITORING – In the event that archaeological materials are found during construction, CONTRACTOR shall notify the ENGINEER immediately and shall temporarily cease work in the area until a determination or investigation of the site can be made by a qualified archaeologist. Archaeologist services shall be provided by the City at no cost to the CONTRACTOR.
- 3-23. STORM WATER MANAGEMENT, AND SEDIMENT AND EROSION CONTROL – CONTRACTOR shall prepare storm water management, and sediment and erosion control measures for implementation and shall maintain these measures during the construction period as required by the Regional Water Quality Control Board (RWQCB) permit.

If the area to be disturbed by construction activities is more than one acre, the CONTRACTOR shall be required to file a Notice of Intention (NOI), pay the fee, prepare the SWPPP, BMP, etc. as required by RWQCB permit.

Storm water management, and sediment and erosion control shall include, but not be limited to fiber rolls (sediment logs or wattles), straw bales, drain rock, check dams, silt fencing, siltation basins and as required for construction conditions. Measures shall be submitted to the ENGINEER for review seven (7) days prior to start of construction. The CONTRACTOR shall be responsible for providing the measures that would comply with the RWQCB.

The CONTRACTOR shall also place drain rock bags around storm drain inlets/catch basins and install drain rock check dams at 50-foot intervals within 100 feet upstream from the inlets/catch basins.

The CONTRACTOR shall comply with all Federal, State and local regulations and ordinances governing storm water pollution prevention.

If required, the CONTRACTOR shall file a Notice of Intent (NOI) with the RWQCB and shall comply with the National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Association with Construction Activity requirements. The CONTRACTOR shall prepare and implement a Storm Water Pollution Plan (SWPPP). Resources used in developing the SWPPP shall include the “California Storm Water Best Management Practice Handbook for Construction Activity,” and the San Francisco Bay Regional Water Quality Control Board’s “Information on Erosion and Sediment Controls for Construction Projects.” The SWPPP shall be submitted for review and acceptance prior to start of work. The CONTRACTOR shall have an accepted and implemented SWPPP as part of Mobilization. The SWPPP shall, at a minimum, include Best Management Practices (BMPs), acceptable to the City, to address the following:

1. Housekeeping
2. Waste Containment and Control.
3. Minimizing Disturbed Areas.
4. Stabilize Disturbed Areas.
5. Protect Slopes and Channels.
6. Control Site Perimeter.
7. Control of Internal Erosion.
8. Disposal of Storm Water and Ground Water
9. Sediment Control.
10. Liquid Waste Management.
11. Concrete Waste Management.
12. Hazardous Waste Management.
13. Employee and SUBCONTRACTOR Training.
14. Vehicle and Equipment Fueling and Maintenance.
15. Spill Prevention and Control.

16. Contaminated Soil Management.

17. Sawcutting.

18. Paving and Asphalt Work.

19. Street Cleaning.

Employ and utilize environmental protection methods, obtain all necessary permits, and fully observe all local, state, and federal regulations.

All costs involved for completing all work described in this section shall be considered to be included in the contract price paid for Storm Water Management and Sedimentation/Erosion Control and no additional compensation shall be allowed therefore.

3-24. ITEM INCREASES AND DECREASES -

Increased or Decreased Quantities

Increases or decreases in the quantity of a contract item of work will be determined by comparing the total pay quantity of that item of work with the ENGINEER's Estimate therefor.

If the total pay quantity of any item of work required under the contract varies from the ENGINEER's Estimate therefore by 25 percent or less for increases and 25 percent or less for decreases, payment will be made for the quantity of work of the item performed at the contract unit price.

If the total pay quantity of any item of work required under the contract varies from the ENGINEER's Estimate therefor by more than 25 percent for increases and 25 percent for decreases, in the absence of an executed contract change order specifying the compensation to be paid, the compensation payable to the CONTRACTOR will be determined in accordance with the following sections.

Increases of More Than 25 Percent

Should the total pay quantity of any item of work required under the contract exceed the ENGINEER's Estimate therefore by more than 25 percent, the work in excess of 125 percent of the estimate and not covered by an executed contract change order specifying the compensation to be paid therefor will be paid for by adjusting the contract unit price based upon a force account analysis.

The adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost which will be determined as hereinafter provided, of the total pay quantity of the item. If the costs applicable to the item of work include fixed costs, the fixed costs will be deemed to have been recovered by the CONTRACTOR by the payments made for 125 percent of the ENGINEER's Estimate of the quantity for the item, and in

computing the actual unit cost, the fixed costs will be excluded. Subject to the above provisions, the actual unit cost will be determined by the ENGINEER in the same manner as if the work were to be paid for on a force account basis.

When the compensation payable for the number of units of an item of work performed in excess of 125 percent of the ENGINEER's Estimate is less than \$5,000 at the applicable contract unit price, the ENGINEER reserves the right to make no adjustment in the contract unit price if the ENGINEER so elects, except that an adjustment will be made if requested in writing by the CONTRACTOR.

Decreases of More Than 25 Percent

Should the total pay quantity of any item of work required under the contract be less than 25 percent of the ENGINEER's Estimate therefore, an adjustment in compensation pursuant to this Section will not be made unless the CONTRACTOR so requests in writing. If the CONTRACTOR so requests, the quantity of the item performed, unless covered by an executed contract change order specifying the compensation payable therefor, will be paid for by adjusting the contract unit price based upon a force account analysis. In no case shall the payment for that work be less than that which would be made at the contract unit price.

The adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item, including fixed costs. The actual unit cost will be determined by the ENGINEER in the same manner as if the work were to be paid for on a force account basis; or the adjustment will be as agreed to by the CONTRACTOR and the ENGINEER.

The payment for the total pay quantity of the item of work will in no case exceed the payment which would be made for the performance of 25 percent of the ENGINEER's Estimate of the quantity for the item at the original contract unit price.

- 3-25. EXISTING WATER VALVES, MONUMENTS AND MANHOLES – The City shall have access at all times to water valves, monuments, and manholes except immediately following a construction operation as noted below.

Prior to placement of paving, all manholes, monuments, and valves covered by paving, shall be clearly marked in white paint before the close of that work day. Throughout the construction process, the CITY shall have access to manholes, monuments, and valves within 48 hours of any operation affecting the manholes, monuments and valves.

A penalty of Fifty Dollars (\$50) per each valve, monument, and manhole that is not raised, or that the CITY is not provided easy access to, will be assessed against the contractor for each calendar day.

- 3-26. WAGE RATES - The General Prevailing Wage Determination Made by the Director of Industrial Relations Pursuant to California Labor Code Part 7, Chapter 1, Article 2, Sections 1770, 1773 and 1773.2. The CONTRACTOR can download this information from the web site: <http://www.dir.ca.gov/dlsr/PWD/>

The most current prevailing wage rates available at the time of bid opening shall be used.

- 3-27. STORAGE AREA – The Contractor is responsible to locate a suitable area for storage for materials. The project site has limited availability in areas used for storing of equipment and materials. Contractor shall field verify conditions and determine if area is adequate to facilitate work and storage. Any additional areas needed for storage are the responsibility of the Contractor.
- 3-28. CORROSION PROTECTION – The work includes removal of the existing impressed current corrosion protection for the tank. The Contractor shall coordinate with the City’s corrosion protection specialist for placement of the new corrosion protection system.
- 3-29. RESERVOIR DEWATERING COORDINATION – The Contractor shall coordinate the dewatering operations with City staff. The tank shall be taken offline for a minimum of one week prior to dewatering of the tank, to allow for troubleshooting of SCADA operations. Upon direction from the Engineer, the Contractor shall commence dewatering operations. The Contractor is responsible for all work, equipment, pumps, materials and appurtenances used in the dewatering operations. The Contractor, to the extent possible, shall pump water from the existing reservoir into the system, to minimize the amount of water wasted or discharged.
- 3-30. SAMPLING STATION COORDINATION – The Contractor is responsible for installing the pipe penetrations for the sampling station. The Contractor shall coordinate with City staff for the new location of the sampling station.
- 3-31. ELECTRICAL SUBMITTALS – The Contractor shall submit electrical submittals as soon as possible to prevent any delays in the project schedule.
- 3-32. COATING SCHEDULE – The Contractor shall provide a schedule that ensures all coating work will finish before the rainy season begins.

SECTION IV
TECHNICAL SPECIFICATIONS

Hardin Tank Improvements

City of Petaluma

Technical Specifications

April 2024



Prepared By:

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SECTION 01 11 00 – SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Project description.
 - 2. Description of bid items.
 - 3. Coordination.
 - 4. List of drawings.

1.02 PROJECT DESCRIPTION

- A. The work specifically includes all work as represented by the Drawings, the Specifications and all other Contract Documents issued for construction and subsequent approved revisions and addenda.
- B. The work generally includes removing all interior and exterior tank coatings, preparing all steel surfaces, and recoating per the specifications. Tank improvements will include the addition of steel handrailing on the roof, new roof vents, replacement of the level indicator, replacement of the interior ladder, replacement of roof rafter ties and minor piping improvements. Control and isolation valves will be replaced in the valve vault next to the tank. Electrical work will include a new electronics cabinet, intrusion switches and site lighting.

1.03 DESCRIPTIONS OF BID ITEMS

- A. Bid Items are presented to indicate major categories of the work for purposes of comparative bid analyses and payment breakdown for monthly progress payments. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified.
- B. Quoted prices accepted by the Owner shall be held good and in effect until the Work is completed and accepted by the Owner, unless modified by Change Order.
- C. Compensation for all plant, equipment, tools, materials, labor, service, travel, and incidentals, and for doing the work and all other items required to complete the Work in conformity with the Contract Documents will be included in the payment provided in this Section unless specifically excluded. No other compensation will be made except for the items listed in the Bid Proposal. Work for which no separate payment has been provided will be considered as a subsidiary obligation of the Contractor, and the cost therefore included in the applicable contract price for the item to which the work applies. All measurements of work done will be made by the Engineer. No adjustment in prices will be made where any quantities provided in the Item Description vary from actual quantities, unless the work described and shown in the Contract Documents has been modified by the Owner.

D. Base Bid Items

1. Mobilization and Demobilization: Mobilization shall include obtainment of all permits, bonds and insurance, moving of all equipment onto the site, temporary buildings if needed, and other construction facilities as required for the proper performance and completion of the work. Demobilization shall include, but not be limited to, removal of all equipment, unused materials, all temporary utilities, job trailers and all temporary communication facilities.
2. Interior Tank Coatings: This bid item shall include all labor, material, and equipment necessary to furnish, prepare and construct the interior coatings for the tank, rafters, interior of vents and hatches, tank interior piping including the mixing system, and internal tank appurtenances. The work shall generally include but not be limited to removal of existing coatings, surface preparation, abrasive blasting, handling of removed coatings and spent abrasive in accordance with all environmental and safety regulations regarding removal, handling, and disposal, cleaning, inspection, application of primer, intermediate and finish coats, stripe coating, curing, environmental controls in compliance with coatings manufacturer's recommendations including ventilation, temperature and humidity control, disinfection, testing, new manway gaskets and other work incidental thereto, complete in accordance with the Drawings and as specified herein.
3. Exterior Tank Coatings: This bid item shall include all labor, material, and equipment necessary to furnish, prepare and construct the exterior coatings for the tank, tank exterior exposed piping, electrical cabinets, and external tank appurtenances including but not limited to handrails and guardrails, roof vents, hatches and manways and stairs. The work shall generally include but not be limited to removal of existing coatings, surface preparation, abrasive blasting, handling of removed coatings and spent abrasive in accordance with all environmental and safety regulations regarding removal, handling, and disposal, dust containment, cleaning, inspection, application of primer, intermediate and finish coats, stripe coating, curing, environmental controls in compliance with coatings manufacturer's recommendations including ventilation, temperature and humidity control, testing, and other work incidental thereto, complete in accordance with the Drawings and as specified herein.
4. Valve Vault Improvements: This bid item shall include all labor, material, and equipment necessary to furnish, prepare and construct the improvements within the valve vault including replacing the following: 6-inch inlet control valve, 2 each 6-inch gate valves, 16-inch outlet check valve, 2 each 16-inch butterfly valves, 3-inch combination air release valve, and miscellaneous fittings and appurtenances. This item shall include the removal and disposal of valves and fittings to be replaced, all pipe and fittings required to install the valves in the vault, onsite operational adjustments and training by a manufacturer's technical representative for the control valve, protective coatings, removal of the irrigation pump, capping of irrigation pipes, testing, and other work incidental thereto, complete in accordance with the Drawings and as specified herein.
5. Tank Appurtenance Improvements: This bid item shall include all labor, material, and equipment necessary to furnish, prepare and construct the tank appurtenance improvements including the perimeter roof vents, perimeter roof guardrails, overflow pipe modifications, replacement of the level indicator, removal and

replacement of the internal ladder, removal of the internal grated platform, modifications to the external and internal sensing piping including modification to the water sampling station, replacing expanded metal and screen for the center vent, new gaskets for hatches and manways, replacement of hand hole covers on the roof, handling and disposal of all items to be removed, welding, cutting, capping, pipe and fittings as necessary, and other work incidental thereto, complete in accordance with the Drawings and as specified herein.

6. Replace Rafter Ties: This bid item shall include all labor, material, and equipment necessary to remove, furnish, prepare, and construct the replacement of rafter tie rods designated by the engineer for replacement after initial abrasive blasting including welding, and other work incidental thereto, complete in accordance with the Drawings and as specified herein.
7. Door Sheet: This bid item shall include all labor, material, and equipment necessary to cut out, store and replace the door sheet in the shell of the tank for equipment access to the interior, including but not limited to cutting, removal, temporary storage, replacement, full-penetration butt welding and complete radiographic testing of the full length of all associated welds complete in accordance with the AWWA D100, Section 11, the Drawings and as specified herein.
8. Electrical Work: This bid item shall include all labor, material, and equipment necessary to complete all electrical work, including but not limited to conduit, wiring, weather protective enclosures, replacing or adding intrusion switches, new electrical cabinet, removal and later replacement of cathodic protection devices and cabinet, removal of electrical cabinets for tank coating, replacing or relocating electrical components from old cabinet to new cabinet, site lighting, vault lighting and start-up, testing, and commissioning as required, complete in accordance with the Drawings and as specified herein.

E. Alternate Bid Items

1. Item A - Seal Welding Roof Plates: This bid item shall include all labor, material, and equipment necessary to seal weld the bottom joints on all steel roof plate joints including surface preparation and cleaning, lifting plates off the rafters as needed, welding, grinding and other work incidental thereto, complete in accordance with the Contract Documents and as specified herein.
2. Item B - Seal Welding Rafters: This bid item shall include all labor, material, and equipment necessary to seal weld the rafters to the tank roof including surface preparation and cleaning, welding, grinding and other work incidental thereto, complete in accordance with the Contract Documents and as specified herein.

The work to be performed under these specifications is at the City of Petaluma's Hardin Tank located on Hardin Lane in Petaluma, California.

1.04 COORDINATION

- A. Coordinate with operations and maintenance personnel to maintain uninterrupted operation of critical site equipment.

1.05 TANK SUMMARY TABLE

Year Constructed	1991
Nominal Capacity	1,000,000 Gallons
Shell Diameter	90 Feet
Shell Height	20 Feet
Shell Manways	2 each, 30-Inch Diameter
Knuckle Radius	3 Feet
Interior Columns (8" I-Beams)	1 Center
Roof Hatches	2 Each, 36x36 Inch
Roof Access	Circular Staircase with Intermediate Landing

1.06 PROJECT WORK ITEMS (MINOR ITEMS OMITTED)

- A. Remove all coatings, prepare and recoat interior and exterior of tank.
- B. Replace 6-inch inlet control valve in vault.
- C. Replace 2-each 6-inch gate valves in vault.
- D. Replace 16-inch outlet check valve in vault.
- E. Replace 2-each 16-inch butterfly valves in vault.
- F. Replace 3-inch combination air release valve in vault.
- G. Modify control valve sensing lines.
- H. Add duckbill check valve to end of 10-inch steel overflow pipe.
- I. Remove internal ladder and replace with stainless steel ladder with new supports.
- J. Remove internal grated platform.
- K. Install new steel guardrail around perimeter of roof.
- L. Install 3-each perimeter roof vents.
- M. Replace level indicator.
- N. Replace 40-each corroded rafter ties.
- O. Electrical: replace two intrusion switches, add one intrusion switch, install new electrical cabinet, add site lighting and lighting in the valve vault.

Alternate Bid Item A. - Seal welding the underside of the steel roof plates.

Alternate Bid Item B. - Seal welding the 40 roof rafters roof rafters to the roof.

1.07 LIST OF DRAWINGS

A. The set of 11 (eleven) Drawings is dated April, 2024. Drawings are as follows:

DWG. NO.	TITLE
1.	Cover Sheet
2.	Abbreviations, Legend & Notes
3.	Site Plan
4.	Details
5.	Details
6.	Details
7.	Details
8.	Electrical Symbols & Abbreviations
9.	Electrical Cabinet
10.	Typical Electrical Details
11.	Electrical Site Plan

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 14 00 - WORK RESTRICTIONS AND COORDINATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Restrictions on workdays and hours.
 - 2. Locating and protecting existing utilities.
 - 3. Project coordination between trades, including but not limited to, electrical and mechanical work on the Project.
 - 4. Partial occupancy requirements.

1.02 CONTRACTOR USE OF SITE

- A. The Contractor shall confine operations at Site to areas designated by Contract Documents, permits, ordinances, and laws.
- B. The Contractor shall not unreasonably encumber Site with materials or equipment.
- C. The Contractor shall assume full responsibility for protection and safekeeping of products stored on premises.
- D. The Contractor shall move any stored products that interfere with operations of Owner or other contractor.
- E. The Contractor shall coordinate parking, storage, staging, and work areas with Owner.
- F. Contractor may use the area within the City property fence at the tank site for storage of equipment and materials.

1.03 WORKDAYS AND HOURS

- A. All construction activity, except for emergency situations, will be confined to weekday daylight hours to minimize nuisances to surrounding residents. The days and hours of work shall be confined to the hours of 7:00 AM to 6:00 PM Monday thru Friday. This restriction includes deliveries of materials and equipment and servicing of construction equipment on the project site. If special circumstances require construction outside these hours, the Contractor may request and the Owner may approve additional times as necessary.
- B. Any work scheduled by the Contractor on non-working days (Saturdays, Sundays, and Owner Legal Holidays) shall be verified with the Owner at least 72 hours in advance. The Owner shall be reimbursed for project management and inspection work, at a personnel's standard charge out rate, for any work on non-working days and for overtime. Any work designated to have a special time frame shall be so noted on the drawings and/or elsewhere in these specifications and shall be excluded from this reimbursement.

1.04 EXISTING UTILITIES

- A. Obtain the best available current information on location, identification and marking of existing utilities, piping, conduits and other underground facilities before beginning any excavation. The Owner has endeavored to determine the existence of utilities at the work site from the records of known utilities in the vicinity of the work. The positions of these utilities, as derived from such records, are shown on the drawings. The service connections to these utilities may not be shown on the drawings.
- B. A minimum of 48 hours in advance of excavation activities, the Contractor shall contact the following parties to ascertain and verify the existence and location of utility lines and facilities and shall coordinate all work in accordance with the information obtained from such inquiries in order to prevent damage to such lines and facilities:
- Underground Service Alert (USA) (dial 1-800-642-2444 or dial 811);
 - the Owner; and
 - the utility owner.
- C. The Contractor shall make its own investigations, including exploratory excavations, to determine the locations and type of existing service laterals or appurtenances when their presence can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the work site.
- D. The Contractor shall use extreme care when excavating or working in areas that may contain existing utilities, process piping, conduits or other underground facilities. Use careful potholing, hand digging and probing to determine the exact location of underground installation.
- E. Some locations contain multiple pipes or conduits. Prior to performing any subsurface work, investigate, determine, and prepare a plan to turn off or disconnect each utility believed to be within 100 feet of the subsurface work in the event of an accidental breach of a utility conduit.
- F. Where connections to existing utilities or other underground facilities is required or where new piping or conduits may cross or interfere with existing utilities or underground facilities, carefully excavate and uncover existing installations to a point one foot below the pipe or conduit to determine the actual elevation and alignment. Call the Owner's attention to differing existing conditions that may require a clarification or change.

1.05 PROJECT COORDINATION

- A. General
1. Coordinate the work; do not delegate responsibility for coordination to any subcontractor.
 2. Anticipate the interrelationship of all subcontractors and their relationship with the total work.
 3. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of work between sections. The

Contractor's decisions, if consistent with the Contract Documents, shall be final. The Engineer is not required to coordinate work and will not do so.

4. Coordinate the work of subcontractors and material suppliers, so that their work is performed in a manner to minimize interference with existing operations at the site and to facilitate the progress of the work.
 5. Be responsible for providing anchorage, blocking, joining and other detailing as required to provide complete project.
 6. Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.
 7. Do not cover any piping, wiring, ducts, etc., until properly inspected and approved and until proper certificates have been issued.
 8. Coordination with Other Contracts: Coordinate work of this Contract with other contracts and contractors as appropriate.
 9. This work shall be coordinated with all associated work in a manner that will ensure that all work will be accomplished as rapidly as the progress of the project will permit and so that no work will be delayed for want of associated work.
- B. Electrical Coordination
1. Work out all "tight" conditions involving work of various sections in advance before installation. If necessary, and before work proceeds in these areas, prepare supplementary drawings for review showing all work in "tight" areas.
 2. Provide supplementary drawings and additional work necessary to overcome "tight" conditions at no increase in contract price. Refer to Section 01 3300, Submittals.

1.06 PARTIAL OCCUPANCY/UTILIZATION REQUIREMENTS

- A. Allow Owner to take possession of and use any completed or partially completed portion of the Work during the progress of the Work as soon as is possible without interference to the Work.
- B. Possession, use of Work, and placement and installation of equipment by Owner shall not in any way evidence the completion of the Work or any part of it.
- C. Unless caused by defect due to faulty construction, Contractor shall not be held responsible for damage to the occupied part of the Work resulting from Owner occupancy.
- D. Make available, in areas occupied, on a 24-hour per day and 7-day per week basis if required, any utility services, in condition to be put in operation at the time of occupancy. Responsibility for operation and maintenance of said equipment shall remain with Contractor.
- E. Use and occupancy by Owner prior to acceptance of Work does not relieve Contractor of its responsibility to maintain insurance and bonds required under the Contract until entire Work is completed and accepted by Owner.

City of Petaluma
Hardin Tank Improvements

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes the following procedures:
 - 1. Payment Submittals
 - 2. Descriptions of Base Bid Items
 - 3. Contractor's Schedule of Values
 - 4. Application for Payment
 - 5. Payment
 - 6. Permits
 - 7. Nonpayment for Rejected or Unused Products
 - 8. Partial Payment for Stored Materials and Equipment

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Submit a Schedule of Values as a hardcopy and electronically in Excel on Contractor's standard form.
 - 2. Submit application for payments.
 - 3. Final Application for Payment

1.03 DESCRIPTIONS OF BASE BID ITEMS

- A. The Bid Amounts for each Bid Item will be used for comparative bid analysis. The Bid amounts will also form the basis of monthly progress payments. Each Lump Sum bid amount will undergo further breakdown as described later in this section. Unit prices for any unit price bid items will be the basis for monthly progress payment determinations and for any changes related to that Work item.

1.04 CONTRACTOR'S SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for each schedule of the Work under the Agreement.
- B. Upon request of the Engineer, provide documentation to support the accuracy of the Schedule of Values.
- C. An unbalanced or front end loaded schedule will not be acceptable.
- D. Submit Schedule of Values in a spreadsheet format compatible with the latest version of Excel.
- E. For Unit Price work, reflect the unit price quantity and unit cost from the conformed Bid Forms.

- F. For work to be performed for a lump sum amount, the Contractor shall submit a Schedule of Values to the Owner prior to the first payment and within fifteen (15) days after Notice to Proceed. The Schedule of Values, as agreed upon by the Contractor and the Owner, shall be used for preparing future estimates for partial payments to the Contractor, and shall list the major items of work with a price fairly apportioned to each item.
- G. The cost breakdown shall be generally in the same format as the Contract specifications divisions and subdivisions, with major items of work listed individually. The cost breakdown shall be by structure, civil, mechanical, electrical, or other logical division of work. The cost breakdown for architectural, structural, mechanical, and electrical work shall include separate items for identifiable portions of the Work. The cost breakdown shall include separate allowances for any testing and startup work required. Measurable approximate quantities of work performed by the Contractor or its subcontractors shall be provided. For quantities that are the sum total of several individual quantities, backup summaries shall be provided which list the individual descriptions and quantities. These summaries then will be used to determine the quantities of work in place in subsequent progress payment requests.
- H. The above is a statement of the intent of the Contract Documents to provide a high level of detail, acceptable to the Owner, to allow a fair and reasonable estimate to be made of the value of work installed. The detail of the cost breakdown must be sufficient to provide timely processing of the monthly progress payment request.
- I. The cost breakdown will be subject to the approval of the Owner, and upon request, the Contractor shall substantiate the price for any or all items and provide additional level of detail, including quantities of work. The cost breakdown shall be sufficiently detailed to permit its use by the Owner as one of the bases for evaluating requests for payments. The Owner shall be the sole judge of the adequacy of the cost breakdown.
- J. The cost breakdown shall be solely used to determine progress payments. The cost breakdown shall not be considered in determining payment or credit for additional or deleted work.

1.05 APPLICATION FOR PAYMENT

- A. Attach one transmittal summary form with each detailed application for payment for each schedule and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of Contractor.
- B. Use a detailed Application for Payment Form suitable to Engineer.
- C. Provide separate form for each schedule as applicable.
- D. Include accepted Schedule of Values for each schedule portion of lump sum Work and the unit price breakdown for the Work to be paid on a unit priced basis.

- E. Include separate line items for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such as requested by the Engineer.
- F. In preparation of payment, round all values to the nearest dollar. Submit Application for Payment, including a Transmittal Summary and detailed Application for Payment Form(s) for each schedule as applicable, a listing of materials on hand for each schedule and such supporting data as may be requested by the Owner.

1.06 PAYMENT

- A. Payment will be made at the contract unit price, which shall include full compensation for furnishing all labor, materials, tools and equipment and for performance of all the work required to construct the Hardin Tank Improvements, as summarized in Section 01 11 00 Summary of Work.

1.07 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for the following
 1. Loading, hauling and disposal of rejected equipment.
 2. Quantities of material wasted or disposed of in a manner not called for under the Contract Documents.
 3. Rejected loads of material, including material rejected after it has been placed.
 4. Material refused for unloading from transporting vehicle.
 5. Defective Work not accepted by Owner.
 6. Material remaining on hand after completion of Work.

1.08 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings and preliminary Operation and Maintenance data is acceptable to Engineer.
- B. Final Payment: will be made only for products incorporated in the Work. Remaining products, for which partial payments have been made, shall revert to Contractor unless agreed, and partial payments made for those items will be deducted from the final payment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 25 00 – SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish and install products specified, under options and conditions for substitutions stated in this Section.

1.02 PRODUCT LIST

- A. Submit five (5) copies of complete list of major products which are proposed for installation.
- B. Tabulate products by Specification Section number and title.
- C. For products specified only by reference standards, list each such product:
 - 1. Name and address of manufacturer.
 - 2. Trade name.
 - 3. Model or catalog designation.
 - 4. Manufacturer's data:
 - a. Reference standards.
 - b. Performance test data.

1.03 CONTRACTOR'S OPTIONS

- A. **TRADE NAMES AND ALTERNATIVES:** Whenever any material or equipment is specified by patent or proprietary name or by the name of the manufacturer, such specification shall be considered as used for the purpose of describing the material or equipment desired and shall be considered as if followed by the words "or acceptable equal", whether or not such words appear. In the event any material or equipment is specified by only one patent or proprietary name or by the name of only one manufacturer, it is for the purpose of standardization or because the Engineer knows of no equal. The Contractor may offer material or equipment with equal or better qualities of performance, operation, and maintenance in substitution for those specified which he considers would be in the Engineer's interest to accept. No offers for substitution will be acknowledged or considered from suppliers, distributors, manufacturers, or subcontractors.

Any such offer shall be made in writing to the Engineer for his consideration at least four weeks in advance of the time at which the Contractor wishes to order the material or equipment for use in the work. The Contractor shall include with his offer sufficient data, which together with any other data the Engineer may require, will enable the Engineer to assess the acceptability of the material or equipment. When the substitute equipment or material necessitates changes to or coordination with any other portion of the work, the data submitted shall include drawings and details showing all such changes and the Contractor shall perform these changes as a part of any acceptance of substitute

material or equipment. The use of any material or equipment so offered will be permitted only after written acceptance of the Contractor's offer by the Engineer. Such acceptance by the Engineer shall not relieve the Contractor from full responsibility from the efficiency, sufficiency, and quality and performance of the substitute material or equipment, in the same manner and degree as the material and equipment specified by name. Between the dates of public notice of advertisement and the bid opening, the Owner will not, under any circumstances, review or entertain any proposals for the acceptability of equipment or materials for inclusion into the contract documents.

1.04 SUBSTITUTIONS

- A. Catalog numbers and specific brands or trade names followed by the designation "or approved equal" are used in conjunction with material and equipment required by the Specifications to establish the standard of quality, utility, and appearance required.
1. "Quality" features include, but are not limited to, materials and methods of construction, standards compliance, listings, ratings, corrosion resistant finishes, durability, reliability, and the local service organization's capabilities and responsiveness.
 2. "Utility" features include, but are not limited to, size, performance, capacity, quiet operation, efficiency, controllability, points of connection, and accessibility.
 3. "Appearance" features include, but are not limited to, size, color, finish, and other visual characteristics.
 4. Owner's Representative will accept in writing proposed substitutions that are, in the Owner's Representative's opinion, equal in quality, utility, and appearance to the material or equipment specified.
 5. All substitutions must be accepted in writing by the Engineer. Contractor shall submit to the Engineer, within thirty-five (35) days after the date of commencement specified in the Notice to Proceed, or prior to purchase and installation, a typewritten list containing a description of each substitute material or equipment.
 - a. The thirty-five (35) day submittal period does not excuse Contractor from completing the Work within the Contract Time or excuse Contractor from paying liquidated damages if Final Completion is delayed.
 - b. After end of that period, request of substitution will be considered only in case of product unavailability or other conditions beyond the control of Contractor and at no additional cost to the Owner.
 - c. Product unavailability shall be verified in writing by manufacturer.
 6. If a request for substitution occurs after the identified period, the substitution may be reviewed at the discretion of the Engineer and the costs of such review, as approved by Owner, shall be borne by Contractor and will be deducted from the Contract Sum.
- B. Product Options:
1. Wherever more than one (1) manufacturer's name or product is specified, the first-named product is the basis for the design and the use of alternative named manufacturer's products or substitutes may require modifications in the project design and construction. Products of any other manufacturer, named or unnamed,

shall be considered as substitutions and submitted in accordance with the requirements for substitutions.

- a. For some products, manufacturers are listed under Part 2 in subsequent specification sections.
 - b. For some products, manufacturer's catalog model numbers and tradenames are listed under detailed product descriptions or on the Drawings.
 - c. If such alternatives are proposed by Contractor and are favorably reviewed by the Engineer, Contractor shall be responsible for all costs of any changes resulting from Contractor's proposed substitutions which affect other parts of the Work or the Work of separate Contractors, including the cost of the Engineer's additional services, testing, and permits thereby made necessary.
2. The Contract Documents do not purport that the specified product is a standard product of a named manufacturer, or that the named manufacturer's standard product is acceptable. Many products require special materials, construction, ratings, performance, testing, and controls and shall be considered one-of-a kind fabrications. Submit in accordance with the requirements for substitutions, any named product which deviates from specified materials, construction, ratings, listings, performance, controls, or other special features.
- C. Requests for substitutions will only be considered if the Contractor submits the following:
1. Complete technical data including drawings, specifications, samples, and test reports of the article proposed for substitution and any information required by the Engineer.
 2. Data described in Subparagraph D for the specified item for which substitution is proposed.
 3. Complete breakdown of costs, which shall include additional costs and savings generated by the proposed and shall indicate the amount to be deducted from the Contract Sum if the proposed substitution is accepted. Do not submit substitution requests if no savings is realized.
 4. Statement by the Contractor that the proposed substitution is in full compliance with the requirements of the Contract Documents and Applicable Code Requirement.
 5. List of other trades, if any, which may be affected by the substitution.
 6. If the proposed substitution requires that portions of the Project be redesigned or construction be removed to accommodate the substituted item, submit design and engineering calculations prepared by a properly licensed design professional. The Contractor shall bear all costs resulting from the substitution including any Work incurred by the Engineer to accommodate the substitution. Any such costs of the Engineer shall be approved prior to the Work involved by the Owner and the Contractor and shall be assessed as a Deductive Change Order.
 7. If tests for the determination of quality and utility are required by the Engineer, they shall be made by a testing laboratory, with acceptance of the test procedure first given by the Engineer, and at the expense of Contractor.
- D. Submit separate request for each substitution. Support each request with:

1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature; identify:
 - 1) Product description.
 - 2) Reference standards.
 - 3) Performance and test data
 - c. Samples, as applicable.
 - d. Name and address of similar projects on which the product has been used, and date of each installation.
 2. Itemized comparison of the proposed substitution with product specified; list significant variations.
 3. Data relating to changes in construction schedule.
 4. Any effect of substitution on separate contracts.
 5. List of changes required on other work or products.
 6. Accurate cost with product cost data comparing proposed substitution with specified.
 7. Designation of required license fees or royalties.
 8. Designation of availability of maintenance service sources of replacement materials.
- E. Substitutions will not be considered for acceptance and are invalid when:
1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor.
 2. They are requested directly by a Subcontractor or supplier.
 3. Acceptance will require substantial revision to Contract Documents.
 4. Insufficient information is submitted.
 5. To match existing as designated after a manufacturer or model number.
 6. The Engineer may reject any substitutions not proposed in the manner and within the time prescribed above.
 7. Failure of Contractor to submit proposed substitutions for approval in the manner described above and within the time prescribed shall be sufficient cause for disapproval by the Engineer of any substitutions otherwise proposed
- F. The Engineer may accept, in writing, proposed substitutions that are in the Engineer's opinion, equal in quality, utility, and appearance to the material or equipment specified, and result in an installation compliant with Owner Standards and result in a net contract savings after redesign and re-approvals.
- G. Such acceptance shall not relieve Contractor from complying with the requirements of the Drawings and Specifications.
- H. The Contractor shall be responsible that the substituted component fits the available space with no reduction in service access; that proper and correct piping and duct connections can be made; that adequate support and seismic bracing can be provided;

and that substituted equipment and the systems they are a part of function in accordance with the intent of the Sequence of Operation.

- I. Decision of the Engineer shall be final. If any proposed substitute is judged by the Engineer to be unacceptable, the specified item shall be provided. Further submissions will not be allowed unless directed by the Engineer.

1.05 CONTRACTOR'S REPRESENTATION

- A. In making a formal request for substitution, Contractor represents that: upon the Owner's approval of a Change Order Proposal Request, the Engineer will issue a Change Order for signatures of the Owner and Contractor as provided in the Conditions of the Contract.
 1. He has investigated and determined that it is equal to, or superior, in all respects to that specified.
 2. He will provide same warranties for the substitution as for the product specified.
 3. He will coordinate installation of accepted substitution into the Work and will make such changes as may be required for the Work to be complete in all respects.
 4. He waives claims for additional costs caused by substitution which may subsequently become apparent

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13 – PROJECT COORDINATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: requirements for project coordination and electrical and mechanical coordination of “tight” conditions involving work of the Project.

1.02 PROJECT COORDINATION

A. General

1. Coordinate the work; do not delegate responsibility for coordination to any subcontractor.
2. Anticipate the interrelationship of all subcontractors and their relationship with the total work.
3. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of work between sections. The Contractor’s decisions, if consistent with the Contract Documents, shall be final. The Engineer is not required to coordinate work between sections and will not do so.
4. Coordinate the work of subcontractors and material suppliers, so that their work is performed in a manner to minimize interference with, and to facilitate the progress of the work.
5. Be responsible for providing anchorage, blocking, joining and other detailing as required to provide complete project.
6. Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.
7. Do not cover any piping, wiring, ducts, etc., until properly inspected and approved and until proper certificates have been issued.
8. Remove and replace any and all work under any section which is not in accordance with the Contract Documents with other materials and work which is in conformance with the Contract Documents. Repair or replace all other work damaged by these operations at no increase in contract price.
9. Coordination with Other Contracts: Coordinate work of this Contract with other contracts and contractors as appropriate.
10. This work shall be coordinated with all associated work in a manner that will insure that all work will be accomplished as rapidly as the progress of the project will permit and so that no work will be delayed for want of associated work.

B. Electrical and Mechanical Coordination

1. Work out all “tight” conditions involving work of various sections in advance before installation. If necessary, and before work proceeds in these areas, prepare supplementary drawings for review showing all work in “tight” areas.
2. Provide supplementary drawings and additional work necessary to overcome “tight” conditions at no increase in contract price. Refer to Submittals Section 01 33 00.

3. Coordinated layout shop drawings shall be dimensionally accurate and detailed, giving complete dimensions of all locations, elevations, and clearances. Show exact locations of the following:
 - a. Piping
 - b. Mechanical layouts
 - c. Valves and piping specialties
 - d. Disconnect switches
4. Coordinated layout shop drawings shall show actual architectural and structural constraints and site conditions.
5. Coordination:
 - a. Fully coordinate work between trades with actual architectural, structural, and site conditions.
 - b. Coordinate all adjustments required. Clearly identify by circling these adjustments on the coordinated layout shop drawings.
 - c. If Contractor has specific questions regarding coordination of the installation with structural, architectural and site conditions and work between trades, submit same with appropriate shop drawings documenting areas in question with Contractor's proposed installation.
6. Submission and review of coordinated layout shop drawings:
 - a. Prepare reproducible drawings.
 - b. Submit to each trade for review of space allocated to all trades.
 - c. Revise drawings to compensate for review by each trade.
 - d. Review revisions with each trade.
 - e. Submit to Engineer for review.
 - f. Review of coordinated layout shop drawings is only for verification that Contractor has performed coordination work as specified herein.
Note: Review does not include verification of exact dimensions, clearances, arrangements and/or compliance with codes.
7. Final coordinated layout shop drawings shall show that all trades affected have made reviews and shall be signed by each trade at completion of coordination.
 - a. General Contractor is to assure that each trade has coordinated work with other trades.
 - b. Include stamp with labeled space for each trade to sign on each submittal indicating that layout shop drawing has been coordinated.
 - c. No layout shop drawing will be reviewed without stamped and signed coordination assurance by General Contractor.
8. Coordinated layout shop drawings showing work of all trades are required. Individual trade layout shop drawings will not be accepted.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19 – PROJECT MEETINGS

PART 1 GENERAL

1.01 PRECONSTRUCTION CONFERENCE

- A. A meeting will be scheduled by the City's Representative immediately prior to Contractor move-in. Representatives of the Contractor, Subcontractors, Engineer, City Building Inspector and appropriate utility representatives will be present as needed. Job site procedures and the following items will be discussed.
1. Contact information
 2. Responsibilities
 - a. Engineer
 - b. Construction Observer
 - c. Owner
 - d. Contractor
 - e. Any other agency contributing to the project
 3. General discussion of contract
 - a. Completion time
 - b. Partial payment procedures
 - c. Final acceptance
 - d. Other requirements of contract
 4. Contractor's schedule
 5. Sub-contracts
 6. Project observation
 7. Safety

1.02 PROGRESS MEETINGS

- A. A meeting will be conducted weekly, by the City's Project Manager and/or the Engineer for the purpose of coordinating the work. It is expected that the Contractor's Project Manager and the Contractor's Superintendent be in attendance.
- B. The meeting will be held in the job office or other designated location on a regularly scheduled basis. The date and hour will be announced by the City's Representative.
- C. Contractor is to provide at least a three-week (3-wk) look ahead schedule. This schedule shall be updated every two weeks. The Project Manager and Engineer shall review this schedule to identify any early scheduling changes and/or conflicts.
- D. Standard Site-Meeting Agenda
1. Job Status/Schedule
 - a. Construction schedule
 2. Status of Contractor Base Schedule submittal
 - a. Long-lead procurement items effecting schedule

- b. Owner-induced delays, if any
 - c. Contractor-caused delays, if any
 - d. RFIs - review responses effecting schedule
 - e. Shop drawing - review submittals and/or responses effecting schedule
 - f. Change Order items effecting schedule, if any.
3. Other Current Problem Areas/Resolutions
 4. Environmental/Safety Considerations
 5. Change Orders
- E. The essence of the discussion of each meeting will be entered into the minutes and copies will be furnished by the City's Project Manager or the Engineer to all interested parties within one week.

1.03 PROJECT CLOSE-OUT MEETING

- A. Approximately four (4) to six (6) weeks prior to the scheduled completion of the Project, for the convenience of the contractor, the City's Representative will include in the standard meeting agenda a Project Close-out meeting.
- B. The purpose is to produce an action-list of major items required to be completed prior to the issuance of the Notice of Completion.
 1. The action-list shall assign an action-responsibility and a projected action-completion date to each item.
 2. The contractor shall be solely responsible for the timely completion of all required close-out items.
 3. Items to be considered include:
 - Punch list
 - Removal of Temporary Facilities
 - Final Clean-up
 - Acceptance
 - Notice of Completion
 - Final Payment
 - Other close-out items

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes a description of the construction progress documentation required of the Contractor.

1.02 PROGRESS SCHEDULE

- A. Submit a detailed Progress Schedule that includes all work associated with the project from the initial Notice to Proceed to the Final Completion. This includes all phases of the work.
- B. Show the duration and sequencing of activities required for complete performance of the Work.
- C. The schedule must be approved by the Engineer and Updates to the schedule will be required monthly throughout the project to reflect actual progress and occurrences to date.
 - 1. Updates shall show work completed within no more than 5 working days prior to submission.
 - 2. Updates shall show at a minimum all approved changes, delays, modified sequencing, and progress projection changes.
- D. Detailed sub-schedules shall be available upon request of the City or Engineer to further define critical portions of the Work such as facility shutdowns.
- E. The schedule shall be presented in digital Bar Chart format from Microsoft Project or an approved equal program.

1.03 SCHEDULE SUBMITTAL AND CONTENTS

- A. Format:
 - 1. Submitted in 11 x 17 sheet size in paper format and electronically.
 - 2. Title block shall show the name of the project, owner, and date submitted.
 - 3. Timeline shall be identified horizontally across the top of the schedule; the timeline shall include the year, month, and day.
 - 4. Each activity shall have a unique number and bar associated.
 - 5. Each schedule shall include a legend describing all standard and special symbols used.
- B. Contents:
 - 1. The contents shall include, in a chronological timeline order, the activities reasonably required to complete the Work, including, but not limited to:
 - a. Submittals

- b. Mobilization
- c. Specific Work
- d. Completion Dates
- e. Subcontract Work
- f. Milestones
- g. Delivery Dates
- h. Demolition Work
- i. Concrete Work
- j. Mechanical Work
- k. Electrical Work
- l. Instrumentation and Controls Work
- m. Startup and Testing
- n. Closeout and Cleanup
- o. Demobilization

C. Acceptance of Schedules:

1. If a schedule is not accepted by the Engineer the schedule must be resubmitted within 10 days.
2. All submittal criteria must be present for the schedule to be accepted.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:
 - 1. Submittal schedule.
 - 2. Submittal procedures.
 - 3. Shop Drawings.
 - 4. Product Data.
 - 5. Samples
 - 6. Engineer's action.
- B. Refer General Conditions for requirements for administrative submittals. Such submittals include, but are not limited to:
 - 1. Permits.
 - 2. Applications for payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of Subcontractors.

1.02 SUBMITTAL PROCEDURES

- A. Requirements for Submittals described herein rely upon the use of hard copies. Use of equivalent electronic means is also acceptable. Engineer reserves the right to convert any hard copy submittal to electronic (pdf) format for return to Contractor.
- B. Coordination
 - 1. Coordinate preparation and processing of submittals with performance of construction activities.
 - 2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 3. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Engineer shall return without action any submittals requiring coordination with other submittals until related submittals are coordinated.
 - 4. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
 - a. See General Conditions for additional requirements.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.

- c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.
- C. Place a permanent label or title block on each submittal for identification.
1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 2. Include the following information on the label for processing and recording action taken:
 - a. Project name
 - b. Date
 - c. Name and address of Engineer
 - d. Name and address of Contractor
 - e. Name and address of subcontractor
 - f. Name and address of supplier
 - g. Name of manufacturer
 - h. Number and title of appropriate Specification Section
 - i. Drawing number and detail references, as appropriate.
- D. Submittal Transmittal
1. Package each submittal appropriately for transmittal and handling.
 2. Transmit each submittal from Contractor to Engineer using a transmittal form.
 - a. Record relevant information and requests for data.
 - b. Record deviations from Contract Document requirements, including minor variations and limitations.
 - c. Include Contractor's certification that information complies with Contract Document requirements.
 3. Submittals received from sources other than the Contractor will be returned without action.

1.03 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale.
- B. Highlight, encircle, or otherwise indicate deviations from the Contract Documents.
- C. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- D. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 1. Dimensions

2. Identification of products and materials included.
 3. Compliance with specified standards
 4. Notation of coordination requirements
 5. Notation of dimensions established by field measurement.
- E. Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 30" x 42".
- F. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.04 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as:
1. Manufacturer's installation instructions.
 2. Catalog cuts.
 3. Standard color charts.
 4. Roughing-in diagrams and templates.
 5. Standard wiring diagrams.
 6. Performance curves.
- B. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."
- C. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
1. Manufacturer's printed recommendations
 2. Compliance with recognized trade association standards
 3. Compliance with recognized testing agency standards
 4. Application of testing agency labels and seals
 5. Notation of dimensions verified by field measurement.
 6. Notation of coordination requirements
- D. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
- E. Submit a copy of each required submittal. The Engineer will return an electronic copy marked with action taken and corrections or modifications required.
- F. Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.
1. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.05 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include:
 1. Partial sections of manufactured or fabricated components
 2. Cuts or containers of materials
 3. Color range sets
 4. Swatches showing color, texture, and pattern.
- B. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to include the following:
 1. Generic description of the Sample
 2. Sample source
 3. Product name or name of manufacturer
 4. Compliance with recognized standards
 5. Availability and delivery time
- C. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
- D. Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
 1. Preliminary submittals will be reviewed and returned with the Engineer's mark indicating selection and other action.
- E. Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
- F. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
- G. Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.
- H. Field Samples specified in individual Sections are special types of Samples.
- I. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

1.06 ENGINEER'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly.
- B. Compliance with specified characteristics is the Contractor's responsibility.
- C. The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - 1. Final Unrestricted Release: Where submittals are marked "No Exceptions Taken," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - 2. Final-But-Restricted Release: When submittals are marked "Make Changes Noted, See Comments," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections provided and requirements of the Contract Documents; final acceptance will depend on that compliance.
 - 3. Returned for Resubmittal: When submittal is marked either "Revise & Resubmit, See Comments" or "Rejected", do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Revise & Resubmit, See Comments" or "Rejected" to be used at the Project site, or elsewhere where Work is in progress.
 - b. Note: Any work performed prior to receiving a "No Exceptions Taken" response to the submittal shall be done at the Contractor's own risk.
- D. The Contractor shall be allowed a maximum of two resubmittals for any part of the work where resubmittal is required.
 - 1. In the event that the Contractor's submittal for a part of the work is returned for resubmittal more than two times, the Contractor shall bear the cost for the Engineer's review of any and all subsequent review of resubmittals for that part of the work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 01 – SUBMITTAL LIST

PART 1 GENERAL

1.01 SUMMARY

- A. Shop Drawings, Product Data, Calculations, and Samples shall be submitted by the Contractor for review by the Engineer prior to delivery to the job site. Materials and services requiring submittals shall include but not be limited to the following:
1. Installer certifications including from the coatings manufacturer for application of submitted coatings
 2. Grouts
 3. Epoxy anchors
 4. Structural metal items
 5. Fabricated metal items
 6. Guardrail
 7. Hand hole covers
 8. Welding plans and certifications
 9. Coatings plan
 10. Ventilation and containment plan
 11. Abrasive blast media
 12. Safety and health plans
 13. Pipe and piping appurtenances
 14. Valves and operators (all types)
 15. Sampling Station
 16. Internal tank ladder
 17. Level indicator
 18. Roof vents
 19. Electrical equipment
 - a. Anchor/mounting details for all equipment
 - b. Circuit breakers
 - c. Conduit, wire, cable, junctions
 - d. Pull boxes, junction boxes
 - e. Receptacles and switches
 - f. Wiring diagrams
 - g. Terminating kits, lugs, and connectors for all conductors (Power, Control, and Indication)
 - h. Intrusion switches
 - i. Cabinets
 - j. Lighting and mounting hardware
 20. Testing procedures and testing results
 21. Antenna system

City of Petaluma
Hardin Tank Improvements

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 13 – SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes requirements for the following:
 - 1. Dust and Air Pollution Control
 - 2. Water from Cleaning Tank
 - 3. Disposal Operations
 - 4. Access
 - 5. Security

1.02 DUST AND AIR POLLUTION CONTROL

- A. Employ measures to avoid the creation of dust and air pollution.
 - 1. Limit equipment speed to 10 miles per hour in unpaved areas.
 - 2. Unpaved areas shall be wetted down, to eliminate dust formation, a minimum of twice a day to reduce particulate matter. When wind velocity exceeds 15 mph, site shall be watered down more frequently.
 - 3. Store all volatile liquids, including fuels or solvents in closed containers.
 - 4. No open burning of debris, lumber or other scrap will be permitted.
 - 5. Maintain equipment in good mechanical condition.
- B. Limit dust emissions during periods of high winds (greater than 15 miles per hour).
- C. Abrasive Blasting
 - 1. All dust, removed coatings and abrasive blast media, shall be completely contained with no fugitive emissions per Bay Area Air Quality requirements and per SSPC Guide 6 Class 1A standards.
 - 2. No dry abrasive blasting will be allowed without SSPC Guide 6 Class 1A containment.
 - 3. Wet abrasive blasting (SSPC SP6 WAB) may be approved with approved liquid containment and using recycled water. City recycled water is available for pick up by the contractor at no cost to the contractor.
 - 4. Self-contained wheel blast cleaning using recycled shot will be allowed with approved sealed debris containment and vacuum handling systems. See SSPC Guide 6, Section 5.1.9.2.
- D. Coating Operations
 - 1. Contractor to cover pavement and concrete around the tank and all City equipment on site to prevent unintentional coating or depositing of dry fall.
 - 2. No coating of tank exterior shall be done when wind is above 10 mph.

1.03 DISPOSAL OPERATIONS

- A. Solid Waste Management: supply solid waste transfer containers. Remove all debris such as spent air filters, oil cartridges, cans, bottles, combustibles, and litter. Take care to prevent trash and papers from blowing onto adjacent property. Encourage personnel to use refuse containers. Convey contents to a sanitary landfill.
- B. Washing of containers where wastewater may reach adjacent property, storm drains or natural water courses will not be permitted. Remove any excess concrete to the sanitary landfill.
- C. Chemical Waste and Hazardous Materials Management: furnish containers for storage of spent chemicals used during construction operations. Dispose of chemicals and hazardous materials in accordance with applicable regulations.
- D. Garbage: store garbage in covered containers, pick up daily and dispose of in a sanitary landfill.
- E. Dispose of vegetation, weeds, rubble, and other materials removed by the clearing, stripping and grubbing operations off site at a suitable disposal site in accordance with applicable regulations.
- F. Water from Cleaning Tank
 - 1. Contractor is responsible to collect and dispose off site all water from cleaning tanks.
 - a. Disposal shall be in compliance with all applicable water quality regulations.
 - 2. Contractor shall submit to the Construction Observer a Plan for collecting and disposing tank wash water. Contractor shall not wash tank until the plan has been accepted in writing.
 - 3. For disposal to the City of Petaluma Water Recycling Facility, the Contractor shall make a written request to the City.
 - a. The Contractor shall obtain a Wastewater Discharge Permit for the City.
 - b. The request shall include the approximate quantity to be disposed on a daily basis.
 - c. The request shall include a list of chemicals used in cleaning the tank or otherwise introduced to the water, including MSDS for each.
 - d. Upon favorable review of the request, the City will direct the Contractor as to which manhole(s) may be used for disposal.
- G. Removed Coatings & Spent Abrasives:
 - 1. Handling and disposal of removed coating and spent abrasive materials shall comply with the requirements of Section 09 97 14 Steel Tank Coating.
- H. Rubbish shall consist of all materials not classified as suitable materials or rubble and shall include shrubbery, trees, timber, trash and garbage.

1.04 ACCESS

- A. The water tank is within a fenced and locked area. Arrangements for Contractor access will be made at the Pre-Construction meeting.

1.05 SECURITY

- A. The areas where the tank improvements work will be performed are located within locked and fenced areas. The sites are accessible from public or private roads. The Contractor will be allowed to store items within the fenced areas, but the City will NOT assume liability for theft, damage or injury, which are the sole responsibility of the Contractor.

1.06 ELECTRICAL POWER

- A. Contractor shall be responsible for providing power for all construction needs, including tank dehumidification.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 54 50 – SAFETY AND HEALTH

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Confined Space Entry
- B. General Safety

1.02 SUBMITTALS

- A. Accident Reporting: A copy of each accident report, which the Contractor or Subcontractors submit to their insurance carriers, shall be forwarded to the Construction Observer as soon as possible, but in no event later than seven (7) calendar days after the day the accident occurred.
- B. Other Submittals: If agreed to in writing at the preconstruction safety meeting, other submittals shall be required. One such submittal that may be included is a plan of action for handling removed coatings and spent abrasive materials to contain the following:
 - 1. Number, type, and experience of employees to be used for the Work.
 - 2. Description of how safety and health regulations and standards shall be met.
 - 3. Type of protective equipment and work procedures to be used.
 - 4. Emergency procedures for accidental spills or exposures.

1.03 WORK IN AND AROUND TANKS

- A. Confined spaces are defined by Title 8 Section 5157 of the California Code of Regulations. Conform to confined space entry requirements.
- B. Provide head and face protection equipment and respiratory devices required to safely perform this work. Include applicable masks and air supply recommended by the manufacturer while performing blasting or application of the coating materials.
- C. Provide and require the use of approved ear protection devices by personnel working in the areas of excess noise whenever the occupational noise exposure exceeds maximum allowable sound levels as specified by Cal OSHA requirements.
- D. Include necessary worker and environmental protective methods and procedures for removal of coatings containing toxic metals, if present, and asbestos (if present) in conformance with applicable regulation, SSPC-6 guidelines, and the contract documents.
- E. Temporary ladders and scaffolding shall conform to applicable safety requirements. Erect ladders and scaffolding where requested by the Inspector to facilitate inspection.
- F. Failure to comply with health and safety laws, regulations, codes, permits and Standard Operation Procedures will be grounds for shutting down the Work. Costs resulting due to a shutdown of the Work that are due to the Contractor's negligence or failure to

comply with applicable safety requirements shall be borne by the Contractor. After a shutdown of the Work, the Work will not be permitted to begin again until the Engineer is satisfied that all necessary health and safety precautions are being taken.

G. Flammable, volatile solvents in coating system components constitute a major hazard with regard to fire and explosions wherever flame or spark exposure is possible. Flames, smoking, and welding, etc., are strictly prohibited in work or storage areas. Fire abatement devices shall be readily available and in operating condition. Necessary precautions shall be taken to keep fire hazard to a minimum; all oily rags, waste and other combustibles not in covered containers shall be removed from the area daily. Coatings, solvents, thinners and related products shall be stored in conformance with applicable State, County and/or Local Fire Codes pertaining to flammable materials.

H. Tank Interior:

1. Provide sufficient ventilation to keep solvent concentrations below the lower explosive limit. The blower capacity required to maintain vapor concentration below the lower explosive limit will be determined by the Contractor. Blowers will be suction type. Maintain ventilation during the entire application period and for at least 48 hours thereafter.
2. Use of approved supplied air masks by workers in tanks and closely confined areas during the blast and cleanup operation is required. During the coating operation, use approved respiratory filters and masks. Provide one spare mask and respiratory filter readily available for use by the Construction Observer or Inspector. Mask manufacturers include the DeVilbiss Company, Toledo, Ohio and Mine Safety Appliances Co., Pittsburgh, Pennsylvania.
3. Remove the solvent vapors from the tank by suction. Do not force air from the outside into the tank. The solvents in paint products are heavier than air and therefore tend to settle in the lowest part of the tank. In setting up the ventilation system, the most remote and the lowest areas should receive special attention. Continue ventilation until solvent vapors have been completely removed and the paint has completely cured.
4. Use explosion proof and spark-proof equipment. Electric cable, motors and lighting equipment must be of an approved explosion-proof type. No electric junction boxes should be permitted inside the tank. Drop lights used by the workmen must also be explosion proof. Workmen should be cautioned not to cut or stretch electric cables since sparks will result if the cable parts. Within the hazardous area all metal equipment and hand tools must be of a non-sparking type and workmen's shoes must have rubber soles and heels. All blast and spray equipment must be properly grounded.
5. Prohibit smoking, matches, flames or sparks of any kind.

I. Sound Level

1. Whenever occupational noise exposure exceeds maximum allowable sound levels, Contractor shall provide and require the use of approved ear protection devices.
2. Equipment shall be placed in locations or muffled in order to reduce exterior noise with respect to nearby residents. Noise shall not exceed 76 decibels at 10 feet from any of the generator, dehumidifier, compressors, and/or any other equipment. At the

request of the Engineer, and in the presence of the Engineer, Contractor shall measure the noise level at 10 feet from any operating equipment, using a noise measuring instrument accepted by the Engineer.

J. Illumination

1. Adequate illumination shall be provided while work is in progress, including explosion-proof lights and electrical equipment.
2. Whenever required by the Engineer, Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected.

PART 2 PRODUCTS

2.01 GENERAL

- A. Special facilities, devices, equipment, clothing, and similar items used by the Contractor in the execution of the Work shall comply with the applicable regulations.

2.02 HAZARDOUS MATERIALS

- A. The Contractor shall bring to the attention of the Construction Observer or Engineer, any material suspected of being hazardous which he encounters during execution of the Work. The Inspector shall perform tests to determine if the material is hazardous. If the material is found hazardous and additional protective measures are needed, a Contract Change Order may be required, subject to the requirements of the General Conditions.

PART 3 EXECUTION

3.01 STOP WORK ORDERS

- A. When the Contractor or its Subcontractors are notified by the Construction Manager of any noncompliance with the provisions of the Contract, and the action(s) to be taken, the Contractor shall immediately, if so directed, or within 48 hours after receipt of a notice of violation correct the unsafe or unhealthy condition. If the Contractor fails to comply promptly, all or any part of the work being performed may be stopped by the Inspector with a "Stop Work Order." When, in the opinion of the Inspector, satisfactory corrective action has been taken to correct the unsafe and unhealthy condition, a start order will be given immediately. The Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppage.

END OF SECTION

SECTION 01 70 00 – PROJECT CLOSE-OUT

PART 1 GENERAL

1.01 SUMMARY

- A. Section specifies administrative and procedural requirements for project close-out, including but not limited to the following:
 - 1. Punchlist inspection procedures
 - 2. Spare parts/materials
 - 3. Submittal of warranties
 - 4. Submittal of permits and regulatory inspection reports
 - 5. Operations and maintenance manuals
 - 6. Commissioning/equipment testing and startup
 - 7. Record Documents Submittals
 - 8. Close-out procedures and final completion

1.02 PUNCH-LIST INSPECTION

- A. When each portion of the Work is, in the opinion of the Contractor, complete in all respects, the Contractor shall call for a punch-list inspection.
- B. Inspection Procedures: On receipt of a request for inspection, the Engineer will schedule the Inspection. The Engineer will then perform a preliminary, walk-through. If, in the judgment of the Engineer, the project is not sufficiently complete in all respects, the Engineer will so advise the Contractor and discontinue the inspection.
 - 1. The Engineer will repeat inspection when requested and assured that the work has been completed.
 - 2. Results of the completed inspection will form the basis of requirements for final acceptance punch-list.

1.03 SPARE PARTS/MATERIALS

- A. Submit all required spare parts and material required by the Contract Documents.

1.04 SUBMITTAL OF WARRANTIES

- A. Submit all equipment and material warranties required by the Contract Documents.

1.05 PERMITS AND REGULATORY INSPECTION REPORTS

- A. Submit a copy of each permit obtained for the project with all associated information including, but not limited to permit application forms, inspection reports, regulatory authorizations, Notice of Intent, and notice of completions.

1.06 OPERATIONS AND MAINTENANCE MANUALS

- A. Submit three (3) sets to the Engineer for review and approval.

1.07 COMMISSIONING/EQUIPMENT TESTING AND STARTUP

- A. Conduct all required equipment testing and startup to the satisfaction of the Owner and provide all testing and startup reports and forms.

1.08 RECORD DOCUMENTS SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire resistive location, provide access to documents for the Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of black line, white prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions full and accurately; where Shop Drawings are used, record a cross reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - 1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
 - 2. Mark new information that is important to the Engineer, but was not shown on Contract Drawings or Shop Drawings.
 - 3. Note related Change Order numbers where applicable.
 - 4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets and print suitable titles, dates, contact information and other identification on the cover of each set.
 - 5. Upon completion of the work, submit Record Drawings to the Engineer for further processing.
- C. Record Specifications: Maintain one complete copy of the Project Specifications, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications. Give particular attention to substitutions, deviations, selection of options and similar information on elements that are buried, concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product data. Upon completion of the work, submit record Specifications to the Engineer for further processing.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CLOSE-OUT PROCEDURES – CLOSEOUT MEETING

- A. The Engineer will call for a “Close-out” meeting approximately two to four weeks prior to the anticipated completion date.
 - 1. At this meeting a completion Action List will be prepared listing all major items required to be completed prior to the issuance of the Notice of Completion.
 - 2. The action-list shall assign an action-responsibility and a projected action-completion date to **each** item.
 - 3. The contractor shall be solely responsible for the timely completion of all required close-out items.

3.02 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for certification of acceptance of final completion submit a certified copy of the Engineer’s final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Engineer.
- B. Re-inspection Procedure: The Engineer will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections (punch-list), has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner.
 - 1. Upon completion of re-inspection, the Engineer will prepare and submit to the Owner, a recommendation of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final completion.
- C. See additional requirements for final completion in the General Conditions.

END OF SECTION

SECTION 01 74 10 – CLEANING

PART 1 GENERAL

1.01 SUMMARY

- A. Work covered by this Section includes furnishing all labor, materials, equipment, tools, and incidentals and performing all operations to conduct clean-up activities and responsibilities during construction and prior to final acceptance.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL PROCEDURES

- A. The construction area shall be kept free of rubbish, waste materials, and packing materials. All waste materials shall be disposed of as soon as possible.
- B. Easements, right-of-way and temporary access routes shall be kept free of all waste materials, unused pipe, excessive dirt and dust. Cleanup shall closely follow pipe laying and backfilling. Fences shall be protected during construction and repaired to the City's satisfaction immediately following site and underground construction. All large rocks, clods, broken pipe and unused materials shall be removed from the work site during construction and during final cleanup.
- C. The construction area shall be cleaned immediately after welding or blasting.
- D. All structures shall be completely cleaned prior to final acceptance. All painted surfaces, including all piping and equipment shall be cleaned of all dirt, oil, smudges, etc.
- E. Final cleanup shall include the removal and disposal of all foreign material, paint and paint chips, paper, rubbish, rocks, clods, excess pipe, asphalt, wood, metal, and all other excess miscellaneous construction material.
- F. All asphalt pavement and concrete structures shall be washed with water and swept clean.
- G. Repair any damage caused by construction activities to pavement, concrete structures or other appurtenances on the site.

3.02 SITE RESTORATION / CLEANUP

- A. Remove all staging, scaffolding, abrasives, containers, etc., from the work site in a manner approved by the Engineer upon completion of the work. Dispose abrasive blast residue in a manner consistent with guidelines set forth by the U S Environmental Protection Agency (US-EPA) or California Environmental Protection Agency (Cal/EPA)

- B. Remove and dispose of materials classified as hazardous Class 1 Landfill, or in a manner consistent with standards and guidelines set forth by the above-named agencies, or as directed by the Engineer.
- C. Protect the public from hazardous materials found at the site. Remove and dispose of hazardous materials in accordance with all local, State, and Federal agencies' rules, regulations, laws, or ordinances, in existence at the time of the work.
- D. Remove coating, paint spots and/or oil stains upon adjacent surfaces and clean the job site. Damage to surfaces and/or landscaping resulting from work in this section shall be cleaned, repaired, or refinished to the satisfaction of the Engineer, at no cost to the City.

END OF SECTION

SECTION 03 60 00 - GROUTS

PART 1 GENERAL

1.01 SUMMARY

- A. The work covered in this section includes grout associated with the construction of the following:
1. Concrete mortar.
 2. Grout.
 3. Dry-pack mortar.
 4. Non-shrink grout.
 5. Epoxy grout.
 6. Non-shrink epoxy grout.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. C 109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2 inch or 50 millimeter cube specimens).
 2. C 230 - Standard Specification For Flow Table For Use In Tests Of Hydraulic Cement
 3. C 531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 4. C 579 - Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacing.
 5. C 827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 6. C 939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
 7. C 1090 - Test Method for Measuring Change in Height of Cylindrical Specimens from Hydraulic-Cement Grout.
 8. C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).
 9. C 1181 - Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts.

1.03 SUBMITTALS

- A. Non-Shrink Grout: Submit manufacturers literature and certified test data prior to installation.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be delivered to the jobsite in their original, unopened packages or containers, clearly labeled with the manufacturer's product identification and printed instructions.
 - 1. All materials shall be stored in a cool dry place and in accordance with the manufacturer's recommendations.
- B. All materials shall be handled in accordance with the manufacturer's instructions.

1.05 PROJECT/SITE CONDITIONS

- A. Refer to manufacturer's literature or contact the manufacturer for any special physical or environmental limitations that may be required for use of products.

1.06 WARRANTIES

- A. Non-Shrink Grout: The manufacturer shall warranty that the non-shrink grout will never go below its initial placement volume when tested in accordance with ASTM 01107.
- B. Non-Shrink Epoxy Grout: The manufacturer shall warranty that non-shrink epoxy grout will show negligible shrinkage or expansion when tested in accordance with ASTM C531.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Concrete Mortar:
 - 1. General: Consist of concrete mixture with coarse aggregate removed and water quantity adjusted as required.
 - 2. At Exposed Concrete Surfaces Not to Be Painted or Submerged in Water: White cement.
- B. Grout:
 - 1. Consist of mixture of Portland cement and sand.
- C. Dry-Pack Mortar:
 - 1. Consist of mixture of Portland cement and sand.
- D. Non-Shrink Grout:
 - 1. Manufacturers: One of the following or equal:
 - a. Five Star Products, Inc., Fairfield, CT, Five Star Fluid Grout 100.
 - b. BASF Building Systems, Shakopee, MN, Masterflow 928.
 - 2. Non-shrink grout shall be a pre-portioned and prepackaged cement-based mixture. It shall contain no metallic particles such as aluminum powder and no metallic aggregate such as iron filings. It shall require only the addition of potable water.

3. Potable water for pre-soaking, mixing, and curing shall be clean and free of oils, acids, alkalis, organics, and any other deleterious matter.
 4. Bleeding: Non-shrink grout shall be free from the emergence of mixing water from within or the presence of water on its surface.
 5. Non-shrink grout shall be in accordance with ASTM C 1 107.
 6. Consistency: Non-shrink grout shall 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 C 230. If at a fluid consistency, it shall be verified in accordance with ASTM C 939.
 7. Dimensional Stability (height change): Non-shrink grout shall be in accordance with ASTM C 1107, volume-adjusting Grade B or C at 45 degrees to 90 degrees. It shall show 90 percent or greater bearing area under bases or baseplates.
 8. Compressive Strength: Non-shrink grout shall show minimum compressive strengths at 45 degrees Fahrenheit to 90 degrees Fahrenheit in accordance with ASTM C 1107 for various periods from the time of placement, including 5,000 pounds per square inch at 28 days when tested in accordance with ASTM C 109 as modified by C 1107.
- E. Epoxy Grout:
1. Consist of mixture of epoxy and sand.
 2. Sand: Clean, bagged, graded, and kiln dried silica sand.
- F. Non-Shrink Epoxy Grout:
1. Manufacturers: One of the following or equal:
 - a. Five Star Products, Inc., Fairfield, CT, Five Star Epoxy Grout.
 - b. Master Builders, Inc., Cleveland, OH, Masterflow 648 CP Plus.
 - c. L&M Construction Chemicals, Inc., EPOGROUT.
 2. Non-shrink epoxy grout shall be a 100 percent solids, premeasured, prepackaged system containing a two-component thermosetting epoxy resin and inert aggregate.
 3. Consistency: Non-shrink epoxy grout shall maintain a flowable consistency for at least 45 minutes at 70 degrees Fahrenheit.
 4. Dimensional Stability (height change):
 - a. Non-shrink epoxy grout shall have negligible shrinkage or expansion (less than 0.0006 in/in) when tested in accordance with ASTM C 531.
 5. Compressive Strength: Non-shrink epoxy grout shall show a minimum compressive strength of 1 0,000 pounds per square inch at 24 hours and 14,000 pounds per square inch at 7 days when tested in accordance with ASTM C 579, Method B.
 6. Compressive Creep: The compressive creep for non-shrink epoxy grout shall not exceed 0.0027 in/in when tested under a 400 pounds per square inch constant load at 140 degrees Fahrenheit in accordance with ASTM C 1181
 7. Thermal Capability: The coefficient of thermal expansion for non-shrink epoxy grout shall not exceed 0.000018 inches per inch per degree Fahrenheit when tested under ASTM C 531, Method B.

2.02 MIXES

- A. Concrete Mortar Mix:
 - 1. Use water-cement ratio that is no more than that specified for concrete being repaired.
 - 2. 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.

- B. Grout Mix:
 - 1. For Concrete Repair: Mix in same proportions used for concrete being repaired, with only sufficient water to give required consistency for spreading.
 - 2. For Spreading over the Surfaces of Construction or Cold Joints: Mix with no more water used than allowed by water-cement ratio specified for concrete.
 - 3. For Other Applications: Mix in proportions by weight of one part cement to four parts of concrete sand.

- C. Dry-Pack Mortar Mix: Use only enough water so that resulting mortar will crumble to touch after being formed into ball by hand.
 - 1. Non-Shrink Grout: Mix in accordance with manufacturers installation instructions such that resulting mix has fluid or flowable consistency and is suitable for placing by pouring.

- D. Epoxy Grout:
 - 1. Mix in accordance with manufacturer's installation instructions for mixing.
 - 2. Proportioning:
 - a. For horizontal work, consist of mixture of one part epoxy as specified in Section 03071 with not more than 2 parts sand.
 - b. For vertical or overhead work, consist of 1 part epoxy gel as specified in Section 03071 with not more than 2 parts sand.

- E. Non-Shrink Epoxy Grout: Mix in accordance with manufacturer's installation instructions.

PART 3 EXECUTION

3.01 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 affect the bond or performance of grout or mortar.

- B. Inspect baseplate and anchor systems for rust, oil, and other deleterious substances that may affect the bond or performance of grout.

- C. Confirm that newly placed concrete has been cured sufficiently to attain its design strength and limit further shrinkage.

- D. Verify that temperature of cementitious grout does not exceed manufacturer's recommendations.

3.02 PREPARATION

A. Surface Preparation:

1. Roughen all concrete surfaces by heavy sandblasting, chipping, or other mechanical means to assure bond. Loose or broken concrete shall be removed.
2. All grease, oil, dirt, curing compounds, laitance, and other deleterious materials that may affect bond that were identified in the inspection process shall be completely removed from concrete and bottoms of baseplates.
3. For cementitious mortars and grouts, concrete surfaces shall be saturated surface dry. Any standing water shall be removed prior to placing grouts.

B. Forms and Headboxes for Grouts (Cementitious):

1. Forms for grouts shall be built of material with adequate strength to withstand the placement of grouts.
2. Forms must be rigid and liquid tight. All cracks and joints shall be caulked with an elastomeric sealant. All forms shall be lined with polyethylene for easy grout release. Forms carefully waxed with two coats of heavy-duty paste wax shall also be acceptable.
3. Forms shall be 4 to 6 inches higher than the baseplate on one side of the baseplate configuration when using head pressure for placement.
4. A sufficient number of headboxes shall be built to facilitate placement of grouts.
5. Air relief holes a minimum 1/8 inch in diameter shall be provided when required by a baseplate configuration to avoid entrapping air underneath.

3.03 APPLICATION

A. Cement Mortar and Grout:

1. For Defective Concrete Repair:
 - a. Filling: Filling of voids around items through the concrete.
 - b. Grout Spreading: Spread over construction joints, cold joints, and similar type items.
2. Concrete Surfaces:
 - a. Apply epoxy bonding agent to clean, roughened, and dry surfaces before placing mortar or grout.
3. Placing:
 - a. Exercise particular care in placing Portland cement mortar or grout since they are required to furnish structural strength or impermeable water seal or both.
 - b. Do not use cement mortar or grout that has not been placed within 30 minutes after mixing.

B. Epoxy Grout:

1. Apply in accordance with manufacturer's installation instructions.
2. Use where specified herein or where indicated on the Drawings.

3.04 PLACEMENT

- A. The CONTRACTOR shall make arrangements to have a grout manufacturer's representative present for a preconstruction meeting and during initial grout placement. Grout shall only be installed after the final equipment alignment is correct and accepted by the ENGINEER.
1. Grouts shall be mixed in accordance with the manufacturer's recommendations.
 2. A mortar mixer with moving paddles shall be used for mixing grouts. For cementitious grouts, pre-wet the mixer and empty out excess water before beginning mixing.
 3. Cementitious Grouts:
 - a. Non-shrink cementitious grout shall be added to a premeasured amount of water that does not exceed the manufacturer's maximum recommended water content.
 - b. Mix cementitious grouts per manufacturer's instructions for uniform consistency.
 - c. Grouts may be dry packed, flowed, or pumped into place. All baseplate grouting shall take place from one side of a baseplate to the other to avoid trapping air. Do not overwork grouts.
 - d. Do not retemper grout by adding more water after stiffening.
 - e. 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 to top of baseplate.
 4. Epoxy Grouts:
 - a. Epoxy grouts shall be mixed in complete units. Do not vary the ratio of components or add solvent to change the consistency of the mix.
 - b. Pour the hardener into the resin and mix for at least one minute and until each mixture is uniform in color. Pour the chemical components into the mortar mixer wheelbarrow and add the aggregate. Mix until aggregate is uniformly wetted. Overmixing will cause air entrapment in the mix.
 - c. All epoxy grouts shall be flowed into place using a headbox. All grouting shall take place from one side of a baseplate to the other in a continuous flow to avoid trapping air.
 - d. Hydrostatic head pressure shall be maintained by keeping the level of grout in headboxes above the bottom of baseplates. Headboxes shall be filled to the maximum level and grout worked down to the bottom of baseplates.
 - e. Epoxy grouts shall not be cut back after setting. The final level of grout will be as installed with all chamfer edges built into the formwork.

3.05 CURING

- A. Cementitious Grouts:
1. Grouts must be cut back to the lower edge of baseplates after reaching initial set. Provide a 45-degree angle cut back.
 2. Clean equipment and tools as recommended by the grout manufacturer.
 3. Cure grouts in accordance with manufacturer's specifications and recommendations. Keep grout moist for a minimum of 3 days. The method needed to protect grouts

will depend on temperature, humidity, and wind. Wet burlap, a soaker hose, sun shading, ponding and, in extreme conditions, a combination of methods shall be employed.

4. Grouts shall be maintained above 40 degrees Fahrenheit until they have 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.
- B. Epoxy Grouts:
1. Cure grouts in accordance with manufacturers' specifications and recommendations. Do not wet cure epoxy grouts.
 2. Consult the manufacturer for appropriate cure schedule. In no case should any surface in contact with grout be allowed to fall below 50 degrees Fahrenheit for a minimum of 48 hours after placement.
 3. Equipment and tools shall be cleaned immediately with a strong liquid detergent and water solution before grout hardens.

3.06 FIELD QUALITY CONTROL

- A. Non-shrink cementitious grouts shall be tested for 24-hour compressive strength in accordance with ASTM C 109.
- B. Non-shrink grouts shall be tested for 24-hour compressive strength in accordance with ASTM C 579 (Method B).

END OF SECTION

SECTION 05 05 23 - MISCELLANEOUS METALS

PART 1 GENERAL

1.01 DESCRIPTION

- A. The Work includes, but is not necessarily limited to, the furnishing and installing of miscellaneous metals, guardrails, fasteners, and galvanized finishes for exterior items, as indicated on the Drawings and specified herein.

1.02 QUALITY CONTROL

- A. Codes and standards: Comply with the provisions of the following codes, standards, and specifications, except as otherwise shown and specified.
1. AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Building", including "Commentary on the AISC Specification."
 2. AISC "Specification for the Design of Cold-formed Steel Structural Members."
 3. AWS "Code for Welding in Building Construction."
 4. ASTM A6 "General Requirements for Delivery of Rolled-Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."
 5. AWWA D100.
- B. Welding procedures, welders, welding operation, and tackers shall be qualified in accordance with the AWS "Code for Welding in Building Construction", D1.0.
1. Comply with AWS publication, "Welded Zinc Coated Steel" for galvanized products.
 2. Verify exact dimensions by field measurements.
 3. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Contractor shall comply with general requirements for materials, design, shop fabrication, erection, welding, testing and accessories of the AWWA Standards for Welded Carbon Steel Tanks for Water Storage, Designation AWWA D100.
- D. Welding inspections shall be under the direction of the City, and, as they require, by inspectors representing the City of Petaluma.

1.03 SUBMITTAL

- A. Procedures: In accordance with Section 01 33 00.
- B. Shop Drawings: Submit large-scale drawings for the fabrication and erection of all assemblies, which are not completely shown on the Drawings.

1. Include plans and elevations; include details of sections and connections; and show anchorage and accessory items.
 2. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices.
 3. All welds, both shop and field, shall be indicated by AWS "Welding Symbols."
 4. Welding procedures.
 5. Hardware cut sheets.
- C. Product Data: Manufacturer's specifications, load tables, dimensions, diagrams, anchor details, and installation instructions for products to be used in the fabrication of Work, including paint products.
- D. Reports certifying that welding procedures, welder and welding operators are qualified, prior to any construction.
- E. Welding procedures for review prior to start of welding.
- F. Copies of test results for Procedure and Welder Certification properly certified in accordance with Section 8 of AWWA Standard D100.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Standard structural steel shapes, bars and plates: ASTM A36.
- B. Steel plate to be bent or cold formed: ASTM A283, Grade C.
- C. Cold-drawn steel tubing: ASTM A500.
- D. Typical unfinished bolts, nuts, eyebolts and washers: Low carbon steel standard fasteners, externally and internally threaded, ASTM A-307; malleable washers.
- E. Expansion Bolts:
1. Reverse cone, self-wedging, expansion type made by HILTI Kwik-Bolt, or approved equal. Tightening of nut or increased tension on bolt shank shall act to force wedges outward to create positive increased resistance to withdrawal. All expansion bolts shall be drill-in type, sizes as recommended by the item manufacturer.
- F. Welding Electrodes: In accordance with AWS D1.1.
- G. Primer: FS TT-P-645 (Zinc-chromate) or TT-P-86 Type I (alkyd type), <200 V.O.C. Primer shall be compatible with finish paint requirements.

- H. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, complying with DOD-P-21035A.
- I. Zinc for Galvanizing: ASTM B6.
- J. Non-metallic, shrinkage-resistant grout: Pre-mixed non-metallic, non-corrosive product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CRD C-621 Grades B or C.

2.02 FABRICATION

A. Preparation:

1. Coordinate with other Work supporting or adjoining metal fabrications and verify requirements for cutting out, fitting, and attaching.
2. Verify sizes, designs, and location of items.

B. General Requirements:

1. Materials, sizes, connections, fasteners, and anchors shall be shown or specified. When materials, sizes, connections, fasteners, and anchors are not shown or specified they shall be of good commercial quality, suitable in all respects for the intended purpose and in accordance with established professional standards.
2. Miter corners and angles of frames unless otherwise shown or specified.
3. Perform cutting, shearing, drilling, punching, threading, tapping as required.
4. Drill or punch holes; do not use cutting torch.
5. Remove burrs resulting from cutting or punching.
6. Insure shearing and punching leaves true lines and surfaces.
7. Items to be galvanized: Items which will be exposed to weather in the completed work or as shown, using hot-dip process after fabrication.
8. Fabricate exterior items for assembly and installation on site without field-welding of joint.
9. Insure metal thickness and assembly details provide ample strength and stiffness.
10. Size sleeves for approximately 1/4-inch clearance all around.

C. Fastening:

1. Provide fasteners and anchor assemblies required for complete fabrication, field assembly, and erection.
2. Size internally threaded diameters to accommodate threaded bolts where galvanizing is required.
3. Weld permanent connection in ferrous metal items wherever practicable; avoid bolts and screws.

D. Welding:

1. Use electric shield-arc process according to AWS D1.1.
2. Maintain shape and profile of welded item.
3. Prevent heat blisters, run-through, and surface distortions.

E. Bolted and Screwed Connection:

1. Use bolts for field connections only, and then only as specified. Countersink heads; finish smooth and flush, where appropriate.
2. Where necessary to use screws for permanent connections in ferrous metal, use flat-head type, countersink, fill screw slots, and finish smooth and flush.

2.03 FABRICATED ITEMS

A. Roof Guardrail

1. Guardrails shall be installed on the full perimeter of the tank roof and comply with all Cal OSHA safety regulations.
2. Rails: 3 each horizontal rails, equal spaced vertically, of 1-1/4-inch standard weight steel pipe, shall be rolled to match the required radius with all welded assembly. Top rail shall be 3-foot 6-inches above the top of the tank roof.
3. Posts shall be 1/4-inch steel flat bar bent into compatible structural shape or 1-1/4-inch standard weight steel pipe, no more than 7 feet apart. Posts shall be welded to the roof directly or with steel doubler plates per accepted shop drawings.
4. Toe Guard: 4-inch x 1/4-inch thick steel flat bars are to be rolled to match the railing radius and welded to the posts with 1/4-inch vertical gap between the toe guard plate and the roof.
5. All welds shall be minimum 3/16-inch fillet seal welds with all tight spaces filled.
6. Guardrail will be located 6-inches inside the perimeter of the roof plates (top of the knuckle) and rails and toe plates shall be rolled to match this radius.
7. Roof guardrails shall be prepared and coated per the tank exterior coating schedule in Section 09 97 14 Steel Tank Coating.
8. Contractor shall submit detailed shop drawings for the guardrails.

B. Miscellaneous metal fabricated items are not necessarily individually described. Provide all miscellaneous items not described as required to complete metal fabrications Work.

C. Miscellaneous Metal: Provide all miscellaneous steel angles, channels, plates and shapes, threaded rods, pipe, bolts, nuts, washers, spacers, and fastenings shown or required to complete the Work.

2.04 FINISHES

A. Preparation of Surfaces:

1. Thoroughly clean mill scale, rust, dirt, grease and other foreign matter from ferrous metal prior to galvanizing, hot phosphate treatment of painting.
2. Prior to installation apply protective coating to separate dissimilar materials.

B. Hot Phosphate Treatment: Conform to SSPC-PT-4.

C. Galvanizing:

1. Galvanize items after fabrication in largest section practicable, unless otherwise permitted or recommended by ASTM A123.
 2. Where galvanizing is removed by welding or other assembly procedures, touch up abraded areas with molten zinc or zinc-rich paint.
 3. Where ferrous metal item is shown or specified to be galvanized, perform galvanizing in accordance with the following standards as applicable:
 - a. Hardware items including fasteners: ASTM A153.
 - b. Items under 1/8-inch thickness and fabricated from rolled, pressed and forged shapes, plates, bars and stripes: ASTM A386.
 - c. Other fabricated items: ASTM A123.
 4. Plug relief holes exposed by tapping and installing IPS plug and Teflon tape.
- D. Finish schedule: Unless items are furnished factory finished.
1. Ferrous Metal, Interior Items:
 - a. Concealed: Clean, chemically etch and shop apply one (1) prime coat.
 - b. Exposed: Clean, treat with hot phosphate, chemically etch, and shop apply one (1) prime coat. Finish as specified in 09 97 14: Steel Tank Coating.
 - c. Hardware and Fasteners: Cad plated or electro-plated.
 2. Ferrous Metal, Exterior Items:
 - a. Concealed: Clean and hot-dip galvanize in accordance with galvanizing standard.
 - b. Exposed: Clean, then hot-dip galvanize in accordance with galvanizing standards. Finish as specified in 09 97 14: Steel Tank Coating.
 - c. Hardware and Fasteners: Stainless or hot dip galvanized.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive Work and verify that setting conditions and dimensions are satisfactory to receive items.
- B. Do not start installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Bottom joints between roof plates on the tank shall be seal welded for the entire length of the joint. Lift roof plates over rafters as required to complete seal welding.
- B. Install Work plumb, true, rigid, and neatly trimmed out.
- C. Do not tighten fastener through finish without spacer washers.
- D. Install concrete inserts or expansion bolts in predrilled holes for fastening items into concrete.

- E. Fasten Work tightly to prevent rattle or vibration except where expansion-contraction tolerances are required.
- F. Use non-shrink grout mixed in accordance with manufacturer's directions for setting bolt plates and similar items.
- G. Set items shown or required to be installed in sleeves with quick-setting anchor cement unless otherwise specified.
- H. Touch-up Painting:
 - a. Immediately after erection, clean field welds, bolted connections, and abraded area of shop paint and paint all exposed areas with same materials as used for shop painting.
 - b. Apply by brush or spray to provide minimum dry-film thickness of 2.0 mils, except as specified in 09 97 14 "Steel Tank Coating".
 - c. Touch up galvanized surfaces in accordance with AHDGA publication, "Recommended Practice for Touch-up of Damaged Galvanize Coating."
- I. Protect metal from damage to surface, profile, and shape.

END OF SECTION

SECTION 09 97 14 – STEEL TANK COATING

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
1. Perform work on the following tank: Hardin Tank.
 2. Remove existing interior coatings on tank and appurtenances.
 3. Prepare interior surfaces for coating on tank and appurtenances in accordance with SSPC-SP 10/NACE No. 2 Near White Blast Cleaning with specified minimum and maximum surface profile.
 4. Provide and install interior protective coating system, NSF 61 approved for potable water use.
 5. Remove existing exterior coatings on tank and appurtenances.
 6. Prepare exterior surfaces for coating in accordance with SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning.
 7. Provide and install protective exterior coating system.
 8. Provide and install protective coating system for stairs, access platforms, guardrails and handrails, piping and other tank appurtenances.
 9. Provide surface preparation, waste disposal, and pretreatment, coating application, touch-up, protection of surfaces not to be coated, cleanup and appurtenant work.
- B. The Contractor shall employ methods of removal and demolition of the existing tank appurtenances, surface preparation for welding and recoating that prevents any airborne transmission of paint materials.
1. The Contractor is required to submit work plans to the Engineer for the removal of coatings. No metal work, or removal of existing paint shall occur prior to review of the work plans by the Engineer.
- C. The following surfaces shall not be coated, and shall be protected from coatings, unless otherwise indicated.
1. Concrete
 2. Stainless steel
 3. Machined surfaces
 4. Grease fittings
 5. Glass
 6. Equipment nameplates

1.02 REFERENCES

- A. Codes: All Work shall comply with all codes, as referenced herein.
- B. Commercial Standards:
1. The Society of Protective Coatings (SSPC)

2. National Association of Corrosion Engineers (NACE)
3. Association for Materials Protection and Performance (AMPP)
4. American Society for Testing Materials (ASTM)
5. American Water Works Association (AWWA/ANSI)
 - a. AWWA/ANSI D102 Coating Steel Water Storage Tanks
 - b. AWWA/ANSI D100 Welded Carbon Steel Tanks for Water Storage
6. National Sanitation Foundation (NSF)
 - a. NSF/ANSI 61 – Drinking Water System Components
7. American National Standards Institute (ANSI)
 - a. NSF/ANSI 61 – Drinking Water System Components

1.03 DEFINITIONS

- A. Paint, Coatings and Finishes: Surface treatments, emulsions, enamels, paints, epoxy resins, and other protective coatings, except galvanizing or anodizing, whether used as a pretreatment, primer, intermediate coat, or finish coat.
- B. DFT: dry film thickness.

1.04 SUBMITTALS

- A. Coating Manufacturer's Instructions and Recommendations include the following:
 1. Special requirements for transportation and storage.
 2. Mixing instructions.
 3. Shelf life.
 4. Pot life of material.
 5. Precautions for applications free of defects.
 6. Surface preparation including minimum and maximum surface profile.
 7. Method of application.
 8. Ventilation Plan.
 9. Recommended number of coats.
 10. Recommended dry film thickness (DFT) of each coat.
 11. Recommended total dry film thickness (TDFT).
 12. Drying time of each coat, including prime coat.
 13. Required prime coat.
 14. Compatible and non-compatible prime coats.
 15. Recommended thinners, when recommended.
 16. Limits of ambient conditions during and after application.
 17. Time allowed between coats (minimum and maximum).
 18. Required protection from sun, wind and other conditions.
 19. Touch-up requirements and limitations.
 20. Statements on the suitability of the material for the intended use.
 21. Safety data sheets.

22. Standard and custom color options.
- B. NSF/ANSI 61 certification for interior coatings
- C. Shop Drawings: Self-contained coating removal machine, forced heating, dehumidification, ventilation equipment specifications, dust collector, interior and exterior scaffolding, and enclosure to prevent fugitive dust, if used.
- D. Work plans for the removal, handling and disposal of coatings and related personnel protection and safety for the removal of coatings.
- E. Samples:
1. Coating systems on a 3-inch by 3-inch steel sample representative of the existing conditions of the tank. Coat steel samples to match tank coating requirements. Label samples with the coating type, application method and dry film thickness.
 2. Provide samples for each batch of material to be used on the project.
 3. Provide manufacturer's certification that the batches provided as samples match the batches supplied to the job site. Failure to do this may result in rejection of the finished work by the City and removing and re-applying the coating again at the Contractor's expense.
 4. Provide manufacturer's standard details for coating over joints/cracks, pipe penetrations and edge terminations.
- F. Coatings Removal Plan: Submit plan for removal of existing coatings no less than 30 days prior to the removal of any coating including:
1. Sampling program to establish baseline environmental conditions in the area where coatings removal will occur.
 2. Detailed procedure for removal of the coatings, including methods of removal, containment, and environmental and personnel monitoring during the work.
 3. Sampling and testing of the coatings material to determine whether it constitutes a hazardous waste.
 4. Methods of clean up and disposal of the removed coatings and abrasive blast material in accordance with applicable laws.
 5. Post-removal sampling of the area to verify complete cleanup.
- G. Coating Work Safety, See Section 01 54 50 for additional information.
- H. Abrasive Blasting: Dispose of residual waste from abrasive blasting and painting in compliance with state, federal and local regulations. Cover openings to keep abrasive or paint from entering or exiting tank.
- I. Safety Requirements: State, Federal, and local regulations. Personnel and equipment are subject to safety inspections as deemed necessary by the City.

1.05 QUALITY ASSURANCE

- A. Protective Coating Materials

1. This specification is based on products manufactured by Tnemec Company, Inc.
- B. Substitute or “Or-Equivalent” Submittals
1. Substitute materials are acceptable if they are equivalent in quality and performance. Provide complete manufacturing documentation proving material meets the project requirements. Provide testing and analysis for proposed substitute materials (as required by the Engineer) at no additional cost. Provide changes in the work that the substitution requires at no additional cost. See Section 01 25 00 Substitution Procedures.
- C. Qualifications of the Coating Contractor:
1. State of California Class A Contractor’s license. Provide copy of license and certifications.
 2. Three references which verify that the coating contractor has demonstrated successful application of the specified coating systems in the past three years. Provide the name, address and telephone number of a reference person at the location of each installation.
 3. The coatings contractor shall possess and provide a copy of an SSPC-QP1 and QP2 certification.
 4. Provide manufacturer written certification that the coating contractor’s supervisor and each applicator performing work on the project have been trained and approved by the manufacturer to apply the selected coating system.
 5. Provide written certification from the contractor stating that they are qualified and experienced in the application of the specified coating systems.
 6. Conform to State and Federal laws and regulations regarding all facets of removing and disposing of coatings. Abide by laws and regulations associated with the removal and disposal of coatings.

1.06 PERMITS, CERTIFICATES, LAWS AND ORDINANCES

- A. Procure permits, certificates, and licenses required by law for the execution of the work. Comply with all Federal, State, Air Quality District, County, or City laws, ordinances, or rules and regulations relating to the performance of the work.
- B. Conform to National Association of Corrosion Engineers (NACE), The Society of Protecting Coatings (SSPC), Association of Materials Protection and Performance (AMPP), American Water Works Association (AWWA), and coating manufacturer’s printed instructions for surface preparation and painting of surfaces.

1.07 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be brought to the job site in the original sealed and labeled containers of the paint manufacturer and shall be subject to inspection by the Engineer on the job.
- B. Paint material containers shall have labels bearing manufacturer's name, name and type of material, formula or specification number, batch number, color, date of manufacture, color name and number. In addition, thinning instructions and application instructions

shall be available at the job site. All printed materials shall be plainly legible at the time of use.

- C. Do not use products that have exceeded the manufacturer's recommended shelf life or attempt to extend stated pot lives by additional thinning.
- D. Provide temporary storage facilities to protect materials and equipment stored on-site from the elements and unauthorized personnel. The storage facility shall be capable of 24-hour climate control to maintain products within the storage temperature limits recommended by the manufacturer. The location of the storage container shall be approved in advance by the Engineer.
- E. The storage facility shall be capable of containing the coating systems within the storage facility in the event of a spill or rupture.

1.08 INSPECTION AND TESTING

- A. All work relative to preparation for and application of coatings shall be conducted under the supervision of the Inspector representing the Owner.
- B. Prior to the start of any work, provide the Inspector, schedules and notification procedures that will ensure that all surface preparation work has been inspected prior to the application of any coating. These procedures shall remain in effect for the duration of the project. Under no circumstances shall any surfaces be coated without prior approval of the Inspector. Coatings applied without the Inspector's authorization shall be removed and reapplied at the sole expense of the Contractor. Log sheets, approved by the Inspector, shall be used as the permanent record of all inspections with copies forwarded to the Inspector daily.
- C. Prior to surface preparation work, notify Inspector a minimum of seven days in advance.

1.09 RECORDS

- A. Maintain an accurate, written record of the quantity of coating material applied and the corresponding surface area covered, a description of the area coated, the batch number, surface temperature, ambient temperature, relative humidity, dew point, and applicator on a daily basis. Furnish a signed copy of said record to the Inspector at the beginning of the next working day. These records shall be independently verified by the Inspector and reported in the Inspector's log. The Inspector shall immediately investigate and resolve any discrepancies between these reported quantities and other information.

1.10 SERVICES OF COATING MANUFACTURER

- A. Furnish the following services:
 - 1. The coating manufacturer's representative shall be present during the pre-coating review meeting with the contractor and the inspector.

2. Provide onsite technical support to resolve field problems associated with the manufacturer's products furnished under this Contract or the application thereof throughout the duration of the Work.
3. The coating manufacturer's representative shall be present during the final inspection of the finished coating if requested by the Inspector.

1.11 WARRANTY

- A. Contractor shall provide a warranty on materials and coatings work for 1 year beginning with the final acceptance of the project.
- B. Provide standard 1-year minimum Manufacturer's Limited Warranty on materials.

1.12 ENVIRONMENTAL REQUIREMENTS

- A. Comply with the manufacturer's recommendations as to environmental conditions under which the coating systems may be applied and cured.
- B. Coating shall not be applied: when the metal temperature is less than 50°F; when the air temperature is less than 5°F above the dew point; when the expected weather conditions are such that the temperature will drop below 40°F or less than 5°F above the dew point within six (6) hours after the coating has been applied; or when the temperature or relative humidity is above or below the manufacturer's recommendation.
- C. Abrasive blasting and/or painting shall not be performed inside the tank whenever the above conditions exist.
- D. Provide dehumidification. Maintain a continuous record of temperature and relative humidity.
- E. Relative humidity and dew point shall be measured or confirmed by use of a sling psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychrometric Tables.
- F. Do not apply paint in areas where dust is being generated.
- G. The Contractor shall conduct his operations to ensure that no paint or solvents are allowed to enter surface waters or the ground.
- H. Provide complete environmental containment and environmental control of the tank for all activities related to coatings removal, surface preparation and application of coatings unless other approved dust containment methods are used such as wet abrasive blasting with approved fluid containment or approved self-contained wheel coatings removal machine with shot media recycling and integral local vacuum removal of all dusts. See Section 3.06 herein.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tnemec Company Inc. or approved equal.

2.02 COMPATIBILITY

- A. Use compatible materials from a single manufacturer. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, subject to the approval of the Engineer, a barrier coat shall be applied between existing prime coat and subsequent field coats to ensure compatibility.

2.03 EXTERIOR COLORS

- A. Finish color shall be “Petaluma Tank Green” Tnemec Color #G9959A.
- B. Each coat shall be of a different shade, to facilitate inspection of surface coverage for each coat.

2.04 MATERIALS

- A. Abrasives
 1. Manufacturer: Kleen Blast or approved equivalent.
 2. Performance requirements: produce a surface profile that meets the coating manufacturer’s recommendations.
 3. Provide new, clean, abrasives in unopened, weather resistant, airtight containers. Do not reuse abrasive materials unless approved by the Inspector.
 4. Conform to Bay Area Air Quality Management District requirements. No more than one (1) percent free silica is allowed on the job site.
 5. Disposal shall be in accordance with all federal, state, and local laws at no cost to the City.
- B. Coatings:
 1. Interior and exterior coatings shall be provided by a single manufacturer in accordance with the Coating Schedules contained herein.
 2. Interior coatings and thinners shall be NSF 61 and 600 approved.
 3. Exterior finish topcoat shall be semi-gloss finish.
- C. Interior Coating Schedule (Total DFT 20 to 30 mils)
 1. Interior coatings below water line (below 4 feet below top of shell)
This includes the shell, floor, overflow piping, mixing piping, etc.
 - a. System Type: 100% Solids Epoxy
 - b. AWWA D102-21 Inside Coating System No. 3
 - c. Surface Preparation: All surfaces shall be prepared in accordance with SSPC-SP10/NACE No. 2 Near-White Blast Cleaning with minimum surface profile of 3.0 mils.

- d. Stripe-Coat Procedure: Tnemec Series FC22 Epoxoline or Series 22 Epoxoline brush-applied or spray-applied and back-brushed to all welds and sharp edges per SSPC-PA1.
 - e. Prime/Finish Coat: Tnemec Series FC22 Epoxoline or Series 22 Epoxoline at 20.0 to 30.0 mils DFT applied in one or two coats.
 - f. Total System: The total dry film thickness shall be 20.0 mils minimum.
2. Interior coatings above the water line (above 4 feet below top of shell)
The includes top 4 feet of the shell, knuckle, roof, rafters and roof supports, and inside of roof hatches and vents.
- a. System Type: Organic Zinc Primer and 100% Solids Epoxy
 - b. AWWA D102-21 Inside Coating System No. 3.
 - c. Surface Preparation: All surfaces shall be prepared in accordance with SSPC-SP10/NACE No. 2 Near-White Blast Cleaning with a surface profile minimum of 1.5 mils and maximum of 3.0 mils.
 - d. Prime Coat: Tnemec Series 94-H20 Hydro-Zinc at 2.5 to 3.5 mils DFT.
 - e. Stripe-Coat Procedure: Tnemec Series FC22 Epoxoline or Series 22 Epoxoline brush-applied or spray-applied and back-brushed to all welds and sharp edges per SSPC-PA1.
 - f. Finish Coat: Tnemec Series FC22 Epoxoline or Series 22 Epoxoline at 20.0 to 30.0 mils DFT applied in one or two coats.
 - g. Total System: The total dry film thickness shall be 25.5 mils minimum.
- D. Exterior Coating Schedule (Total DFT 8.5 to 12.5 mils)
- a. System Type: Organic Zinc Primer, Epoxy Intermediate and Fluoropolymer Finish Coat.
 - b. Surface Preparation: All surfaces shall be prepared in accordance with SSPC-SP6/NACE No. 3 Commercial Blast Cleaning with a surface profile minimum of 1.5 mils and maximum of 3.0 mils.
 - c. Prime Coat: Tnemec Series 94-H20 Hydro-Zinc at 2.5 to 3.5 mils DFT.
 - d. Stripe-Coat Procedure: Series L69 Hi-Build Epoxoline II brush-applied or spray-applied and back-brushed to all welds and sharp edges per SSPC-PA1.
 - e. Intermediate Coat: Tnemec Series L69 Hi-Build Epoxoline II at 4.0 to 6.0 mils DFT.
 - f. Finish Coat: Tnemec Series V700 HydroFlon gloss or Series V701 HydroFlon semi-gloss at 2.0 to 3.0 mils DFT.
 - g. Total System: The total dry film thickness shall be 8.5 to 12.5 mils.

PART 3 EXECUTION

3.01 WORKMANSHIP

- A. Apply coatings under dry and dust-free conditions. Produce an even film of uniform thickness. Thoroughly clean edges, corners, crevices and joints to ensure they receive an

adequate thickness of coating material. Finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks and variations in color, texture, and finish.

B. Clean, repair and refinish surfaces to original condition where damage occurs.

3.02 PROTECTION OF SURFACES NOT TO BE COATED

A. Remove, mask and protect surfaces not to be coated. Provide drop cloths to prevent coating materials from falling on or marring adjacent surfaces.

3.03 PREPARATION

A. Clean surfaces to receive protective coatings. Examine surfaces to be coated. Correct surface defects before application of coating material. Touch-up and restore marred or abraded spots on shop-primed and on factory-finished surfaces prior to coating application.

B. Surface preparation for ferrous surfaces

1. Conform workmanship for metal surface preparation of interior tank surfaces and appurtenances to the current AMPP and SSPC Standards and this Section. Blast cleaned surfaces shall conform to SSPC-SP 10 Near White Blast Clean set forth by the Association for Material Protection and Performance (AMPP) and Society for Protective Coatings (SSPC).
2. Conform workmanship for metal surface preparation of exterior tank surfaces and appurtenances to the current AMPP and SSPC Standards and this Section. Blast cleaned surfaces shall conform to SSPC-SP 6 Commercial Blast Clean set forth by the Association for Material Protection and Performance (AMPP) and Society for Protective Coatings (SSPC).
3. Remove oil, grease, welding flux, and other surface contaminants by solvent cleaning per SSPC-SP 1 prior to abrasive blast cleaning.
4. Chamfer or round sharp edges. Grind burrs, surface defects and weld splatter prior to abrasive blast cleaning.
5. Select type and size of abrasive to produce a surface profile that meets the coating manufacturer's recommendation, minimum and maximum, for the particular coating and service conditions. Abrasives for submerged and severe service coating systems shall be clean, hard, sharp cutting crushed slag or abrasive approved by Engineer.
6. Do not reuse abrasive unless otherwise approved by the Engineer. Maintain clean, oil-free abrasives for automated shop blasting systems.
7. Comply with the applicable federal, state, and local air pollution control regulations for blast cleaning.
8. The exhaust from blasting shall be filtered to remove particulate matter.
9. Supply compressed air for air blast cleaning at adequate pressure from well-maintained compressors equipped with oil/moisture separators that remove at least 95 percent of the contaminants.
10. Clean surfaces of dust and residual particles of the cleaning operation by dry air blast cleaning, vacuuming or another approved method prior to painting.

11. Vacuum clean enclosed areas and other areas where dust settling is a problem. Wipe those areas with a tack cloth afterwards.
 12. Collect and dispose of all water and debris from tank cleaning per Section 01 35 13 Special Project Procedures.
 13. Remove damaged or defective coating by the specified blast cleaning to meet the clean surface requirements before recoating.
 14. Completely remove shop applied coatings of unknown composition before the specified coatings are applied. Examine valves, castings, ductile or cast-iron pipe, and fabricated pipe or equipment for the presence of shop-applied temporary coatings. Clean temporary coatings by solvent cleaning per SSPC-SP1 before being completely removed by abrasive blast cleaning.
 15. Solvent clean shop primed equipment in the field before finish coats are applied.
- C. Plastic, fiber glass and nonferrous metals surface preparation:
1. Sand or brush-off blast clean plastic and fiber glass surfaces prior to solvent cleaning with a chemical compatible with the coating system primer.
 2. Solvent-clean (SSPC-SP1) non-ferrous metal surfaces followed by sanding or brush-off blast cleaning (SSPC-SP7). Galvanized metal surfaces shall be cleaned per SSPC-SP1 Solvent Cleaning followed by SSPC-SP16 4 Brush-Off Blast Cleaning providing a surface profile of 1.0 to 1.5 mils.
 3. Clean surfaces and dry prior to coating application.

3.04 MIXING AND THINNING OF MATERIALS

- A. Strictly observe the coating manufacturer's printed recommendations and instructions for thinning, mixing and handling its coating materials. Prepare multiple component coatings using all of the contents of the container for each component as packaged by the manufacturer. Do not use partial batches. Do not use multiple component products that have exceeded their shelf life. Provide four kits for touch-up and small area work. Mix only the components specified and furnished by the manufacturer. Do not intermix additional components for reasons of color or otherwise.
- B. Thinners used for interior tank coatings shall be NSF 61 approved.

3.05 APPLICATION

- A. The application of protective coatings to steel substrates shall be in accordance with "Paint Application Specification No. 1, (SSPC-PA1)," The Society of Protective Coatings.
- B. Inspect cleaned surfaces and coats prior to each succeeding coat. Schedule inspection with the Inspector in advance.
- C. Paint blast cleaned ferrous metal surfaces before rusting or other surface deterioration occurs. Limit blast cleaning to only those surfaces that can be coated in the same working day except where environmental controls are used and approved by Inspector.

- D. Apply coatings in accordance with the manufacturer's instructions and recommendations, and this Section, whichever has the most stringent requirements.
- E. Special attention shall be given to edges, angles, weld seams, flanges, nuts and bolts and other places where insufficient film thicknesses are likely to be present. Stripe paint these areas using a brush, with the same primer material specified for the particular service or as recommended by manufacturer.
- F. Special attention shall be given to surfaces that will be joined so closely that proper surface preparation and application are not possible. Such contact surfaces shall be coated prior to assembly or installation.
- G. Special attention shall be given to existing surfaces that are joined so closely that proper surface preparation and application are very difficult, in particular areas where the roof is close to the tops of rafters. Contractor shall wedge apart the roof panels from the top of the roof rafters in order to gain access for surface preparation and coating operations.
- H. Finish coats, including touch-up and damage repair coats shall be applied in a manner that will present a uniform texture and color-matched appearance.
- I. Do not apply coatings under the following conditions:
 - 1. Temperature exceeding the manufacturer's recommended maximum and minimum allowable.
 - 2. Dust or smoke laden atmosphere.
 - 3. Damp or humid weather exceeding the manufacturer's recommended maximum and minimum allowable.
 - 4. When the substrate or air temperature is less than 5 degrees F above the dew point.
 - 5. When air temperature is expected to be less than 5 degrees F above the dew point within 6 hours after application of coating.
 - 6. Dew point shall be determined by use of a sling psychrometer in conjunction with U.S. Dept. of Commerce, Weather Bureau psychrometric tables.

3.06 CLIMATE CONTROL AND AIR QUALITY PROTECTION

- A. Contractor shall provide complete environmental control of all tank activities related to coating application, coating removal, and surface preparation to prevent overspray, odor, or dust related to removed coatings or abrasives from contaminating the air, depositing onsite, or traveling offsite. Contractor shall comply with CCR Title 17, SSPC Guide 6 and all relevant air quality regulations such as those administered by the Bay Area Air Quality District.
- B. Containment enclosures must use heat welded seams and be inspected by the Engineer prior to any coating operations. Adhesives and Adhesive tapes will not be allowed for seams of enclosures. Sufficient ventilation shall be provided such that there is a consistent negative pressure within containment and/or the tank during all coatings operations to prevent any fugitive emissions.

- C. Contractor may submit for approval dust containment methods that may not require enclosing the entire tank such as wet abrasive blasting with approved fluid containment or approved self-contained wheel coating removal machines with shot media recycling and integral local vacuum removal of all dusts.
- D. Contractor shall control environmental conditions including air/steel temperatures, moisture, and humidity to comply with the manufacturer's recommendations for application and curing, including during any work during the winter.

3.07 CURING OF COATINGS

- A. Provide curing conditions in accordance with the conditions recommended by the coating material manufacturer or by this Section, whichever is the highest requirement, prior to placing the completed coating system into service.
- B. Forced air ventilation.
 - 1. Forced air ventilation and dehumidification is required for the application and curing of coatings on the interior surfaces of enclosed hydraulic structures.
 - 2. All solvent vapors shall be completely removed by suction type, explosion-proof exhaust fans and blowers.
 - 3. During curing periods, continuously exhaust air from the lowest level of the structure using portable ducting.
 - 4. Air shall not be forced from the outside into the enclosure.
 - 5. Ventilation system shall be approved by the Engineer prior to the start of work.
 - 6. Ventilation systems, using heated air when applicable, shall remain in service during coating application and for a minimum of seven (7) days after completion of final coating application or coating repair, or until coating has fully cured.
 - 7. Fuel or electricity costs shall be borne by the contractor unless specified otherwise.
 - 8. After all interior coating operations have been completed provide a final curing period as required by the manufacturer during which the forced ventilation system shall operate continuously.
- C. Submit Ventilation Plan a minimum of two weeks before beginning work inside the tank.
 - 1. No work may begin inside the tank until the Ventilation Plan has been accepted by the Engineer.

3.08 APPROVAL

- A. Inspection and Testing
 - 1. Conduct final inspection at the completion of coating work. The Contractor and its Supervisor, a representative of the coating manufacturer, and the Construction Observer and/or other representative of the City shall conduct a final inspection to establish that all work has been completed per the Contract Documents.
 - a. All coated surfaces will be inspected for the following defects:
 - Orange-peel
 - Holidays, missed areas

Mud cracking	Over spray
Sanding Scratches	Contaminants, including spent abrasives
Runs, sags, curtains	Mechanical damage – chipping, chips, scratches
Sand lines	Excessive or insufficient gloss
Pinholes	Fisheyes
Blisters	Unmatched colors
Bubbling	

- b. Before final acceptance of the Work will be granted, Contractor shall document deficiencies found and corrected.
 - c. Contractor shall thoroughly document the conditions of each area of work at the time of inspection using video and still photography. Provide a copy of the photographs and video to the City and keep the originals. The photographs and video shall be the basis of evaluation of the condition of the coating systems at the warranty inspection.
2. Erect or move scaffolding or ladders to locations where requested by the Inspector to facilitate inspection.
 3. Whenever required by the Inspector, provide additional illumination required for inspections. Adequate illumination shall include explosion-proof lights and electrical equipment where required to meet safety standards. The Inspector shall determine the level of illumination for inspection purposes.
 4. Inspection Devices: Provide the items listed below (or approved equals) to complete the inspections in the presence of the Inspector, in good working order and with calibration data prior to beginning work. Inspection devices shall remain available until final acceptance of the coating applications:
 - a. Film Thickness: Non-destructive measurement devices.
 - b. U.S. Department of Commerce, National Bureau of Standards, certified thickness calibration plates to test accuracy of dry film thickness gauge.
 - c. Pinhole and Holiday Detection: holiday detectors capable of, and set to, the manufacturer's recommended voltages.
 - d. Sling Psychrometer.
 - e. Surface Temperature: High quality IR thermometer or Magnetic surface temperature gauge.
 - f. Coating Adhesion Testing:
 - 1) Elcometer Model 106 or equivalent.
 5. Film Thickness: Inspect prepared surfaces and coating system component applications prior to each succeeding application. Collect representative thickness data as follows:
 - a. Thickness of coatings on metal surfaces shall be checked with a properly calibrated, non-destructive type thickness gauge. Each coat shall be checked for correct thickness. No measurements shall be made after the manufacturer's recommended curing time, or until at least 8 hours after application of the coating.

- b. Inspector shall determine where and how often to test for film thicknesses, and at a minimum the requirements of SSPC-PA-2 Level 3 will be followed.
 - c. At each inspection point, record a minimum of three gauge readings.
 - d. Discard unusually high or low gauge reading that cannot be repeated consistently. Take the average (mean) of the three gauge readings as the spot measurement. The average spot measurement shall meet or exceed the specified dry film thickness for each application.
6. Coating Pinhole and Holiday Detection of Tank Interior Surfaces:
- a. Furnish an appropriate holiday detector as recommended by the coating and gauge manufacturers and use in inspecting the finished coating job at the voltage recommended for the coating system.
 - b. Contractor shall perform the test on all surfaces to be submerged in the presence of the inspector.
 - c. Holiday detectors shall not exceed the voltage recommended by the manufacturer of the coating system.
 - d. The electrode movement over the coating surface shall be continuous and shall proceed in a systematic manner which ensures 100 percent coverage of the coating surface.
 - e. All pinholes shall be marked, repaired in accordance with the manufacturer's recommendations and retested.
 - f. No pinholes or other irregularities will be permitted in the final coating.
 - g. Deficiencies in the continuity of the coating shall be corrected by applying additional finish coats, at the expense of the Contractor.
7. Contractor shall correct all deficiencies to the satisfaction of the Inspector.
- a. Defects in any coat of multiple coat applications must be repaired prior to application of subsequent coats.
 - b. Coating defects may only be rectified after the coating in which the defect occurred has dried/cured sufficiently, unless approved otherwise by the Engineer.
 - c. Usage of rollers to mask or obliterate defects in sprayed coatings will result in rejection of the work.
 - d. In case of numerous or significant defects, the Engineer may require complete removal and replacement of all coatings applied by the Contractor.
 - e. All defects shall be corrected by the Contractor at the Contractor's expense.
- B. Disinfection per Section 33 13 13 Water Storage Tank Disinfection.
- C. Bacteriological Sampling and Testing
1. The City will sample and test for bacteriological compliance to all pertinent regulations. The contract shall coordinate and assist the City as requested.
- D. Testing for Volatile Organic Compounds
1. Testing for Volatile Organic Compounds (VOCs) will not be required, unless at the discretion of the Inspector, it is suspected that the contractor has introduced VOCs in the tank. Examples of this may include not providing for proper curing of

coatings per the manufacturer's recommendations or introducing solvents or thinners of a type, amount or method not approved by NSF 61 and 600 for use in potable water storage tanks.

2. Testing for volatile organic compounds (VOCs), if required, shall be done by the contractor at his expense in accordance with California Department of Public Health (CDPH) Sanitation and Radiation Laboratory guidelines set forth in "Collection, Pretreatment, Storage, and Transportation of Water and Wastewater Samples," most current edition.
3. If VOC testing is required, the tank shall be filled, and the contents retained for seven (7) calendar days. Prior to contents release for distribution, a sample of water shall be taken by the City and analyzed according to CDPH requirements. Such testing shall be at the City's expense and performed by the City's representative.
4. In some instances, Contractor may find it necessary to extend coating cure times beyond manufacturer's recommendations in order to achieve satisfactory action levels, due to temperatures and humidity conditions at project site.
5. If test results reveal unacceptable levels of impurities or volatile organic compounds, tank shall be drained, flushed, refilled, and retested. Such remedial action will be performed at Contractor's expense, and will be continued until satisfactory levels are achieved. The Contractor will be required to pay for additional testing, corrective actions, water disposal and water to refill the tank. The Contractor is responsible for controlling the rate of discharge through the drain line to prevent erosion as approved by the Engineer.
6. Disposal of liquids drained from the tank shall be the responsibility of the Contractor. Submit discharge plan to North Coast Regional Water Quality Control Board for approval. Do not discharge until submitted discharge plan is approved.

E. Acceptance

1. Upon successful completion of all inspection and testing, and upon receipt by the City of the Contractor's Warranty, the City shall issue a Notice of Completion.
2. Warranty Inspection: A warranty inspection shall be conducted as outlined in AWWA D102, Section 5.2, within 11 months following completion and acceptance of all coating and painting work. The City shall establish a date for the inspection and notify the Contractor thirty days in advance. All parties present at the Pre-Job conference, including the coating manufacturer's representative, are required to attend this inspection. The City shall drain the tank and the Contractor shall supply suitable interior lighting for the inspection. The Contractor shall prepare a report for the City. Any work found to be defective shall be repaired in accordance with the manufacturer's recommendations, this specification and to the satisfaction of the Engineer. Repair of the tank shall be at the City's convenience and shall be performed within such stated date as the City designates.

3.09 REPAIRS

- A. If an area is found to have an improper finish, insufficient film thickness or other deficiencies; clean, prepare and topcoat the coating surface per the manufacturer's recommendations to obtain the specified finish and coverage. Work shall be free of runs, bridges, shiners, laps or other imperfections.

- B. Damaged or defective coating shall be removed by the specified blast cleaning to meet the clean surface requirements before recoating.

END OF SECTION

SECTION 26 00 00 - ELECTRICAL

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall install, ready for use, the electrical and instrumentation system as specified herein and shown on the Contract drawings. This document describes the function and operation of the system and particular components, but does not necessarily describe all necessary devices. All components and devices shall be furnished and installed as necessary/required to provide a complete operable and reliable system for accomplishing the functions and meeting the performance set forth hereinafter.
- B. Furnish all required labor, materials, project equipment, tools, construction equipment, safety equipment, transportation, test equipment, incidentals, and services to provide a complete and operational electrical & instrumentation system, as shown on the E&I - Series Drawings included in these Specifications or required for a fully operating facility.
- C. Examine the specification and Drawings for mechanical equipment and provide all circuit breakers, switches, pushbuttons and appurtenances which are not specified to be with the mechanical equipment. Erect all electrical equipment not definitely stated to be erected by others, furnish and install conduit, wire and cable and make connections required to place all equipment in complete operation.
- D. For any planned job walks, it is recommended that the Electrical Contractor attend the job walk for the site and shall have accomplished the following:
 - 1. Thoroughly examine existing conditions before submitting his bid proposal to perform any work. He shall compare site conditions with data given on the plans or in these Specifications. No allowance shall be made for any additional costs incurred by the Contractor due to his failure to have examined the site or to have failed to report any discrepancies to the Owner prior to bid.
 - 2. It is the Contractor's responsibility to be fully familiar with the existing utility locations, conditions and local requirements and regulations.
 - 3. Verify all measurements and conditions and shall be responsible for the correctness of same. No extra compensation will be allowed because of differences between Work shown on the Drawings and measurements at the site.
- E. Any major deviations in location and conduit routing that the Contractor makes without the express written review or direction of the Engineer, shall be considered to have been made at the Contractor's sole responsibility. Such deviations made by the Contractor shall be reflected on the Contractor supplied "Record Drawings."

The Owner will reimburse the Engineer and the Owner will then deduct an amount equal to said reimbursement from the Contractor's contract for all engineering, drafting, and clerical expenses associated with updating the Record Drawings due to any major unauthorized changes.

- F. The major areas in the scope of work shown on E - Series Contract Drawings and Device Index located in Appendix "B" which includes the furnishing and installation:
1. Utility meter/main pedestal, Electrical Control Cabinet, manual transfer switch, RTU cabinet, tank & vault lighting and miscellaneous devices.
 2. Instrumentation and other miscellaneous devices. This includes all wiring and cables.
 3. Antenna mast & conduits.
 4. Provide all necessary conduits, junction boxes, grounding system, field interconnection wiring, hardware, fittings, and devices to connect the designated equipment and wiring.
 5. Installation of primary devices, equipment and instruments are not completely detailed on Contract Drawing plan sheets. Use Device Indexes and Contract Drawings installation details for installation and mounting requirements.
 6. All necessary miscellaneous shut off, sample, and calibration valves to sensors.
 7. Grounding system and equipment grounding.
 8. Concrete pads and supports for electrical and instrumentation equipment
 9. Remove and dispose of all excess dirt, paving, concrete, and other materials from site work.
 10. RTU backpan, PLC programming and configuration of SCADA system will be by Others.
- G. Existing site is limited in space. It is the Contractor's responsibility to provide an electrical and instrumentation package to fit in the allocated space.
- H. Provide all necessary hardware, conduit, wiring, fittings, and devices to connect the electrical equipment provided under other Sections.
- I. All electrical equipment and materials, including installation and testing, shall conform to the applicable codes and standards listed in this and other Sections. All electrical work shall conform with the National Electric Code (NEC) 2021 issue. Nothing on the Drawings or in the Specifications shall be construed to permit work or materials not conforming to these codes and standards.

- J. The following specifications incorporate specific equipment and devices that are standards of the Owner because of their serviceability, because of the local availability of labor, parts and materials, or because of the ability of the Owner to umbrella the equipment under existing maintenance contracts; however, favorable alternatives proposed in writing will be considered by the Owner.
- K. Contractor shall field verify all existing conditions, equipment, wires, conduit, etc. as required to complete the project.

1.02 CODES AND STANDARDS

- A. All electrical/instrumentation equipment and materials, including installation and testing, shall conform to the following applicable codes and standards:
 - 1. ANSI - American National Standards Institute, Inc.
 - 2. EIA - Electronics Industries Association.
 - 3. ETL - Electrical Testing Laboratories.
 - 4. FM - Factory Mutual.
 - 5. GO128 - General Order No. 128, Rules for Construction of Underground Electrical Supply and Communication Systems, Public Utilities Commission of the State of California.
 - 6. IEEE - Institute of Electrical and Electronics Engineers.
 - 7. ICEA - Insulated Power Cable Engineers' Association.
 - 8. ISA - International Society of Automation (ISA) Standards (formerly Instrument Society of America.
 - 9. NEC - National Electrical Code, 2020 Edition.
 - 10. NEMA - National Electrical Manufacturers Association.
 - 11. NETA - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, International Electrical Testing Association.
 - 12. NESC - National Electrical Safety Code.
 - 13. NFPA - National Fire Protection Agency & NFPA820
 - 14. OSHA - Occupational Safety and Health Act Standards.
 - 15. UL - Underwriter's Laboratories, Inc.
- B. The revisions of these codes and standards in effect on the date of issuance of the Contract Documents shall apply.
- C. Codes and standards referenced shall be considered minimum acceptable work.
- D. In instances where two or more codes are at variance, the most restrictive requirements shall apply.
- E. All electrical work shall conform with the National Electric Code (NEC) 2021 issue and the latest NFPA 70E. Nothing on the Drawings or in the Specifications shall be

construed to permit work or materials not conforming to the preceding codes and standards.

- F. All work shall also be performed in accordance with the Owner, State, County or Owner standards, and local Utility codes.
- G. The Contractor shall furnish without extra charge any additional material and labor which may be required for compliance with these codes and standards, even though the work is not explicitly mentioned in the Specifications or shown on the Contract E- Series Drawings.
- H. Amperage listed on the single-line Drawings for motors are per NEC Table 430.250 and may not necessarily match that of the equipment supplied. It is the electrical system supplier and Contractor's responsibility to furnish equipment sized for the motors supplied for this project at no additional cost.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Provide electrical system that interfaces to work performed under other Mechanical and Equipment plans.

1.04 ELECTRICAL CONTRACTOR QUALIFICATIONS

- A. It is the intent of this Division that the complete responsibility for management and installation of the electrical and instrumentation required for this project be by a qualified Electrical Contractor. This responsibility includes, but not limited to, supervision and coordination of work performed by all suppliers of Division 26.
- B. Uncertified electricians shall not perform electrical work for which certification is required per Labor Code Section 3099. Electricians shall be required to carry proof of certification on their person at all times. Electricians found on the jobsite without proof of certification will be asked to leave, prohibited from working on-site until proof of certification has been provided and may be reported to the Contractors State License Board (CSLB).
- C. The Electrical Subcontractor shall meet the following minimum qualifications:
 - 1. Has a current C-10 Electrical Subcontractor's License.
 - 2. Has regularly engaged in similar electrical contracting for the Municipal Water Industry.
 - 3. Has successfully performed work of similar or greater complexity on at least two previous projects under one company name and under the present company name.
 - 4. Has all persons performing work as electricians certified by the California Apprenticeship Council per California Labor Code Section 3099.

5. Has been actively engaged in the type of electrical and instrumentation work specified in this Division for a minimum of two years.

1.05 SYSTEM SUPPLIER QUALIFICATIONS

A. General:

1. It is the intent of this Division that complete responsibility in the supplying of the RTU system, and all instrumentation in Appendix "B" Device Index and other equipment required for this project be supplied by one System Supplier. This responsibility includes, but not limited to, all work necessary to select, furnish, program, supervise installation, calibrate, and place into operation all transmitters, instruments, controllers, alarm equipment, monitoring equipment, and accessories as specified herein.
2. The system supplier shall have an on staff project engineer with prior experience on similar sized projects. This project engineer shall coordinate the technical aspects of this project and prepare the submittals and drawings. The system supplier project engineer shall attend all coordination meetings and be on-site when requested by the Owner's Engineer.

B. Pre-Qualified System Suppliers

1. The Suppliers listed below have been determined to meet minimum qualifications specified in this Division and are pre-qualified by the Owner for providing supplier bids as system suppliers on the project.
 - a. Tesco (phone 916 395-8800)
 - b. Technical Systems Inc. (TSI) (phone 530 710-3325)
 - c. Primex Controls (phone 707 449-0341)
 - d. Control Systems West (phone 707 763-1108)

C. Non-Pre-Qualified System Suppliers

1. System Suppliers not pre-qualified by the Owner shall submit the information listed herein at least 14 calendar days prior to bid opening, and if approved by the Owner, will be listed in a Contract addendum prior to bid.
 - a. Company history.
 - b. List of five (5) completed projects of similar size and nature for water treatment plants.
 - 1) Provide completion dates of projects.
 - 2) References of Owner Representative in charge of project, including contact name and telephone number.
 - c. List of projects in progress.
 - 1) Description of scope of projects.
 - 2) Dollar amount of projects.

- 3) References of Owner Representative in charge of project, including contact name and telephone number.
- d. Complete 2023 Year End Financial statement prepared by a Certified Accountant or complete 2023 Company Tax Returns listing assets and liabilities.
2. Factory test for this project shall be held within 150 miles of project location at the System Suppliers shop.
3. Additional information for clarification as requested by the Owner in writing shall be provided by the System Supplier asking for the qualification or qualification will automatically be denied.
4. System Supplier providing financial statements lacking detail or stating that detailed financial records are proprietary will be disqualified as a qualified System Supplier and is grounds alone for disqualification.
5. Any qualification package deemed incomplete or lacking sufficient information to determine qualification will result in System Supplier not being qualified.
6. No reason will be released on why a System Supplier was not qualified.

1.06 CONTRACT DOCUMENTS

- A. The Contract drawings and specifications are intended to be descriptive of the type of electrical system to be provided; any error, omission, or minor details missing in either shall not relieve the Contractor from the obligations there under to install in correct detail any and all materials necessary for a complete operational system, at no additional cost.
- B. The Contract drawings are generally diagrammatic; exact locations of electrical products shall be verified in the field with the Engineer. Except where special details on drawings are used to illustrate the method of installation of a particular piece or type of equipment or materials, the more restrictive of the two shall take precedence in the event of conflict.
- C. The Contract Electrical elementary, elevation and one-line diagrams are the basis of the electrical system to be provided and are for reference only. It is the Contractor's responsibility to adjust and make minor revisions to the diagrams as necessary for operational system at no additional cost to the Owner. Additional isolators, relays, wiring, terminal blocks, and appurtenances, shall be provided for an operation system at no additional cost to the Owner.
- D. Location at facilities of new equipment, inserts, anchors, panels, pull boxes, conduits, stub-ups, and fittings for the electrical system are to be determined by the Contractor and Engineer at time of installation. Contractor shall make minor adjustments to locations of electrical equipment required by existing conditions and coordination with other trades at no additional cost.

- E. The Conduit and Wire Routing Schedule, wire fill, and number of conduits are based on the best information available.
 - 1. It is the Contractor's responsibility to modify the conduit schedule based upon Shop Drawings for the actual equipment. Such modifications in conduit sizes and numbers of conductors shall be at no additional cost to the Owner, if such changes are the direct result of the equipment selected by the Contractor.
 - 2. A copy of the Conduit and Wire Routing Schedule and Electrical plans showing conduit routing shall be updated weekly by the Contractor. Progress payments will be withheld if during monthly checks it is found that the Contractor fails to maintain the Conduit Schedule updates.
- F. Electrical & instrumentation, conduit & wire lengths shown on Contract Drawings are approximate. The Contractor is responsible for determining actual lengths for bidding and installation purposes. Contractor is to be made aware that equipment may be installed in the lower levels of the building and instrumentation manufacturer's cable length depends on conduit routing.
- G. The Contractor shall examine the architectural, mechanical, structural, electrical and instrumentation equipment provided under other Sections of this Contract in order to determine the exact routing and final terminations for all conduits and cables. The exact locations and routing of cables and conduits shall be governed by structural conditions, physical interferences, and the physical location of wire terminations on equipment. Conduits shall be stubbed up as near as possible to equipment.
- H. All equipment shall be installed and located so that it can be readily accessed for operation and maintenance. The Engineer reserves the right to require minor changes in location of equipment, without incurring any additional costs.
- I. Provide means to furnish equipment and accessories, do the installation, complete connections, submit documentation, perform start-up and be responsible for the warranty.
- J. Where conduits are shown as "home runs" on the Contract drawings or stated to be furnished, but not explicitly shown as part of the scope of work; the Contractor shall provide all fittings, boxes, wiring, etc., as required for completion of the raceway system, in compliance with the NEC and the applicable specifications in this Section.
- K. No changes from the Contract drawings or specifications shall be made without written approval of the Engineer. Should there be a need to deviate from the Contract documents, submit written details and reasons for all changes to the Engineer for favorable review within 30 days after award of Contract.

- L. When existing conduits are to be used, it is the Electrical Contractor's responsibility to verify conduit size and routing. This includes all potholing or other location methods. Existing conductors and conduits damaged by Contractor during construction shall be repaired or replaced at no cost to Owner.
- M. The resolution of conflicting interpretation of the Contract documents shall be as determined by the Engineer.
- N. The Contractor shall coordinate with other Suppliers on the project for a complete and operable system.
- O. It is the System Supplier's responsibility for obtaining instrumentation transmitter configuration software, manuals, USB drives and disks necessary for the Contractor to program and configure the instrumentation transmitters.
- P. The Electrical Contractor shall maintain a separate set of neatly and accurately marked set of Record Documents, consisting of spreadsheets, specifications and full size blue-line Electrical (E-Series) Contract Drawings.
 - 1. These documents are to be used specifically for recording the as built locations and layout of all electrical and instrumentation equipment, routing of raceways, junction and pull boxes, and other diagram or document changes.
 - 2. These Record documents shall be kept up-to-date during the progress of the job, with all "change orders," submittal modifications, and construction changes shown and stamped with "As-Built" at end of job.
 - 3. These Record documents shall not be used for daily construction use and shall not contain any mark-ups that are unrelated to as-built corrections.
 - 4. The following lists the record documents shall be as-built by Electrical Contractor:
 - a. E-Series Drawings.
 - b. Panelboard schedules.
 - c. Conduit and Wire Routing Schedule.
 - d. Lighting Schedule.
 - e. Duct banks and their routing with offset measurement and indicate changes in depth. Duct bank elevations shall not be drawn or penciled in by hand. Provide CAD drawings of duct banks.
 - 5. The following lists the record documents that shall be as-built by System Supplier to be maintained by Electrical Contractor:
 - a. Instrumentation Index.
 - 6. Record documents shall be kept current weekly with all "change orders," submittal modifications, and construction changes shown. Record Documents shall be subject to the inspection by the Engineer at all times,

progress payments or portions thereof may be withheld if Record Documents are not accurate or current.

7. When documents are changed, they shall be marked with erasable colored pencils using the following coloring scheme:
 - a. Additions - red
 - b. Deletions - green
 - c. Comments - blue
 - d. Dimensions - black
8. Show the following on the Electrical (E-Series) Record Contract Drawings by dimension from readily obtained base lines:
 - a. Exact location, type and function of electrical and instrumentation equipment and devices.
 - b. Precise routing and locations of underground conduits, pullboxes, junction boxes, and appurtenances that make-up the raceway system.
 - c. Show the dimensions, location and routing of electrical work, which will become permanently concealed.
 - d. Show complete routing and sizing of any significant revisions to the systems shown.
9. Prior to acceptance of the work, the Contractor shall deliver to the Engineer one set of record full size drawings neatly marked accurately showing the information required above.

1.07 COORDINATION

- A. The Contractor shall coordinate the electrical work with the other trades, code authorities, utilities, and the Engineer; with due regard to their work, towards promotion of a rapid completion of the project. If any cooperative work must be altered due to lack of proper supervision of such, or failure to make proper provisions, then the Contractor shall bear expense of such changes as necessary to be made in the work of others.
- B. Manufacturer's directions and instructions shall be followed in all cases where such is not shown on the Contract Drawings or herein specified.
- C. The electrical and instrumentation modifications and additions are to be made at facilities that need to remain powered at all times. The Contractor shall schedule all the required work with the Owner, including each shutdown period. Each shutdown shall be implemented to minimize disruption of the existing operations. Shutdowns may be required outside of normal working hours when necessary. The work to be provided under this Contract shall not disrupt any of the existing operations without prior approval.

1. The Contractor shall limit all scheduled shutdown periods to less than 2 hours (120 minutes) and only with prior approval of the Owner.
 2. Carry out scheduled shut downs only after the time, date, and sequence of work proposed to be accomplished during shutdown has been favorably reviewed by the Owner. Submit shutdown schedule and plans at least 10 working days in advance of when the scheduled shutdown is to occur.
 3. Contractor shall make provisions for portable generators and automatic transfer switches when facilities will be without power.
 4. The Owner reserves the right to delay, change, or modify any shutdown at any time, at no additional cost to the Owner, when the risk of such a shutdown would jeopardize the operation of system.
 5. Contractor is advised that during change out of existing MCCs, meter/main, pumps, demolition of existing conduits, installation of new conduits, etc., Contractor is responsible to keep equipment running for all necessary station operation. The Contractor shall install temporary generators, motor controls, panelboards, power panelboards, wiring, etc. to keep all facility equipment powered and automatic controls functional.
- D. Contractor shall be responsible for obtaining utility Engineered Drawings for service conductor conduits, pull boxes, wire size requirements, pull rope requirements, etc. Conflicts between the Contract Drawings and the utility engineered drawings shall be brought to the attention of the Engineer.
- E. The Contractor shall cease work at any particular point, temporarily, and transfer his operations to such portions of work as directed, when in the judgment of the Owner it is necessary to do so.
- F. Prior to commencing construction, the General Contractor shall arrange a conference with the General Contractor, Electrical Contractor, System Supplier, Resident Engineer & Owner as well as all equipment and system suppliers vital to the current phase of work. During the meeting, the equipment supplier shall verify types, sizes, locations, installation requirements, controls and diagrams of all equipment furnished. The Equipment and System Suppliers shall, in writing, inform the Engineer that all phases of coordination of this equipment have been covered and if there are any unusual conditions, they shall be enumerated at this time.
- G. It is the responsibility of the Contractor to make all equipment approval arrangements and scheduling with the power utility company connected with this project. Schedule within 30 days after award of contract all service installations and connections with the power and telephone utility. Lack of effort by the Contractor to properly schedule Utility service will not be considered valid justification for delays in project completion and no extension in contract time will be given.

- H. The Contractor shall coordinate with Owner, witnessing Engineer and System Supplier to test the entire system.
 - 1. No passwords shall be enabled on software or hardware developed for this project. All electronic disk copies provided to Owner shall not have any password protection enabled on them or the software. Software submitted with password protection will be removed by Owner and the Contractor will be back-charged for the cost thereof.

1.08 SUBMITTAL AND DRAWING REQUIREMENTS

A. General:

- 1. Submit shop documents and drawings for approval in accordance with this subsection and Section 01300.
- 2. Electrical submittals shall be submitted for favorable review by the Owner or Engineer per this subsection. They shall be complete giving all details of connections, wiring, instruments, enclosures, materials and dimensions. Standard sales literature will not be acceptable.
- 3. A copy of the appropriate Division Specification Sections, with addendum updates included and with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
 - a. Check marks (√) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated and, therefore, requested by the Contractor, each deviation shall be underlined and denoted by a unique number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the Specifications.
 - b. The submittal shall be accompanied by a detailed, written justification for each numbered item explaining variance or non-compliance with specifications.
 - c. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no review.
- 4. The Contractor shall coordinate submittals and required meetings with the work, panel fabrication and factory tests so that project will not be delayed. This coordination shall include scheduling the different categories of submittal, so that one will not be delayed for lack of coordination with another.
- 5. No material or equipment shall be allowed at the job site until the submittal for such items has been reviewed by the Engineer and marked “No Exceptions Taken” or “Make Corrections Noted.”

6. The equipment specifications have prepared on the basis of the equipment first named in the Specifications. The Supplier shall note that the second named equipment, if given, is considered acceptable and equal equipment, but in some cases additional design, options, or modifications may be required, at no additional cost, to meet Specifications.
 7. The decision of the Engineer governs what is acceptable as a substitution. If the Engineer considers it necessary, tests to determine equality of the proposed substitution shall be made, at the Contractor's expense, by an unbiased laboratory that is satisfactory to the Engineer.
 8. The Contractor shall cease work at any particular point, temporarily, and transfer his operations to such portions of work as directed, when in the judgment of the Engineer it is necessary to do so.
 9. No submittal documents shall be labeled as proprietary. Labeling documents as proprietary will be sufficient cause for rejection of entire submittal. The Owner reserves the right to copy or duplicate any and all portions of the documents provided for the project including copyrighted documents as desired.
 10. Approval of submittals shall not relieve Contractor of their obligation to perform the work in strict accordance with this Contract and the Contract Documents or of their responsibility to provide a complete and reliable system.
 11. Identify all submittals by submittal number on letter of transmittal. Submittals shall be numbered consecutively and resubmittals shall have a letter suffix. For example:
 - a. 1st submittal: 1
 - b. 1st resubmittal: 1A
 - c. 2nd resubmittal: 1B, etc.
- B. The electrical submittals shall include but not be limited to data sheets and drawings for each product together with the technical bulletin or brochure. No FAX copies of documents are allowed. Color copies shall be provided when black and white copies do not show adequate clarity. The electrical submittals shall include:
1. Product (item) name used herein and on the Contract Drawings.
 2. The manufacturer's model or other designation.
 3. Tag name/number per the P&ID drawings, schedules, and indexes.
 4. Index Binder Tab Dividers.
 5. Detailed electrical one line, elementary control diagrams and interconnection diagrams showing all wiring requirements for each system.
 6. Complete documentation with full description of operation.

7. Complete catalog cuts with full description of equipment. General sales literature will not be acceptable. The part or model number with options to be provided shall be clearly identified. Where more than one item or catalog number appears on a catalog cut, the specific item(s) or catalog numbers(s) proposed shall be clearly identified.
8. Location of assembly at which it is installed.
9. Input-output characteristics.
10. Range, size and graduations as required.
11. Physical size with dimensions and mounting details. System Supplier submit a letter listing all instrumentation pipe sizes, pipe connections, flange types, and ANSI ratings signed by Contractor and System Supplier to certify coordination for proper installation prior to flow elements being purchased.
12. Enclosure fabrication and color.
13. Enclosure layout and elevation drawings to scale.
14. Quantity and quality requirements for electric power.
15. Materials of construction of components.
16. Nameplate schedule.
17. Interconnection diagrams.
18. Failure to provide submittals with heavy duty permanent plastic labeled index tabs may be grounds for immediate rejection without review.
19. Bill of Materials: A complete Bill of Materials list shall be provided at the inside of the front cover. The Contractor shall provide Bill of Material for electrical components formatted as shown in Appendix "A". A separate set of Material Listing forms shall be provided for the MCC, spare parts, and another listing all field equipment. Generic names or part numbers used by a distributor or Systems House are not acceptable; originating manufacturer's name and part number shall be listed.
20. A separate instrument data sheet shall be provided for each instrument per ISA S20 standards or approved equal. Data sheets shall be printed on blue or pink paper. Provide an index with proper identification and cross-referencing of each data sheet.
21. Submit USB electronic copies of all submitted drawing in AutoCAD format.
22. For each resubmittal, provide a copy of submittal comments and a separate letter, on Company letterhead, identifying how each submittal comment has been addressed in the resubmittal.
23. Electronic PDF version of submittals shall follow hard copy format of submittal and shall be "bookmarked" at each index, subtab, copy of

appropriate check-marked Specification Section, bill of materials, copy of submittal comments (for resubmittals), Contractor's response to submittal comments (for resubmittals), drawings, etc. Failure to bookmark PDF may be grounds for immediate rejection without review.

24. Submittal Drawings shall be provided in 11 inch by 17 inch hardcopy format.
 25. Electronic submissions of submittals may be provided for submittals less than 80 pages and without drawings. Submittals equal to or over 80 pages or those that contain drawings shall be provided in a hardcopy format. Drawings shall be printed at 11 inches by 17 inches. Hardcopy submittals shall be provided in binders as specified herein. The Owner reserves the right to reject submittals that fail to be organized as described herein.
- C. All drawings shall be generated with a computer utilizing the AutoCAD drafting package. Standard preprinted drawings simply marked to indicate applicability to the Contract will not be acceptable. Drawings shall be prepared in a professional manner and shall have borders and a title block identifying the project, system, drawing number, drawing title, AutoCAD file name, project engineer, date, revisions, and type of drawing. Drawings shall be no smaller than 11" x 17" and printed with a laser jet printer or plotted in ink on vellum. The lettering shall be legible and no smaller than 0.075 inch in height. Diagrams shall carry a uniform and coordinated set of wire colors, wire numbers, and terminal block numbers. A Drawing Index shall be provided that lists each Drawing title and drawing number. Each Drawing title and number shall be unique. The index shall not include drawings listed as "This Page Intentionally Left Blank". The shop drawings shall include:
1. Electrical one or three line diagrams detailing all devices associated with the power distribution system. The following applicable information or data shall be shown on the one- or three- line diagram: location, size and amperage rating of bus; size and amperage rating of wire or cable; breaker ratings, number of poles, and frame sizes; generator; automatic transfer switch; utility metering; voltage; amperage; number of wires and phases; fault interrupt ratings; ground size and connections; neutral size and connections; power fail and other protective devices; fuse size and type; panelboard; starters; contactor size and overload range; motor full load amperage of submitted motor and horsepower; rating for miscellaneous loads; etc. Submit equipment motor voltage, phase and full load amps provided for this project for verification of accuracy of submitted one line drawings.
 2. Elementary diagrams shall be provided for all relay logic, power supplies, PLC I/O and other wiring. All elementary diagrams shall be drawn in JIC EMP/EGP format and standards similar to those shown on the E-series elementary diagrams showing ladder rung numbers and coil and contact cross referencing numbers.

3. Enclosure and Elevation layout diagrams shall be provided to show all deadfront, front panel and backpan devices drawn to scale. Show fabrication methods and details; including material of construction, paint color, support and latching mechanisms, fans and ventilation system, and conduit entrance areas.
4. Interconnection diagrams shall show for each piece of equipment all wiring between all devices, panels, cabinets, terminal boxes, control equipment, motor control centers and any other devices and equipment. An interconnection diagram shall be furnished for each electrical and instrumentation system, even if one was not shown explicitly on the Contract Drawings even if they are not provided by the System Supplier. Interconnection diagrams shall be prepared for all conduits listed in the Conduit and Wire Routing Schedule. Each interconnection diagram shall show the following as a minimum:
 - a. Interconnect drawings shall be prepared for all equipment by the System Supplier.
 - b. The diagrams shall be utilized by the electrician during all phases of installation and connection of all conductors to ensure coordination of equipment interconnect.
 - c. The diagrams shall show wiring as field labeled at the end of the project when as-builts are submitted.
 - d. Each wire labeling code as actually installed shall be shown. The wiring labeling code for each end of the same wire must be identical.
 - e. All devices and equipment labeling codes shall be shown.
 - f. All Interconnection wires listed in the Conduit and Wire Routing Schedule for each conduit shall be shown only on one interconnect drawing. Interconnection diagrams shall be of the continuous line type with identified lines. Diagrams of the wireless or wire schedule type are not acceptable. Bundled wires shall be shown as a single line with the direction of entry/exit of individual wires clearly shown.
 - g. All terminations points on the diagram shall be shown with the actual equipment identification terminal number or letter. This identification of terminations includes terminal blocks, junction boxes, all devices, computer I/O points, etc. “??” in lieu of terminal number is unacceptable.
 - h. Diagrams shall include raceway numbers, raceway size, raceway type, cable numbers, wire color code, and wire numbers.
 - i. Each wire size, and cable size and color code shall be shown. Each conduit with the conduit label and conduit size and wire fill shall be shown. Wire and cable routing through conduits, wireways, manholes, handholes, junction boxes, terminal boxes and other electrical enclosures shall be shown with the appropriate equipment

labels. All spare wires, cable, and termination points shall be shown. Cable shields shall be shown.

- j. Labeling codes for terminal blocks, terminals, wires, cables, panels, cabinets, instruments, devices, and equipment shall be shown. Place “øA,” “øB,” and “øC” label next to each breaker to identify phase connected to.
- k. Schematic symbols shall be used for field devices, showing electrical contacts. Signal and DC circuit polarities shall be shown.
- l. The diagrams shall show all other Contract and Supplier drawing numbers, for reference, that are associated with each device that is interconnected. Attached to each interconnect, a copy of all the support documents used in preparing interconnects shall be submitted. This includes current issues of panel schematics, elementary diagrams, panelboard schedules, conduit schedules, one-line diagrams, connection diagrams, terminal block diagrams, submittals, contract drawings, vendor drawings and all other data used to develop the interconnection diagram as noted in the “Reference Documents” corner of Interconnect Drawings.
- m. Interconnects shall include list of all applicable reference drawings, request for clarifications, field instructions and change orders. All deletions and additions of equipment, wire and cables shall be clearly shown.
- n. Field wiring shall not start before the Interconnection Drawing has been submitted by the Contractor and approved by the Owner.
- o. Do not show the same wires or jumpers, or panel wiring on both the connection and interconnection diagrams. All jumper, shielding, and grounding termination details not shown on the connection diagrams shall be shown on the interconnection diagrams.
- p. Interconnection diagrams shall be submitted and approved by Owner for each electrical and instrumentation system. The Contractor shall not pull in any wires into conduits that do not have approved interconnects. If the Contractor pulls in wire without Owner approval of associated Interconnect Drawings, the Contractor will not be reimbursed for labor for re-pulling in wires even if there was an error in wire fill or sizing. Also, if the Contractor pulls in wire without Owner approval of associated Interconnect Drawings, then all progress payments related to field wiring for that particular area of work will be withheld until approved Interconnect Drawings are in use.
- q. All interconnection diagrams shall be prepared by a System Supplier under the supervision of or by a State of California Registered Electrical Engineer and shall bear that Engineer’s professional stamp and signature for all Interconnection Drawings submitted for approval including as-builts and those used in the field installation.

- r. Example format of Interconnection diagram is shown on Contract “E” Series Drawings or may be obtained from the Engineer.
- s. Interconnect drawings submitted with wiring of a single conduit run separated onto multiple interconnect drawings will be rejected without review. A single conduit run with wiring shown on separate interconnect drawings will be allowed only after written approval is given by the Engineer for each conduit run prior to submitting the associated interconnect drawings.
- t. Only field wiring between MCC, Panelboards, Control Panels, and other electrical and instrumentation devices or equipment shall be shown on interconnection drawings. No internal panel wiring shall be shown on interconnect drawings except jumper or other wiring to be installed in field by Electrical Contractor.
- u. Interconnect Drawings along with the corresponding support documents shall be submitted in a separate submittal package. Interconnect drawings submitted with non-interconnect drawing packages will be rejected.
- v. Interconnect drawings shall be prepared for all equipment by the System Supplier with the exception of the Telephone System and Security Alarm System who shall produce their own interconnect drawings.
- w. Provide a notes section on each interconnect drawing. In the note section, list any variances from the Contract conduit schedule necessary for completing the interconnections. Change orders regarding wire fill, conduit schedule and errors in plans regarding conduits and wires will not be processed until interconnect drawings have been received for such work.
- x. The field electrician shall mark-up all interconnection diagrams during installation to show accurate as-built wiring, conduits runs, terminations, etc. If interconnection drawings are not properly as-built, the Electrical Contractor will have cost deducted from the Contract for the Owner to field verify and prepare as-built interconnection drawings amount. The amount of the deduction shall be determined on a time and material basis. The cost of such work shall be \$120.00 per hour plus expenses.
- y. The System Supplier shall be responsible to collect all information necessary to complete each interconnection drawing. This includes making field trips to collect all terminal connection data for new and existing, MCCs, switchboards, panelboards, instruments, equipment and electrical panels.
- z. An index of drawings shall be provided with each Interconnection submittal listing the unique drawing number and the description of the interconnect drawing (e.g. Drawing 4321-IC1004 Pump 1004 Interconnect Drawing).

- aa. Provide conduit and interconnect drawing cross reference indexes. Interconnect Conduit Index shall list all conduits listed in the Conduit & Wire Routing schedule and its associated Interconnection Drawing number. An Interconnection Drawing Index shall list all Interconnection drawings and the conduits shown on that specific drawing. These two indexes shall be at the front of all interconnection drawing submittals.
 - bb. Interconnection submittals that contain more than two motor control panels/centers shall have heavy duty dividers with permanent plastic labeled index tabs separating each group of drawings.
 5. Submit full size drawing of all nameplates and tags, as specified herein, to be used on project. The Engineer has the right to adjust nameplate engraving titles during submittals at no additional cost to the Owner. Submittal to include the following:
 - a. Dimensions of nameplate.
 - b. Exact lettering and font for each nameplate.
 - c. Color of nameplate.
 - d. Color of lettering.
 - e. Materials of construction.
 - f. Method and materials for attachment.
 - g. Drawing showing location of nameplates on each panel and enclosure.
 6. Copying contract drawings and providing them as submittals will be considered unresponsive and the submittal will be rejected without review.
- D. Each submittal shall be bound in a three ring binder, which is sized such that when all material is inserted the binder is not over 3/4 full. Binder construction shall allow easy removal of any page without complete manual disassembly; spiral ring type binders are not acceptable.
 1. Each binder shall be appropriately labeled on the outside spine & front cover with the project name, contract number, equipment supplier's name, specification section(s), and major material contained therein.
 2. An index shall be provided at the inside of the front cover. This index shall itemize the contents of each tab and subtab section. Also list the project name, contract number and equipment supplier's name, address, phone number, and contact person on the index page.
 3. Field equipment shop documents, panel equipment shop documents, drawings, and bill of materials shall be grouped under separate tabs. Catalog cuts shall be ordered in the same sequence as their corresponding Contract specification subsection.
 4. Catalog cuts shall be submitted grouped together by material and not scattered throughout the submittal intermingled with other material cut

- sheets (i.e. do not submit cut sheet for specific size conduit followed by cut sheet for specific size wire, and then cut sheet for different size conduit and different size wire. Group conduits together, group wires together, etc.)
5. All copies shall be clear and legible. Data sheets shall be provided for each instrument, with an index and proper identification and cross-referencing.
 6. Exceptions to the Contract specifications or drawings shall be clearly defined by the equipment supplier.
 - a. Data shall contain sufficient details so a proper evaluation may be made by the Engineer. Contractor shall provide separate letter (located in the front of the submittal) detailing specific exceptions to the Contract Specifications or Drawings.
 - b. Exceptions that are noted in the marked-up Drawings or Specifications, but not listed on the Exceptions/Clarifications letter, will be considered as non-responsive and not accepted as changes to the Contract Documents.
 7. Requests for information (RFIs) shall not be included in submittals. RFIs supplied with submittals will not be answered. RFIs shall be submitted following proper channels.
 8. Resubmittals shall be provided with a copy of the previous submittal comments and a separate letter, on company letterhead, identifying how each submittal comment has been addressed in the resubmittal.
 9. Drawings shall be submitted in a separate hole-punched binder that covers the entire 11" x 17" length of the Drawing:
 - a. Shop Drawings with less than 20 sheets total in the submittal, may be provided in an 11½-inch by 17½-inch reinforced folder.
 - b. All Interconnection Drawings or Shop Drawings of 20 sheets or more shall be provided in separate heavy duty three-ring binder to allow drawings to be easily removed. Binder shall be Cardinal D-Ring Easy Open Ledger Binder with locking D-Rings or approved equal.
 - c. Failure to provide drawing submittal in correct binder format may be grounds for immediate rejection without review.
 - d. Each drawing title block shall contain the English description name for drawing contents (i.e. Lift Pump No. 1 Interconnect Drawing) and drawing number. All pages and drawings in the submittal shall be numbered sequentially (with no number skipped) in lower right hand corner.
 - e. Drawings that are "C" or "D" size shall be folded, with the title block visible and placed in reinforced clear plastic pockets.
- E. Shop documents and drawings shall be submitted for all devices and components in the electrical system. The Contractor is notified that this is a "Fast Track" project

and all electrical & instrumentation drawings shall be submitted in a timely manner as not to delay completion of the project.

1.09 SUPERVISION

- A. The Contractor shall schedule all activities, manage all technical aspects of the project and attend all project meetings associated with this Section.
- B. The Contractor shall supervise all work in this Division, including the electrical system general construction work, from the beginning to completion and final acceptance.
- C. The Contractor shall supervise and coordinate all work in this Division to insure that each phase of the project, submittal, delivery, installation, and acceptance testing, etc., is completed within the allowable scheduled time frames.
- D. The Contractor shall be responsible for obtaining, preparing, completing, and furnishing all paper work for this Section, which shall include transmittals, submittal, forms, documents, manuals, instructions, and procedures.

1.10 INSPECTIONS

- A. All work or materials covered by the Contract documents shall be subject to inspection at any and all times by the Owner. If any material does not conform to the Contract documents, or does not have an “No Exceptions Taken” or “Make correction Noted” submittal status; then the Contractor shall, within three days after being notified by the Owner, remove the unacceptable material from the premises; and if said material has been installed, the entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the Contractor.
- B. The Contractor shall give the Owner 10 working days’ notice of the dates and time for inspection. Date of inspection shall be as agreed upon by both the Contractor and Owner.
- C. Work shall not be closed in or covered over before inspection and approval by the Owner. All costs associated with uncovering and making repairs where non-inspected work has been performed shall be borne by the Contractor.
- D. The Contractor shall cooperate with the Owner and provide assistance for the inspection of the electrical system under this Contract. The Electrical Contractor shall remove covers, provide access, operate equipment, and perform other reasonable work which, in the opinion of the Engineer, will be necessary to determine the quality and adequacy of the work.
- E. Before request for final inspection is made, the Contractor shall submit to the Owner in writing, a statement that the Contractor has made his own thorough

inspection of the entire project enumerating punch list items not complete and that the installation and testing is complete and in conformance with the requirements of this Division.

- F. The Owner may arrange for a facility inspection by Cal-OSHA Consultation Service at any time. The Contractor shall make the necessary corrections to bring all work in conformance with Cal-OSHA requirements, all at no additional cost to the Owner.
- G. Contractor will be Responsible for any Additional Cost for Overtime, Weekend Overtime or Differential Time, Expenses for Inspection of Defective Work that has to be re-inspected.

1.11 JOB CONDITIONS

- A. The Contractor shall make all arrangements and pay the costs thereof for temporary services required during construction of the project, such as temporary electrical power and telephone service. Upon completion of the project, remove all temporary services, equipment, material and wiring from each site as the property of the Contractor.
- B. The Contractor shall provide adequate protection for all equipment and materials during shipment, storage and construction. Equipment and materials shall be completely covered with two layers of plastic and set on cribbing six inches above grade so that they are protected from weather, wind, dust, water, or construction operations. Equipment shall not be stored outdoors without the approval of the Owner. Where equipment is stored or installed in moist areas, such as unheated buildings, provide an acceptable means to prevent moisture damage, such as a uniformly distributed heat source to prevent condensation.
- C. The elevation of the project site is shown on Contract Civil Drawings. All equipment shall be derated, as recommended by the manufacturer or in accordance with ANSI C37.30.
- D. The normal outdoor, not in direct sunlight, ambient temperature range of the job site will vary between 0 to 110 degrees Fahrenheit. All equipment shall be rated to operate in these temperature ranges or provisions for adequate heating and cooling shall be installed, at no additional cost to Owner. Provide air conditioning on outdoor electrical panels with heat sensitive equipment to meeting this requirement.
- E. The jobsite is prone to vandalism and theft. Contractor shall be responsible for securing all materials and equipment against theft and vandalism for the duration of the project.
- F. Contractor & Subcontractors shall utilize temporary services during construction of the project. No Contractors shall utilize building power, receptacles, etc. during construction.

1.12 MEASUREMENT AND PAYMENT

- A. No measurement will be made. Full compensation for conforming to these requirements, including all the labor, materials, tools, equipment, incidentals and for doing all the work involved in this section necessary for completion of the work, as shown on the Contract Plans, as specified in the Standard Specifications, these special provisions and as directed by the Engineer, shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed.

1.13 CHANGE ORDER PRICING

- A. All change order pricing by Contractor or System Supplier shall be broken out into the following minimum categories:
 - 1. Labor per hour listed per discipline, i.e. Engineer, Drafter, Estimator, Programmer, Secretarial, etc.
 - 2. Materials and equipment itemized per component and quantity.
 - 3. Rentals, travel, per Diem, etc.
 - 4. Tax.
 - 5. Shipping.
 - 6. Overhead and profit.
- B. Lump sum change order pricing is not acceptable.
- C. If Contractor or System Supplier refuse to provide a change order with broken out pricing, the Engineer reserves the right to obtain independent estimates from other Contractors or System Suppliers. The Contractor or System Supplier who refused to provide the change order with broken out pricing, will be charged for the preparation of the independent estimates.

PART 2 - MATERIALS

2.01 QUALITY

- A. It is the intent of the Contract specifications and drawings to secure the highest quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product.
- B. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed and braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble free service. Light duty, fragile and competitive grade devices of doubtful durability shall not be used.
- C. Products that are specified by manufacturer, trade name or catalog number established a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are favorably reviewed by the Engineer prior to installation.
- D. Underwriters Laboratories (UL) listing is required for all substituted equipment when such a listing is available for the first named equipment.
- E. When required by the Contract specifications or requested by the Engineer, the Contractor shall submit equipment or material samples for test or evaluation. The samples shall be furnished with information as to their source and prepared in such quantities and sizes as may be required for proper examination and tests, with all freight and charges prepaid. All samples shall be submitted before shipment of the equipment or material to the job site and in ample time to permit the making of proper tests, analyses, examinations, rejections, and resubmissions before incorporated into the work.
- F. All equipment shall be designed and constructed so that in the event of a power interruption, the equipment specified hereunder shall resume normal operation without manual resetting or operator interaction when power is restored.
- G. Signal transmission from remote or field electric and electronic devices shall be 4-20 mA, sourced by a 24 VDC loop supply from the panel that is to receive the signal. Nonstandard transmission methods such as impulse duration, pulse rate, and voltage regulated will not be permitted except where specifically noted.

- H. Outputs of equipment that are not of the standard signals as outlined, shall have the output immediately raised and/or converted to compatible standard signals for remote transmission.
- I. It is the System Supplier's responsibility to visit jobsite to collect and document existing conditions and equipment device part numbers in order for all similar called out new equipment to match existing.

2.02 NAMEPLATES AND TAGS

- A. EQUIPMENT EXTERIOR NAMEPLATES: Nameplate material shall be rigid laminated black phenolic with beveled edges and white lettering, except for caution, warning, and danger nameplates the color shall be red with white lettering. The size of the nameplate shall be as shown on the Drawings. No letters are allowed smaller than 3/16". All phenolic nameplates located outdoors shall be UV resistant. Securely fasten nameplates in place using two 316 stainless steel screws if the nameplate is not an integral part of the device. Epoxy cement or glued on nameplates will not be acceptable.
 - 1. Each major piece of electrical equipment shall have a manufacturer's nameplate showing the Contract specified name and number designation, the manufacturer's name, model designation, part number, serial number, and pertinent ratings such as voltage, amperage, # of phases, range, calibration, etc.
 - 2. For each device with a specific identity (pushbutton, indicator, field control station, disconnect switches, etc.) mounted on the exterior or deadfront of a piece of equipment, provide a nameplate with the inscription as shown in the Contract Documents. Where no inscription is indicated in the Contract Documents, furnish nameplates with an appropriate inscription providing the name and number of device.
 - 3. For all receptacles and switches (including devices located on Switchboard or MCC), provide a faceplate engraved or stamped with the panelboard and circuit number it is fed from. Also, include on faceplate or on a separate nameplate for each light switch identification use such as "OUTSIDE BUILDING LIGHTS," "PERIMETER LIGHTS," "MCC ROOM," etc.
 - 4. All field instruments and devices shall be labeled with designation shown on P&ID diagrams.
 - 5. All transformers and panelboards shall have nameplates with 1/2" high letters and be engraved with designations as shown on one-line Drawings.
 - 6. All safety and disconnect switches shall have nameplates with 1/2" high letters and be engraved with designations as shown on one-line drawings.
 - 7. Underground Pull Box and Vault Cover Identification: Engrave or bead weld pull box covers with minimum 1/4" thickness and 1/2" letters and

covers shall be engraved with designations, as shown on Contract drawings or as directed by Owner.

8. Aboveground Pull Box Cover Identification: 316 stainless steel screws attached stamped 316 stainless steel plate nameplates with 1/2" letters and be engraved with designations as shown on Contract drawings or as directed by Owner.
 9. Provide engraved nameplate at service entrance equipment (red with white lettering) indicating type and location of standby generator per NEC 702.7 (A).
 10. Provide engraved nameplate at service entrance equipment per NEC 702.7(B).
 11. METERING – Service Equipment Label: Per NEC 110.24 (A) Service equipment shall be legibly marked in field with the maximum available fault current. Field marking shall include date the fault current calculation was performed and be weather & UV rated. Service equipment shall not be hand labeled.
 12. All subpanels shall be identified with an engraved phenolic label of the power source location feeding it (i.e. MCC-100, Panelboard LP-1, etc.)
 13. Generator receptacles and generator lug panels shall have engraved nameplate with 1" letters (red with white lettering) per NEC 702.7.(C)
 14. Specific equipment fed from more than one feeder shall be properly identified ("Fed from Pedestal and the standby generator").
- B. EQUIPMENT INTERIOR NAMEPLATES: Nameplate material shall be white plastic with black machine printed lettering as produced by a KROY or similar machine; except caution, warning, and danger nameplates shall have red lettering.
1. The size of the nameplate tape shall be no smaller than 1/2" in height with 3/8" lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on a clean surface using the adhesion of the tape. Add additional clear adhesive to hold the nameplate securely in place when necessary.
 2. For each device with a specific identity (relay, module, power supply, fuse, terminal block, etc.) mounted in the interior of a piece of equipment provide a nameplate located above the device with the inscription as shown in the Contract Documents. Where no inscription is indicated in the Contract documents, furnish nameplates with an appropriate inscription providing the name and number of device used on the Submittal Drawings. Stamp the nameplates with the inscriptions as approved by the Engineer in the submittal.
 3. Nameplates shall not be attached to wireway covers or to removable devices.

4. For all receptacles and switches (including devices located in Control Panel, provide a faceplate printed with the panelboard and circuit number it is fed from.
- C. **EQUIPMENT TAGS:** The Contractor shall attach a tag to the equipment (including instruments) with the same inscriptions as specified above in paragraph A. The tag shall be made from 316 stainless steel material and the size of the nameplate shall be no smaller than 3/8”h x 2”w with 3/16” machine printed or engraved lettering unless otherwise approved by the Engineer. The tag shall be attached to the equipment with 316 stainless steel wire of the type normally used for this purpose. SST wire must be crimp connected. Twisting ends together is not acceptable.
- D. Engrave or machine print the tags with inscriptions as approved by the Engineer in the nameplate submittal.
- E. Provide temporary labels for all instruments and devices immediately when installed. Temporary labels shall be provided with 1/2” letters minimum and labeled with P&ID tag number.

2.03 WIRE

- A. This Section applies to all wires or conductors used internal for all electrical equipment or external for field wiring. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.
- B. **Material:** Wire shall be new, plainly marked with UL label, gauge, voltage, type of insulation, and manufacturer’s name. All wire shall conform to the following:
 1. Conductors shall be copper, with a minimum of 97% conductivity.
 2. Wire shall be Class B stranded. Solid wire conductor prohibited.
 3. ASTM B8, soft drawn copper, maximum 12 months old.
 4. Insulation of all conductors and cables shall be rated 600 volt.
 5. Insulation type for all conductors shall be moisture and heat resistant thermoplastic NEC Type XHHW-, rated 90 °C in dry locations and 75 °C in wet locations, or approved equal.
 6. Field wire minimum AWG sizes
 - a. #12 for wires used for individual conductor circuits 480 volt and above. #12 for wires used for individual conductor circuits 100 volt and above, except for PLC I/O which may be #14 AWG.
 - b. #14 for wires used for individual conductor circuits below 100 volt.
 7. Non-field or panel wire minimum AWG sizes if properly protected by fuse or breaker:
 - a. #14 for wires used for individual conductor circuits 100 volt and above.

- b. #18 for wires used for individual conductor circuits below 100 volt and above if properly protected by fuse or breaker.

8. Instrument Wiring

- a. Field: Instrument cables shall have 600V tray cable rated insulation and 100% individual shielded twisted pair #16 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) Cables shall be Belden, Manhattan, or approved equal.
- b. Non-Field: Instrument cables shall have 300V rated insulation and 100% individual shielded twisted pair #18 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) cables shall be Belden, Manhattan, or approved equal.
- c. General: Instrument cables shall have 600V rated insulation and 100% individual shielded twisted pair #16 conductors with drain wire. Single twisted shielded pair (T.S.P.R.) cables shall be Belden, or approved equal.

C. Wire Marking

- 1. Wire Identification: All wire terminations including field interconnect as well as wiring interior MCC cubicles, switchboard, panels, equipment, junction panels and boxes shall be identified with machine printed labels. Hand lettered labels are not acceptable and shall be replaced at the Contractor's expense. The wire identification code for all field interconnect and panel interior wiring, shall be similar to the designations shown on the Contract example drawings.
- 2. Wire Labels: The labels shall be machine printed with indelible ink, heat-shrink type, capable of accepting a minimum of 23 machine printed characters per sleeve, label by Brady "Bradysleeve" or equal. Labeling shall be neatly installed for visibility and shall be clearly legible. Each wire and conductor shall be labeled with wire label, as shown on approved loop, elementary and interconnect Drawings. Labels shall not be wrap-around or Snap-On type.
- 3. Where there is insufficient space for labels on locally interconnected neutral wires such as jumpers between adjacent auxiliary relay coil neutral terminals, these labels may be omitted. "Locally" is defined as wires no longer than 8".
- 4. Wire labels for lighting and receptacles shall be installed and consist of the panelboard and circuit number (i.e., Panelboard "LP100," circuit breaker #3 would have wire label line "LP100-L3" and neutral "LP100-N3").
- 5. All spare wires shall be labeled with equipment number followed by X1, X2, etc. (i.e. P11001-X1 for first spare wire).
- 6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.

7. Ethernet patch cables and fiber cables shall be labeled with primary devices it is connected to (i.e. “PLC,” “OI,” “PLC-2,” etc.). Label shall be white plastic with black machine printed lettering as produced by a KROY or similar machine with lettering no smaller than 3/8”. Securely attach to cable with clear tape.

D. Special Purpose Wiring

1. Manufacturer Supplied Cables (MNFR CBL): Cables and wiring for special systems shall be provided by the manufacturer with the equipment and installed per the manufacturer’s recommendations.

E. Color Code

1. Color code of all wire shall conform with the following table.

WIRES COLOR CODE TABLE

Description	Phase/Code Letter	Field Wire or Tape Color	Non-Field Wire Color
480 V, 3 Phase	A	Brown	Brown
	B	Orange	Orange
	C	Yellow	Yellow
240 V or 208 V, 3P	A	Black	–
	B	Red (Orange if high leg)	–
	C	Blue	–
240 / 120 V, 1 P	L1	Black	Black
	L2	Red	–
12 V Positive	12P	Dark Blue	Dark Blue
12 V Negative	12N	Black/Red Stripe	Black/Red Stripe
24 V Positive	24P	Pink	Pink
24 V Negative	24N	Black Stripe	Black Stripe
AC Control		Violet	Red (Yellow for Foreign Circuits)
DC Control		Light Blue	Light Blue
Neutral	N	White	White
Ground	G	Green	Green
Shielded Pair	+	White (Clear)	White (Clear)
	–	Black	Black

2. No other colors shall be used without prior approval of the Owner.
3. The same color shall be connected to the same phase throughout the panel.
4. All wires shall be properly fused or protected by a breaker at the amperage rating allowed by the NEC.

5. Neutral used for AC Control shall be white.
6. Phase color insulation shall be provided for complete length of #8 wire or smaller, colored phase tape is not allowed on #8 and smaller wire.

2.04 TERMINAL BLOCKS & FUSES

A. Control Panel Terminal Blocks:

1. General

- a. Terminal blocks to be clamp type, 6mm spacing, 600 volt, minimum rating of 30 amps, and mounted on DIN rail, Phoenix Contact, Entrelec, or approved equal. DIN rail shall be same type as used for the relays. Install an extra DIN rail on each type of terminal strip with 20% spare terminals for future additions.
- b. Provide terminal blocks with "follower" plates that compress the wires and have wire guide tangs for ease of maintenance. Terminal blocks that compress the wires with direct screw compression are unacceptable. All power, control and instrument wires entering and leaving a compartment shall terminate on terminal blocks with wire numbers on terminals and on both ends of the wires.
- c. Terminal Tags and Markers: Each terminal strip shall have a unique identifying alphanumeric code at one end. Numbers shall be assigned to all blocks except grounding blocks. Fuse blocks shall be assigned unique tag numbers such as FU1, FU2. No two fuses shall be assigned the same tag number. Terminal blocks are to be labeled to match the wire landed.
- d. Terminal blocks shall be physically separated into groups by the level of signal and voltage served. Power and control wiring above 100 volts shall have a separate group of terminal blocks from terminal blocks for wiring below 100 volts, intermixing of these two types of wiring on the same group of terminal blocks is not allowed.
- e. Provide a ground terminal or connection point for each grounding conductor.
- f. Provide a separate terminal block for every two neutral terminations or as coordinated with the interconnect diagrams.

2. MCC – Motor Starter Cubicles Terminal Blocks:

- a. MCC cubicle terminal blocks shall be pull-apart as supplied standard by MCC manufacturer.

3. Power Termination Blocks shall be rated for 600V main power connection. The power termination blocks shall be rated to accept Copper or Aluminum cable rated as shown on Contract one-line diagrams. The power termination block shall be capable of being mounted anywhere in a termination box. Each termination block shall be provided with lug shield to prevent contact

with power connections. The power termination blocks shall be Connectron or approved equal.

B. Fuses

1. Fuses used in circuits 200 VAC and above shall be time-delay type FNQ or approved equal, 13/32" x 1-1/2", and have an interrupting rating of 42,000 AIC at 500 VAC. Fuse holders shall be of the barrier type and rated 600 VAC.
2. Fuses used in 120 VAC shall be time-delay type MDL or approved equal, 1/4" x 1-1/4", and have a rating of 250 VAC. Fuse-holders shall be of the terminal block type.
3. Fuses used in signal and 24 VDC circuits shall be fast-acting type GMA or approved equal, 5 mm x 20 mm/1/4" x 1-1/4" and have a rating of 250 VAC. Fuse-holders shall be of the terminal-block type.
4. Fuses shall be sized in conformance with the NEC.

2.05 COMPONENTS

A. Switches and Pushbuttons

1. Switches and pushbuttons for general purpose applications shall be water and oil tight as defined by NEMA 4X, corrosion resistant as defined by NEMA ICS 6-110.58, U.L. listed, standard 30 mm diameter, with round plastic clamp ring. Switches shall be Allen-Bradley 800H or approved equal.
2. Switches and pushbuttons shall have contacts rated 10 amperes continuous and 600 VAC.
3. Manufacturer's standard size legend plates shall be provided and engraved to specify each switch and pushbutton function. The legend plate color shall be black.
4. Selector switch handles and pushbutton caps shall be black.
5. Selector Switch Positions
 - a. Hand-off-auto (HOA) applications shall have the hand position to the left, off in center, and auto in the right position.
 - b. On/Off shall have the ON position to the right.
 - c. Local/Remote shall have the REMOTE position to the right.
 - d. Open-Close-Auto applications shall have the open position to the left, close in center, and auto in the right position.
6. Potentiometer be 10kohm, manual single turn potentiometer.
7. Lockout stop shall be a pushbutton with red cap and pad locking assembly for pushbutton.

B. Relays and Timers

1. GENERAL: Relays and timers shall be provided with N.O. or N.C. contacts as shown on the Contract drawings. All spare contacts shown shall be provided. Contacts shall be rated 10 amps minimum at 120 VAC, 60 Hz unless otherwise stated. Supply power or coil voltage shall be 120 VAC unless shown otherwise on the Contract drawings. Relays and timers shall be designed for continuous duty. All relays shall be U.L. listed. The following is a summary of abbreviations associated with relays and timers:

CR	–	Control relay
TR	–	Timing relay
TDOE	–	Time delay on energization
TDOD	–	Time delay on de-energization

2. Control relays (CR) shall be plug-in type with indicating lights and clear see-through sealed or enclosed housing to exclude dust. Sockets for plug-in relays shall be standard industrial blade type with barrier pressure screw terminals. Provide IDEC Type RR, or approved equal. Two form-C contacts (minimum) shall be provided on each relay.
3. Time delay relays (TR) on energization or de-energization shall be solid state plug-in relays with a timer adjustable over the range 1 second to 3 minutes unless other ranges are indicated or required. Provide LED timer energized indicator lamp. Sockets for plug-in timers shall be standard industrial type with barriered pressure screw terminals. Time delay relays shall be IDEC GTS, or approved equal.

C. Indicating Lights

1. Indicating Lights for general purpose applications shall be water and oil tight as defined by NEMA 4X, corrosion resistant as defined by NEMA ICS 6-110.58, U.L. listed, High intensity multi-chip LEDs, full voltage (unless shown otherwise), standard 30 mm diameter, with round plastic lens and miniature bayonet lamp base. Indication lights shall be Allen-Bradley 800H, or approved equal.
2. Manufacturer's standard size legend plates shall be provided and engraved to specify each light's function. The legend plate color shall be black.
3. Indicating lights designated "PTT" shall be provided with a push-to-test switch and wiring.
4. Indicating light type and color of lens shall be as shown on the Drawings or specified in the Contract documents. Lamp color will be as follows:
 - a. Open/On Green
 - b. Closed/Off Red
 - c. Alarm Amber
 - d. Power On White

D. Circuit Breakers

1. Circuit breakers shall be of the indicating type, providing ON, OFF and TRIPPED positions of the operating handle. Circuit breakers shall be quick-make, quick-break, with a thermal-magnetic (TM) action or Motor Circuit Protectors (MCP) as shown on One-Line Diagrams. Circuit breakers feeding Soft Starters or VFDs shall have true adjustable long, short and instantaneous trip units.
2. Main Circuit breakers shall be the bolted on type. The use of tandem or dual circuit breakers in a normal single-pole space to provide the number of poles or spaces specified are not acceptable. All multiple-pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. Main Circuit breakers and motor circuit protectors shall be manufactured by Eaton, G.E., ITE, or approved equal.
3. Each 480 volt or 240V circuit breaker shall have a minimum interrupting capacity of 35,000 amperes. Each 120 volt breaker shall be rated for a minimum 10,000 amperes interrupting capacity. Breakers shall be sized as shown on Drawings and as necessary for the supplied equipment.
4. Fused disconnects shall not be used in place of breakers.
5. Breakers shall be sized and have a minimum interrupting capacity as shown on Drawings and as required for the supplied equipment.
6. All breakers shall be supplied with the correct sized copper only lugs for wire sizes as listed in "Conduit & Wire Routing Schedule". Provide larger frame breaker or lug adapters as necessary when connecting to the listed oversized wire.

2.06 CONTROL PANEL

- A. Control panel shall consist of the 24VDC power supply, enclosure, and other devices for a complete and operational system.
 1. City will obtain new backpan mounted RTU. Backpan spaces shall be made available inside Control Panel for its installation.
 - a. Programming, configuration and final terminations will be by Others.
 2. Devices:
 - a. Lights, switches, pushbuttons, terminal blocks etc. to match those specified under Devices subsection.
 - b. DC power supply to be VDC quantity and sizes per Contract drawings, Sola, Phoenix Contact, Power One Linear series, or approved equal.
 - c. RFI filter for radio interference protection shall be Corcom 15VK, or approved equal.

- B. Provide metal data pocket within each enclosure to hold as-built drawings.

2.07 FIELD DEVICES

A. Level/Pressure Indicating Transmitter (0-30 feet, LIT-151)

1. Transmitter:

- a. The pressure transmitter shall incorporate a high-accuracy capacitance sensor. With this sensor, process pressure is transmitted through the isolating diaphragm and fill fluid to the sensing diaphragm in the center of the capacitance cell. Capacitor plates on both sides of the sensing diaphragm detect its position. The differential capacitance between the sensing diaphragm and the capacitor plates shall be directly proportional to process pressure.
- b. The transmitter shall incorporate a temperature measurement to compensate for thermal effects.
- c. The pressure transmitter electronics shall convert the capacitance and temperature input signals directly into digital format for further processing by the electronics module.
- d. Configuration data shall be stored in nonvolatile EEPROM memory in the electronics module of the transmitter.

2. Software Functionality:

- a. The PC based HART protocol software and cables shall be provided.
- b. Configuration: The transmitter shall be configured by the System Supplier. Configuration shall consist of operational/parameters and informational data.
- c. Test: The pressure transmitter shall perform continuous self-tests.
- d. Format: The format function is used during the initial setup of a transmitter and for maintenance of the digital electronics.

Requirements: Range:	0-30 Feet.
Output:	Two-wire 4-20 mA output. Digital process variable superimposed on 4-20 mA signal.
Power Supply:	Loop power supply required.
Indication:	4-digit LCD meter setup with Engineering Units.
Zero Elevation and Suppression:	Anywhere within the sensor limits.
Overpressure Limits:	Limit is 0 psig to 3,626 psig (25 Mpa) without damage to the transmitter.
Temperature Limits:	Process: 0° F to 185°F (-18° C to 85°C). Ambient: -4° F to 175°F (-20° C to 80°C).
Humidity Limits:	0 – 100% relative humidity.

Requirements: Range: 0-30 Feet.
Accuracy: $\pm 0.075\%$ of span for spans from 1:1 to 10:1 of URL.
Stability: $\pm 0.2\%$ of URL for 12 months.
Process-Wetted Parts: Isolating Diaphragms: 316 SST.
Drain/Vent Valves: 316 SST.
Flanges: 316 SST.
Wetted O-rings: Glass-filled TFE.

3. The pressure transmitter shall be Foxboro IGP10-A22D transmitter, to match Owner Standard.
4. CALIBRATION VALVE - Each calibration valve assembly shall have integral 316 stainless steel block and bleed valving. Valve shall have a non-rotating tip stem and a fully back-seated bonnet. Block and bleed valve shall be Hex HB59 (phone 800-543-7311), PBM valve solutions or approved equal.

B. Intrusion Switch

1. Door Intrusion Switch ((ZS-191A, ZS191B) – Each intrusion door switch shall have a wide gap magnetic sensor with S.P.D.T. contacts mounted in a rugged steel housing with a 3 foot stainless steel armored cable for wiring to a junction box. Intrusion door switches shall be Sentrol 2507-A, or approved equal
2. Tank Intrusion switch (ZS-192A, ZS192B) – Each tank intrusion switch shall be pre-wired factory sealed cable for wet applications. Roller level switch shall have 316 stainless steel roller with 5' long rod lever arm. Switch shall be provided with two circuits with clockwise or counter clockwise lever movement operation. Intrusion switch shall be Siemens AG (3SE5112-0CH50) with lever or to match Owner Standard.

2.08 ELECTRICAL ENCLOSURES AND BOXES

- A. Enclosures and boxes to be wall mounted, minimum 14 gauge, type 316 stainless steel with seams continuously welded & ground smooth, and fast access door latches. A copper ground bus shall be provided in the enclosure. Outer door shall have provisions for locking enclosure with standard padlock. Provide white backpan in box.
- B. Provide accessories consisting of breaker to disconnect incoming power, heater, fan, removable metal louvers, and thermostats, where shown on Contract drawings.
- C. All fans, vents and louvers shall be provided with removable metal filters.
- D. Provide larger enclosure as required to accommodate the supplied equipment at no additional cost to the Owner.

- E. Provide metal data pocket within each enclosure and box to hold as-built drawings.
- F. All panel doors shall be installed with ground straps.
- G. Panels shall be provided with engraved nameplate identifying name of panel, voltage and location of power source feeding it (i.e. MCC-100, Panelboard LP-1, etc.).
- H. Enclosure shall be Hoffman, Circle AW or approved equal.

2.09 CONDUIT, RACEWAYS AND WIREWAYS

- A. General: Conduit, raceways, wireways, wiring methods, materials and installation shall meet all requirements of the NEC, be UL labeled for the application, and meet the minimum following specifications:
 - 1. All wiring shall be installed in conduits, raceways, or wireways when interconnecting equipment and devices.
 - 2. The Contractor shall use special conduit, raceways, wireways, construction methods, and materials as shown on the Contract drawings; which shall take precedence over any general methods and materials specified in this Section.
 - 3. The minimum size conduit shall be ¾-inch unless indicated otherwise on the Drawings or for special connections to equipment.
 - 4. Conduit stubs for future use shall be capped with coupling, nipple, plug, and cap and each end identified with conduit labels.
 - 5. Conduits to be abandoned that protrude above graded shall be cut flush and filled with grout.
 - 6. Conduits shall not be filled to more than 50% of their total cross-sectional area.
 - 7. Conduits entering enclosures shall be fitted with locknut and insulated grounding bushing; O-Z "HBLG," Appleton "GIB," or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
- B. Conduit Marking
 - 1. All conduits listed in the "Conduit and Wire Routing Schedule" shall have conduit tags at both ends of each conduit segment. This includes all conduits in pullboxes and vaults.
 - 2. Tag material shall be rigid laminated red phenolic with white lettering. The size of the tag shall be 2" diameter. No letters are allowed smaller than 7/16". Securely fasten tags in place using 316 stainless steel 0.048 inch diameter wire of the type normally used for this purpose (catalog cut sheet shall be submitted). Stainless steel wire shall be crimp connected. Twisting

ends together is not acceptable. Engrave the tags, on both sides, with the conduit number as listed in the Conduit and Wire Routing Schedule on the Contract "E"-series Drawings. Labeling shall be neatly installed for visibility and shall be clearly legible. Conduit tags shall be Brady Custom B-1, or approved equal.

3. Prior to encasement, concealment, backfilling of conduits, temporary conduit labels shall be provided at each end of conduit. Temporary conduit labels shall have ½-inch (minimum) lettering at all transition points. After encasement and concealment temporary conduit labels shall be placed at each exposed end.
4. Warning Tapes:
 - a. Bury detectable warning tapes approximately 12 inches above all underground conduit runs of two or more outside of building. Align parallel to and within 3 inches of the centerline of the conduit or duct bank.
 - b. Plastic tape shall be colored for particular underground service, 3-inch minimum width, utilize tape made of material resistant to corrosive soil. Tape shall have aluminum backing to facilitate locating it underground using a non-ferrous locator. Use red tape for "Electric" service and orange tape for "Communication" service. Use tape with printed wording listing type of service. Manufacturers and types: Seton, Blackburn, Griffolyn Co., Terra-Tape, Brady or equivalent.

C. Galvanized Rigid Steel Conduit (GRS)

1. Rigid steel conduit, couplings, bends and nipples shall be in accordance with ANSI C80.1 and UL-6.
2. Hotdip galvanized inside and outside after fabrication and then coated with a zinc bichromate finish.
3. Minimum trade size – three-quarters inch (¾") unless otherwise shown on Contract Drawings.
4. Conduits entering enclosures shall be fitted with locknut and insulated grounding bushing; O-Z "HBLG", Appleton "GIB", or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
5. Galvanized rigid steel factory elbows for indoor 90 degree transitions.
6. EMT or IMC is not considered an equivalent to GRS.
7. GRS conduit is allowed only when specifically called out in the "Conduit and Wire Routing Schedule".

D. Galvanized Rigid Steel Conduit – PVC Coated (GRS-PVC)

1. Standard weight, galvanized conduit with a 40-mil thick polyvinylchloride coating bonded to both the outside and urethane interior coating. Conduit shall be hot-dip galvanized conforming to NEMA RN 1. GRS-PVC conduit to be Robroy Plasti-bond Red, Perma-Cote, or approved equal.
2. Provide PVC coated galvanized rigid steel factory elbows for 90 degree transitions.
3. Fittings shall be hot dipped galvanized steel or galvanized cast ferrous metal with a PVC 40 mils thick coating. Provide threaded-type fittings, couplings, and connectors; set-screw type and compression-type are not acceptable. Fittings shall be Robroy Liquitite coated fittings or approved equal.
4. All junction boxes shall be galvanized with exterior surfaces PVC coated to 40 mils thickness except where 316 stainless steel boxes are called out.
5. Conduits entering enclosures shall be fitted with insulated grounding bushing; O-Z "HBLG", Appleton "GIB", or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
6. Support channel and pipe straps shall be PVC coated. Exposed metal/nuts, all-thread rod shall be 316 stainless steel.
7. PVC coating patching material shall be as provided by the manufacturer.
8. PVC coated Aluminum conduit is not acceptable.

E. PVC Conduit (PVC-40 OR PVC-80)

1. Shall be high impact polyvinylchloride suitable for use underground, direct burial and for use with 90 C wires, and shall conform to UL 651. PVC conduits shall be UL listed and labeled for "direct" burial.
2. A copper bonding conductor shall be pulled in each raceway and bonded to equipment at each end with approved lugs.
3. Bends, elbows, and risers shall be made with PVC coated galvanized rigid steel (GRS-PVC) conduit using threaded adapters. Bond each metallic portion to each other and to equipment connected at each end of conduit run.
4. Risers shall be made with PVC coated galvanized rigid steel (GRS-PVC) conduit using threaded adapters. Bond each metallic portion to each other and to equipment connected at each end of conduit run.
5. PVC fittings shall have watertight solvent-weld-type conduit connections.
6. PVC conduit shall be stored on a flat surface and shielded from the sun.
7. PVC conduit shall not be used above grade.
8. PVC coated Aluminum conduit is not acceptable.

- F. Liquid Tight Flexible Metal Conduit (FLEX)
 - 1. Minimum trade size one-half inch (1/2").
 - 2. All flex conduits shall be metallic with water tight outer jackets.
 - 3. Connectors:
 - a. NON-NEMA 12 AREA: PVC coated metallic with insulated bushings.
 - b. NEMA 12 AREA: Metallic with insulated bushings.
 - 4. Final connections to vibrating equipment such as motors and fans shall be made with flexible conduits.
 - 5. Flexible conduit lengths shall not be greater than 36 inches.
 - 6. Flexible metallic conduit shall not be considered as a ground conductor, install a separate wire for equipment bonding.
 - 7. Flexible conduit shall only be installed in exposed or accessible locations.
 - 8. Flexible conduits shall be used for conduit coupling to all vibrating and shifting equipment.

2.10 WIRING DEVICES

- A. Boxes
 - 1. Device boxes shall be of zinc-galvanized steel type with shape and size best suited for the particular application, rated for the location installed, and shall be supported directly to structure by means of screws, anchors, or bolts.
 - 2. Box dimensions shall be in accordance with size, quantity of conductors, and conduit clearances per NEC articles 314 requirements.
 - 3. Non-Weatherproof Boxes - Surface boxes shall be cast ferrous, deep FD type with threaded hubs.
 - 4. Weatherproof (WP) Boxes - PVC-coated cast ferrous boxes may be used in place of 316 stainless steel boxes, except where boxes contain devices on cover. Boxes shall be deep, FD type with threaded hubs or stainless steel with watertight Myers hubs. Single gang boxes shall have cast hubs.
- B. Switches
 - 1. General purpose switches shall be manufactured in accordance with UL 20. Switches shall be one pole rated, 20 amps, at 277 VAC. Bodies shall be of ivory phenolic compound supported by mounting strap having plaster ears. Switches shall have copper alloy contact arm with silver cadmium oxide contacts. Switches shall have slotted terminal screws and a separate green grounding screw. Furnish Hubbell 1221, Leviton 1221, or approved equal.

C. Receptacles

1. General purpose receptacles shall be duplex and rated 20 amps, 120 VAC, 2 pole, 3 wire grounding, NEMA 5-20R configuration, specification grade, and side wired to screw terminals. Face color shall be white or ivory. General purpose receptacles shall be Leviton 5362, Bryant, Hubbell, or approved equal.
2. GFI (ground fault circuit interrupting) receptacles shall be used in all boxes shown as weatherproof. GFI receptacles shall be duplex, 20A, 120V, with “test” and “reset” buttons with shallow design for mounting and standard screw terminals for direct wiring. Receptacles shall be designed, manufactured, and tested to prevent nuisance tripping from voltage spikes, RFI, EMI, or electronic component failures. Chaining multiple receptacles from one GFI unit is not acceptable. GFI receptacles shall be Leviton 6899, Arrow-Hart or approved equal.
3. Four in One receptacles (4 each 20A-125V receptacles in one housing, shall mount on a single gang box without additional adapters). Four in One receptacles shall be Leviton 21254, Hubbell, or approved equal.

D. Device Plates and Covers

1. General purpose device plates and covers shall be 316 stainless steel. Plates or covers shall be attached with 316 stainless steel screws. Circuit breaker number and panelboard name shall be stamped on each cover.
2. PVC coated device boxes shall have PVC-coated gasketed covers.
3. Weatherproof switch, outlet, and receptacle boxes shall be fitted with gasketed covers rated for wet locations in accordance with NEC 404.4.
4. Weatherproof switch, outlet, and receptacle boxes shall be fitted with cast aluminum gasketed cover rated for wet locations. Each receptacle access cover shall have a gasketed spring door to maintain the weatherproof integrity with plug inserted in accordance with NEC 406.9 for unattended locations. Final decision of type of access cover for specific location shall be per Engineer. Screws and hinge springs shall be 316 stainless steel. Receptacles located outside shall have tumbler key lock.
5. Weatherproof access covers shall be Hubbell, Crouse-Hinds, or TayMac Safety Outlet Enclosures, or approved equal.
6. Receptacle & light switch plates shall be stamped or engraved as specified in section Nameplates and Tags.

2.11 ANTENNA SYSTEM

- A. Each antenna system shall be furnished and installed complete and functional for the intended use. An antenna system shall include but not be limited to, antenna,

antenna pole, mounting hardware, lightning arrestor, and coaxial cables with connectors.

B. Antenna mast system shall meet the following specifications:

1. Antenna mast components shall be installed and supported as shown on the Contract Drawings. Support members shall have sufficient strength to withstand local wind conditions and shall be protected from sun exposure and corrosive chemical damage.
2. Support hardware such as clamps, orientation mounts, and offset brackets shall be steel protected with a hot dip galvanized finish or stainless steel. Clamps and mounts shall be heavy duty in order to transfer the full antenna load to the support tower or mast. Bolts and screws shall be stainless steel.
3. Antenna shall be Yagi Larson directional antenna, YA3450WN to match Owner Standard.
4. Transmission cable:
 - a. Provide 50 Ohm, 1/2-inch weatherproof coaxial cable from lightning arrestor to antenna. The coax cable shall have a corrugated outer conductor of multi-ply bonded Aluminum Tape, copper-clad aluminum inner conductor with foam dielectric. The coax cable shall be jacketed for corrosive environment and ultra-violet exposure. The coax cable shall be super flexible, with a minimum bending radius of 5 inches. The cable shall be installed as one continuous length from the antenna to the flange mounted lightning arrestor. Use Times Microwave Systems LMR400 1/2-inch coax cable, or approved equal.
 - b. A backpan mount antenna lightning "N" connector arrestor shall be furnished on the antenna coaxial transmission line. The lightning arrestor shall be grounded to the panel ground bus with a #8 AWG or larger bonding wire. The lightning arrestor shall be a PolyPhaser IS-50NX-C2 or approved equal.
 - c. Provide miscellaneous hardware such as grounding kits, hanger kits, and feed through assemblies.
 - d. The cable shall be carefully installed to prevent damage to the jacket and routed with a minimum bending radius of 8 inches.
 - e. Provide connector weatherproofing kits for outdoor exposed connectors and grounding strap attachments. All mating connectors that are exposed to weather shall be wrapped with a sealing material designed to protect against water and dirt entry into the connectors.

2.12 GROUNDING SYSTEM

- A. Ground clamps shall be bolt-on type as manufactured by ILSCO type AGC, O-Z Gedney Type GRC, Burndy Type GAR or GP or approved equal.
- B. All ground rod, pipe, and steel plate and buried bond connections shall be made by welding process equal to Cadweld.
- C. Ground buses shall be provided in all electrical enclosures. Each ground bus shall be sized as shown on the Contract drawings or specified herein. The ground bus shall be adequately sized for the connection of all grounding conductors required per NEC. Screw type lugs shall be provided on all ground busses for connection of grounding conductors.
- D. Each ground bus shall be copper. Screw type fasteners shall be provided on all ground busses for connection of grounding conductors. Ground bus shall be a Challenger GB series, ILSCO D-167 series or approved equal.
- E. Attachment of the grounding conductor to equipment or enclosures shall be by connectors specifically provided for grounding. Mounting, support, or bracing bolts shall not be used as an attachment point for ground conductors.
- F. All raceway systems, supports, enclosures, panels, and equipment housings shall be permanently and effectively grounded.
- G. One side of the secondary on all transformers shall be grounded.
- H. The system neutral (grounded conductor) shall be connected to the system's grounding conductor at only a single point in the system. This connection shall be made by a removable bonding jumper sized in accordance with the applicable provisions of the National Electrical Code if the size is not shown on the Drawings. The grounding of the system neutral shall be in the enclosure that houses the service entrance main over-current protection.
- I. The system neutral conductor and all equipment and devices required to be grounded by the National Electrical Code shall be grounded in a manner that satisfies the requirements of the National Code.
- J. Grounding conductors shall be sized as shown on the Plans or in accordance with NEC Table 250.122, whichever is larger.
- K. Grounding and bonding wires shall be installed on all conduits with grounding bushings, expansion joints and for continuity of raceways transitions. Bonding wires at endpoints shall be connected to enclosure ground bus or equipment grounding lug.
- L. Conduit grounding bushings and locknuts shall be installed on all metallic conduits. Conduit grounding bushings shall be set screw locking type electra-galvanized

malleable iron with insulation collar and shall be provided with a feed through compression lug for securing the ground bonding wire. Ground bonding wire shall be bare wire and shall be sized per NEC.

- M. All receptacles shall have their grounding contact connected to a grounding conductor.
- N. Branch circuit grounding conductors for receptacles, or other electrical loads shall be arranged such that the removal of a lighting fixture, receptacle, or other load does not interrupt the ground continuity to any other part of the circuit.
- O. Negative side of all VDC power supplies shall be grounded.

2.13 MANUAL TRANSFER SWITCH

- A. Provide manual transfer switch (MTS) with two 20A, 120VAC breakers; one for utility (UPS Power), one for generator. MTS shall have outdoor rated stainless steel cabinet with lockable cover. MTS shall be provided with built-in 120VAC receptacle. MTS shall be Reliance Controls Easy Tran CSR201 Series or approved equal.
- B. Provide adaptor plugs for City to plug in portable 120VAC generator.

2.14 ELECTRICAL ENCLOSURES AND BOXES

- A. Enclosures and boxes to be wall mounted, minimum 14 gauge, type 316 stainless steel with seams continuously welded & ground smooth, and fast access door latches. Outer door shall have provisions for locking enclosure with standard padlock. Provide white backpan in box.
- B. Provide accessories consisting of breaker to disconnect incoming power, heater, fan, removable metal louvers, and thermostats, where shown on Contract drawings.
- C. Provide larger enclosure as required to accommodate the supplied equipment at no additional cost to the Owner.
- D. A copper ground bus shall be provided in the enclosure. Each ground bus shall be copper and UL recognized. Screw type fasteners shall be provided on all ground buses for connection of grounding conductors. Ground bus shall have a minimum of 10 taps, and be rated for copper conductors. Ground bus shall be an ILSCO D-167 Series, or approved equal
- E. Provide metal data pocket within each enclosure and box to hold as-built drawings.
- F. All panel doors shall be installed with ground straps.

- G. Panels shall be provided with engraved nameplate identifying name of panel, voltage and location of power source feeding it (i.e. MCC-100, Panelboard LP-1, etc.).
- H. Top of operator interface (pilot devices / breaker) to be maximum 66" above finished floor.
- I. Enclosure shall be Hoffman, Tesco, Circle AW or approved equal.

PART 3 - MATERIALS

3.01 ELECTRICAL WORKMANSHIP

- A. All work in this Section shall conform to the codes and standards outlined herein.
- B. The Electrical Contractor shall employ personnel that are skilled and experienced in the installation and connection of all elements, equipment, devices, instruments, accessories, and assemblies. All installation labor shall be performed by qualified personnel who have had experience on similar projects. Provide first class workmanship for all installations.
- C. Ensure that all equipment and materials fit properly in their installations.
- D. Perform any required work to correct improper installations at no additional expense to the Owner.
- E. The Engineer reserves the right to halt any work that is found to be substandard or being installed by unqualified personnel.

3.02 ELECTRICAL CONSTRUCTION METHODS, GENERAL

- A. All wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by round-head 316 stainless screw attached retainer. Where space is available, such as in electrical cabinets, all wiring shall be run in slotted plastic wireways or channels with dust covers. Wireways or channels shall be sized such that the wire fill does not exceed 50%. Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wireways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles. Tie-wraps shall be T & B TY-RAP's or approved equal.
- B. Where wiring crosses hinged surfaces, provide a "U" shaped hinge loop protected by plastic spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections.
- C. All devices shall be permanently labeled and secured in accordance with subsections labeled "NAMEPLATES AND TAGS".
- D. All field wires and panel wires have wire markers as specified in the "WIRE" subsection.
- E. All components associated with a particular compartment's or enclosure's function shall be mounted in that compartment or enclosure.
- F. Spacing and clearance of components shall be in accordance with UL, JIC and NEC standards.

- G. Wires shall not be spliced except where shown. Devices with pigtails, except lighting fixtures, shall be connected at terminal blocks. Equipment delivered with spliced wires shall be rejected and the Contractor required to replace all such wiring, at no additional cost to the Owner.
- H. No wires shall be spliced without prior approval by the Engineer.
- I. Where splices are allowed or approved by the Engineer they shall conform with the following:
1. Splices of #10 and smaller, including fixture taps, shall be made with see-thru nylon self-insulated twist on wire joints; T & B “Piggys”, Ideal “Wing Nut”, or approved equal.
 2. Splices of #8 and larger shall be double crimped splices, or approved equal, insulated with heat shrink tubing, or approved equal.
 3. Splices in underground pullboxes shall be insulated and moisture sealed with 3M “Scotchcast” cast resin splice kits and shall have a date marking for shelf life. Do not use splice kits with a date marking for shelf life that has expired.
 4. Wire splicing devices shall be sized according to manufacturer’s recommendations.
 5. Tape on splices shall not be allowed.
 6. Splices for motor leads shall be made with T&B MSC series splice kit, or approved equal.
- J. Tapes shall conform to the requirements of UL 510 and be rated: 105 degrees C, 600V, flame retardant, hot and cold weather resistant. Vinyl plastic electrical tape shall be 7 mil black. Phase tape shall be 7 mil vinyl plastic, color coded as specified. Electrical insulation putty shall be rubber based, elastic putty in tape form. Varnished cambric shall not be used.
- K. Connections to terminals shall be as follows:
1. Use connector or socket type terminals furnished with component.
 2. Connections to binding post screw, stud or bolt use:
 - a. For #10 and smaller wire, T & B “Sta-Kon”, Buchanan “Termend” or approved equal, self-insulated locking forked tongue lug.
 - b. For #8 to #4/0 wire, T & B “Locktite”, Burndy QA or approved equal lug of shape best suited.
 3. Use ratchet type crimping tool which does not release until proper crimp pressure has been applied.
 4. Connections to terminals shall be as follows:
 - a. Use connector or socket type terminals furnished with component.

- b. Connections to binding post screw, stud, or bolt use:
 - 1) For #10 and smaller wire, T & B "Sta-Kon", Buchanan "Termend", or approved equal, self-insulated locking forked tongue lug.
 - 2) For #8 to #4/0 wire, T & B "Locktite", Burndy QA, or approved equal, lug of shape best suited.
 - c. Use ratchet type crimping tool which does not release until proper crimp pressure has been applied.
 - d. Connections for all terminals shall be made with insulation stripped per manufacturer's instructions.
- L. Equipment shall be wired and piped by the manufacturer or supplier. Major field modifications or changes are not allowed without the written "change order" authority by the Engineer. When field changes are made, the components, materials, wiring, labeling, and construction methods shall be identical to that of the original supplied equipment. Contractor's cost to replace or rework the equipment to match original manufacturer or supplier methods shall be done at no additional cost to the Owner.
- M. Mating fittings, bulkhead fittings, plugs, lugs, connectors, etc. required to field interface to the equipment and panels shall be provided by the supplier when the equipment is delivered.
- N. All electrical and instrumentation factory as-built drawings associated with the equipment shall be provided with the equipment when it is delivered to the job site. Drawings for each piece of equipment shall be placed in clear plastic packets of sufficient strength that will not tear or stretch from drawing removal and insertion.

3.03 ELECTRICAL EQUIPMENT FABRICATION, GENERAL

- A. Panel cutouts for devices (i.e. indicating lights, switches) shall be cut, punched, or drilled and smoothly finished with rounded edges. Exposed metal from cutouts that are made after the final paint finish has been applied shall be touched up with a matching paint prior to installing device. Do not paint nameplates, labels, tags, switches, receptacles, conductors, etc.
- B. All doors shall be fully gasketed, with non-shrinkable water and flame resistant material.
- C. Bolts and screws for mounting devices on doors shall be as specified by the manufacturer, otherwise they shall have a 316 stainless steel flush head which blends into the device or door surface. No bolt or screw holding nuts shall be used on the external surface of the door.
- D. No fastening devices shall project through the outer surfaces of equipment.

- E. Each component within the equipment shall be securely mounted on an interior subpanel or backpan and arranged for easy servicing, such that all adjustments and component removal can be accomplished without removing or disturbing other components. Mounting bolts and screws shall be front located for easy access and removal without special tools. Access behind the sub panel or backpan shall not be required for removing any component.
- F. **HARNESS:** Where space is available, all wiring shall be run in slotted plastic wire ways or channels with dust covers. If space is not available for wireways, then all wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by 316 stainless steel screw attached retainer. Wire ways or channels shall be sized such that the wire fill does not exceed 50%. Tie-wraps shall be T&B TY-RAP, or approved equal.
- G. **HINGE LOOPS:** Where wiring crosses hinged surfaces, provide a “U” shaped hinge loop protected by clear nylon spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections. Spiral wrap shall be Graybar T25N, or approved equal.
- H. **RETAINERS:** Wire ways, retainers, and other devices shall be screw mounted with round-head 316 stainless steel screws or mechanically mounted by push-in or snap-in attachments. Glue or sticky back attachment of any type or style shall not be used. Retainers shall be Panduit High Bond Adhesive back mounts SGABM series, or approved equal.
- I. **ROUTING:** Wires shall be routed in slotted plastic wire-ways with snap covers.
 - 1. Wires carrying 120 VAC shall be separated as much as possible from other low voltage wires and signal cables, and shall be routed only in ducts for 120 VAC. If the power wiring has to cross the signal wiring, the crossing shall be as close to a right angle as possible.
 - 2. Ducts for 24 VDC wiring shall be used for all other wires and cables. Routing of 120 VAC in combined ducts is not allowed without prior written approval of the Owner.
 - 3. Wires and cable shall be routed along the shortest route between termination points, excepting routes which would result in routing 120 VAC and other wires and cables in the same duct. Wires and cables shall have sufficient length to allow slack and to avoid any strain or tension in the wire or cable.
 - 4. Wires and cables shall be placed in the ducts in a straight, neat and organized fashion and shall not be kinked, tangled or twisted together. Additional wire ducting shall be provided for use by the electrical subcontractor for routing field wires to their landing points in the each electrical and instrumentation panel.

5. Wiring not routed in duct work shall be neatly bundled, treed, and laced with plastic ties. Wiring across door hinges shall be carefully made up and supported to avoid straining and chafing of the conductors or from putting any strain on their terminals.
- J. TERMINATIONS: Single wire and cable conductors shall be terminated according to the requirements of the terminal device. All terminations must be made at terminals or terminal blocks. Use of spring or buttsplice connectors are not allowed.
1. Provide 2" minimum separation between wireway and terminal blocks. Installation of wireways too close to terminal blocks will be required to be completely reworked to the satisfaction of the Owner.
 2. For captive screw pressure plate type terminals, the insulation shall be removed from the last 0.25 inches of the conductor. The conductors shall be inserted under the pressure plate to full length of the bare portion of the conductor and the pressure plate tightened without excess force. No more than two conductors shall be installed in a single terminal. All strands of the conductor shall be captured under the pressure plate.
 3. Terminal blocks and same equipment type termination wiring shall have all wiring terminated with appropriate sized ferrules with insulation collars. Ferrule crimping (full ratcheting) tool with proper sized jigs shall be used per manufacturer's recommendations.
 4. For screw terminals, appropriately sized locking forked spade lugs shall be used. Lugs shall be crimp on type that form gas tight connections. All crimping shall be done using a calibrated crimping tool made specifically for the lug type and size being crimped.
 5. On shielded cables, the drain wire shall be covered with insulating tubing along its full bare length between the cable jacket and the terminal lug or terminal pressure plate.
 6. For screwless terminals, wire shall be stripped back and inserted per the manufacturer's instructions. When stripping insulation from conductors, do not score or otherwise damage conductor.
 7. Heat shrink shall be placed on ends of shielded cable to cover foil.
 8. Additional condulets with terminal blocks shall be supplied for wire termination to devices with leads instead of terminals. (i.e., solenoid valves, level probe, etc.).
 9. Terminate all status, control, and analog I/O wiring on terminal blocks, including spares. Provide additional relay, DIN rails, terminal blocks and side panels as required.
- K. A ground bus shall be provided in each enclosure or cabinet. It shall have provisions for connecting a minimum of ten grounding conductors. Screw type lugs shall be provided for connection of grounding conductors. All grounding conductors shall

be sized as shown on plans or in accordance with NEC Table 250.122, whichever is larger.

- L. Minimum wire bending space at terminals and minimum width of wiring gutters shall comply with NEC Tables 373.6(A) & (B).
- M. Wire sizes shall not be installed smaller than those shown in NEC Article 310 for each circuit amperage rating.
- N. Future device and component mounting space shall be provided on the door, backpan, and subpanel where detailed on the Drawings. Where no detail is shown, provide a minimum of 15 percent usable future space.
- O. Doors shall swing freely a minimum of 90° and close with proper alignment.
- P. Provide larger motor termination boxes as required to accommodate conduit and wires.

3.04 DELIVERY

- A. Contractor shall inspect each electrical and instrumentation item delivered to the jobsite.
- B. Contractor shall unpack each item for inspection within two (2) days of arrival.
- C. Complete written inventory shall be produced by Contractor and submitted to Owner within (2) days after arrival on jobsite for record keeping prior to any payment for the item.
- D. All panels and enclosures be delivered with as-built drawings in clear plastic packets within each panel and enclosure.

3.05 DAMAGED PRODUCTS

- A. Damaged products will not be accepted. All damaged products shall be replaced with new products at no additional cost to the Owner.

3.06 FASTENERS & LUGS

- A. Fasteners for securing equipment shall be 316 stainless steel. The fastener size shall match equipment mounting holes. Layout to maintain headroom, neat mechanical appearance, and to support equipment loads required.
- B. All wire & cable lugs shall be copper; aluminum or aluminum alloy lugs shall not be used. The Electrical Contractor shall supply all lugs to match the quantity & size of wire listed in the Conduit & Wire Routing Schedule.

- C. Anchor Methods:
 - 1. Hollow Masonry: Sleeve-type anchors.
 - 2. Solid Masonry: Sleeve-type anchors or epoxy anchor bolts.
 - 3. Metal Surfaces: Machine screws, bolts or welded studs.
 - 4. Concrete Surfaces: Wedge or expansion 316 stainless steel anchors.
 - 5. Structural Steel: Right angle, parallel and edge type rigid metal clamps. Do not weld or drill structural steel.

- D. Equipment Mounting:
 - 1. The Electrical Contractor shall be responsible for furnishing and setting all anchor bolts required to install his equipment.
 - 2. Electrical equipment shall be unistrut “stand off” mounted a minimum of ½ - inch from the wall in a manner so that the rear of the equipment is freely exposed to air circulation. Unistrut material shall be 316 stainless steel in NEMA 4X areas and galvanized in non-NEMA 4X areas unless called out specifically in details.
 - 3. All equipment enclosures shall be of the NEMA classification noted on the electrical plan Drawings for the area in which the device will be mounted.
 - 4. Reinforced concrete pad with 316 stainless steel anchor bolts shall be provided for each electrical freestanding equipment.

- E. Dissimilar metals such as aluminum, stainless steel, steel, galvanized steel between enclosures, devices, etc. and mounting surfaces shall be isolated from each other using insulated tape or nonmetal spacers. Tape and spacers used shall be specifically manufactured for this application.

3.07 INSTALLATION, GENERAL

- A. System
 - 1. Install all products per manufacturer’s recommendations and the Drawings.
 - 2. Contract Drawings are intended to show the basic functional requirements of the electrical system and instrumentation system and do not relieve the Contractor from the responsibility to provide a complete and functioning system.
 - 3. Keep a copy of the manufacturer’s installation instructions on the jobsite available for review at all times prior to and during the installation of the associated equipment.

- B. Provide all necessary hardware, conduit, terminal blocks, wiring, fittings, and devices to connect the electrical equipment provided under other Sections. The following shall be done by the Contractor at no additional cost to the Owner:

1. Provide additional devices, wiring, terminal block, conduits, relays, signal converters, isolators, boosters, and other miscellaneous devices as required to complete interfaces of the electrical and instrumentation system.
 2. Changing normally open contacts to normally closed contacts or vice versa.
 3. Adding additional relays to provide more contacts as necessary.
 4. Provide larger circuit breakers, conduit and wire as required for the horsepower of the supplied equipment when the supplied equipment is larger than that specified, at no additional cost to the Owner. Provide lug adapters as necessary when connecting to the wires listed in the Conduit and Wire routing schedule.
 5. Installing additional terminal blocks to land wires.
- C. All programmable devices, shall be programmed, set-up and tested by the Contractor prior to start of witness testing. This includes UPS, and instrumentation. Programming and set-up parameters shall be adjusted or changed as directed by the Owner or Engineer during start-up and throughout the warranty period, at no additional cost to the Owner. Coordinate with the Owner and setup all alarm, process, time delays and operation setpoints.
- D. Coordinate with the Owner and setup all alarm, process, and operation setpoints.
- E. Panels and Enclosures
1. Install panels and enclosures at the location shown on the Plans or approved by the Engineer.
 2. Install level and plumb.
 3. Clearance about electrical equipment shall meet the minimum requirements of NEC 110.66.
 4. Box supports shall be located and oriented as directed in field by Owner.
 5. Seal all enclosure openings, including bottom edge of all pad mounted enclosures to prevent entrance of insects, rodents, dirt, debris, etc.
 6. All conduits entering outdoor panels and enclosures shall use watertight hubs. These hubs shall be located on sides or bottom only. Top entry of outdoor panels or enclosures is not allowed unless specifically shown on plans.
 7. Additional condulets with terminal blocks shall be supplied for wire termination to devices with leads instead of terminals. (i.e. solenoid valves, level probe, etc.)
 8. Terminate all status, control and analog I/O wiring on terminal blocks, including spares. Provide additional relay, DIN rails, terminal blocks and side panels as required.

9. All panels and enclosures be delivered with as-built drawings in clear plastic packets within each panel and enclosure.
10. Provide larger motor termination boxes and lugs as required to accommodate conduit and wires.

F. Conduits and Ducts

1. Care shall be exercised to avoid interference with the work of other trades. This work shall be planned and coordinated with the other trades to prevent such interference. Pipes shall have precedence over conduits for space requirements. Exposed conduits shall be neatly arranged with runs perpendicular or level and parallel to walls. Bends shall be concentric.
2. Exposed conduits runs shall not be run directly on the ground. Secure conduits to 316 stainless steel unistrut.
3. Install conduit free from dents and bruises.
4. All conduits shall be labeled with conduit tags on all ends; at junction boxes, pull boxes, enclosures, stub-outs, or other terminations. All spare conduits shall be labeled.
5. A maximum of three equivalent 90 degree elbows are allowed in any continuous runs. Install pull boxes where required to limit bends in conduit runs to not more than 270 degrees or where pulling tension would exceed the maximum allowable for the cable.
6. Route all above grade outdoor conduits or conduits in rated areas parallel or perpendicular to structure lines and/or piping.
7. Conduits installed outdoor or in NEMA 4X rated areas above grade shall be braced in place with 316 stainless steel Unistrut stanchions or PVC coated clamps with backplates.
8. Conduit entrances: Seal each conduit entrance from below grade into the panels, and other electrical enclosures with plugging compound sealant to prevent the entrance of insects and rodents.
9. Special "Soft-Jaw" type pipe clamps shall be used to prevent damage to PVC-coated conduits while field threading, cutting to length, and coupling sections.
10. Conduits shall be painted to match the color of surface attached to as directed by Owner.
11. Prior to encasement, concealment, backfilling of conduits, temporary conduit labels shall be provided at each end of conduit. Temporary conduit labels shall have ½-inch (minimum) lettering at all transition points. After encasement and concealment, temporary conduit labels shall be placed at each exposed end.

12. Spare or Future Conduits:
 - a. All spares conduits shall be labeled; the conduits shall be mandrelled and have pull ropes (pull tapes) installed.
 - b. Pull rope shall be ½” wide, polyester, rated 1250 pounds tensile strength. Provide a waterproof label on each end of the pull rope to indicate the destination of the other end. Pull tape shall be printed with sequential footage. Pull tape shall be Neptco Muletape WP1250P or approved equal.
 - c. Provide caps on conduit ends to prevent entrance of dirt or insects.
13. Conduits shall be painted to match the color of surface attached to as directed by Owner.
14. All existing conduits that are reused shall have a mandrel or conduit piston pulled through the entire conduit run to prove the length contains no blockages or obstructions. Mandrelling shall be witness by the Owner.
15. Install new conduit tags for reused conduits at all transition boxes and endpoints. Conduit & Wire Routing Schedule shall be updated as these modifications take place.

G. Conduit and Wire Routing Schedule

1. Conduit material, wire size, and quantity listed in schedule take precedence over Division 26 Specifications.
2. All of the entries for each line in the conduit schedule apply to each conduit when multiple quantity of conduits multiple quantity of conduits (quantity of which are indicated by number entered in conduit no. column in schedule) are listed in the schedule.
3. Wire sizes listed are in AWG or Kcmil and are copper conductors.
4. Extra wire was intentionally placed in the “Conduit & Wire Routing Schedule” which shall be labeled on both ends with a unique wire label.
5. Contractor to supply and install all conduits and wiring as shown on Utility Engineered Design drawings. Utility primary and secondary conduit and wiring shown in “Conduit and Wire Routing Schedule” is for bid purposes only. A credit or add-on will be provided by Contractor based on the actual work performed by Contractor for the Utility service.
6. All control and signal wiring terminations shall have the correct wire label applied prior to making connection.
7. Conduit entries listed as “GRS-PVC” in the Conduit & Wire Routing Schedule are to be “Galvanized Rigid Conduits with PVC coating” the entire length.
8. Vertical offsets and sloping of conduits are not detailed on plans, the Electrical Contractor shall include in his bid the price for the complete

conduit run utilizing the civil & mechanical plans to measure vertical & slope distances.

9. Exposed conduits runs shall not be run directly on the ground or roof. Secure conduits to stainless steel unistrut.
10. Duct-taping conduits together is not acceptable. Conduits, installed into concrete pads, shall be installed with a minimum of 2” distance between conduits to allow installation of bushings.
11. Seals
 - a. Seal around all conduits, wires, and cables penetrating between panels, walls, ceilings, and floors in all buildings with a fire stop material. Seal shall be made at both ends of the conduit with a fire stop putty. Seal shall have a minimum two hour rating. Fire stop sealing shall be International Protective Coatings Flamesafe, or approved equal.
 - b. Seal around conduits entering outside to inside structures and around bottom of free standing enclosures to maintain watertight integrity of structure.
 - c. Place conduit seal inside each underground conduit riser into panels and enclosures to prevent entrance of insects and rodents.
 - d. Seal conduits entering any electrical instrument and install conduit drains as necessary to prevent corrosion from water condensation.
 - e. Silicone seal around the base of all ground mounted panels to prevent water intrusion.
 - f. Conduit entrances: Seal each conduit entrance from below grade into the MCC and other electrical enclosures with plugging compound sealant to prevent the entrance of insects and rodents. Conduits between the enclosures shall be sealed with plugging compound sealant on each end. Plugging compound sealant shall be PRC-DeSoto Aerospace Semco PR-868 or approved equal.

H. Excavation and Back Filling

1. The Electrical Contractor shall provide the excavation for equipment foundations, and trenches for conduits or buried cables.
2. Underground conduits outside of structures shall have a minimum cover of 24 inches except for utility conduits depth shall be as required by the governing utility requirements. Back filling shall be done only after conduits have been inspected.
3. Trenches for all underground utility lines shall be excavated to the required depths.
4. Repave any area that was paved prior to excavation. Backfill and surface all areas as shown on the Drawings or where not shown to the original condition that was present prior to the excavation.

5. Contractor shall uncover any uninspected covered conduit trenches, at no additional cost to Owner, to verify proper installation.
6. Excavation and back fill conduit trenches shall conform to the requirements of the Earthwork Section of these Specifications, unless modified on plans, and to other entities as required. Backfill shall consist of 3/4 inch class 2 aggregate base material, unless otherwise noted.
7. At all times during the installation of the electrical distribution system, the Contractor shall provide barricades, fences, guard rails, etc., to safeguard all personnel, including small children, from excavated trenches.

I. Wiring, Grounding and Shielding

1. It is important to observe good grounding and shielding practices in the generally noisy environment in this application. The shield of shielded cables shall be terminated to ground at one end only (source end), the shield at the other end (receive end) shall be encased in an insulated material to isolate it from ground.
2. Special cables shall be provided when required by manufacturer or necessary to correct noise or distortion interference at no additional cost to Owner.
3. Field wiring shall not begin until interconnection drawings have been submitted by the Contractor and approved by the Engineer.

J. Cutting and Patching: The Contractor shall do all cutting and patching required to install his work. Any cutting which may impair the structure shall require prior approval by the Engineer. Cutting and patching shall be done only by skilled labor of the respective trades. All surfaces shall be restored to their original condition after cutting and patching. Paint patched surfaces to match the original color.

K. Housekeeping Pads:

1. Concrete housekeeping pads are required for all free standing electrical equipment. Housekeeping pads shall be 3-1/2" inches above surrounding finished floor or grade unless otherwise shown and shall be 4 inches (minimum) larger in width on all sides of equipment. The depth of housekeeping pads shall be 18 inches (minimum).
2. Housekeeping pads shall be installed for future units as shown on the Contract Drawings.
3. Housekeeping pad shall be Class "A" concrete with rebar crossway network. The minimum size rebar allowed is #3. Concrete shall be precisely leveled so that equipment set in place will not require shimming.

L. Cleaning and Touch Up

1. Prior to startup and at completion of the work prior to final acceptance, all parts of the installation, including all equipment, exposed conduit, devices, and fittings shall be cleaned and given touch up by Contractor as follows:
 - a. Remove all grease and metal cuttings.
 - b. Any discoloration or other damage to parts of the building, the finish, or the furnishings, shall be repaired.
 - c. Thoroughly clean any of his exposed work requiring same.
 - d. Vacuum and clean the inside of all MCC and electrical and instrumentation enclosures.
 - e. Clean all above and below ground pull boxes, junction boxes, and vaults from all foreign debris prior to final acceptance.
 - f. Paint all scratched or blemished surfaces with the necessary coats of quick drying paint to match adjacent color, texture, and thickness. This shall include all prime painted electrical equipment, including enclosures, panels, poles, boxes, devices, etc.
 - g. Remove all decals and lettering from both sides of support plates.
 - h. Repair damage to factory finishes with repair products recommended by Manufacturer.
 - i. Repair damage to PVC or paint finishes with matching touchup coating recommended by Manufacturer.

3.08 ELECTRICAL TESTING

A. General Requirements

1. It is the intent of these tests to assure that all equipment is operational within industry and manufacturer's tolerances and is installed in accordance with design plans and specifications.
2. All equipment setup and assembled by the Contractor shall be in accordance with the design plans and Drawings and the manufacturer's recommendations and instructions and shall operate to the Engineer's satisfaction.
 - a. Follow all manufacturer's instructions for handling, receiving, installation, and pre-check requirements prior to energization.
 - b. After energization, follow manufacturer's instructions for programming, set-up and calibration of equipment.
 - c. The Contractor shall be responsible for, and shall correct by repair or replacement, at his own expense, equipment which, in the opinion of the Engineer, has been caused by faulty mechanical or electrical assembly by the Contractor.
 - d. Necessary tests to demonstrate that the electrical and mechanical operation of the equipment is satisfactory and meets the

- requirements of these Specifications shall be made by the Contractor at no additional cost to the Owner.
3. The testing shall not be started until the manufacturer has completed fabrication, wiring, setup, and programming; performed satisfactory checks and adjustments; factory testing sheets approved by Owner; and can demonstrate the system is complete and operational.
 4. Factory Test Scheduling:
 - a. The testing shall not be started until:
 - 1) The Manufacturer has completed fabrication, wiring, and setup; performed satisfactory checks and adjustments; and can demonstrate the system is complete and operational.
 - 2) Submittals associated with the equipment have been approved by the Engineer
 - 3) PLC Design review meetings have taken place to the satisfaction of the Owner.
 - 4) Certification of completion of Contractor's in-house tests shall be submitted prior to scheduling of factory testing.
 - b. If factory test equipment is significantly different from submittal drawings, this shall be grounds for cancellation and rescheduling of factory tests at no additional costs to Owner or extension of Contract time.
 5. The first Pre-Energization tests shall be performed to determine the suitability for energization and shall be completed with all power turned off and complete prior to the start of any of the Post-Energization Tests. The Electrical Contractor shall have qualified personnel on the job site for all Pre-Energization and Post-Energization tests.
 6. Testing Sheets and Procedures:
 - a. The supplier shall submit for approval, the proposed factory & field testing sheets at least two weeks prior to the start of the tests. Each testing sheet shall have a title giving the type of test and entry spaces for the name of the person who performed the test, name of the person who witnessed the test, and the date.
 - b. Separate test procedures in separate binders shall be submitted for approval for the Factory and Field Tests. Testing shall not commence until the test procedures have been reviewed and approved by the Owner. Tests forms shall be similar to those shown on Appendix "A".
 7. All tests shall be witnessed by the Engineer and/or Owner personnel. The test forms shall be completed by the testing person for field checkout, testing, and calibration of all equipment and instruments.

- a. All filled in test forms shall be given to the Engineer and/or Owner the day of the test. Fill in two sets of test forms if Contractor wants to keep a copy.
- b. All tests shall be documented in writing by the supplier and signed by the Engineer as satisfactory completed. The supplier shall keep a detailed log of all tests that failed or did not meet specifications, including date of occurrence and correction.
- c. Completed forms with proper signatures and dates shall be included and become a component of the Operations and Maintenance Manual for each of the respective systems.
- d. The Contractor shall notify the Owner and the Engineer of the Supplier's readiness to begin all factory and field tests in writing (a minimum of ten working days prior to start), and shall schedule system checkout on dates agreed to by the Owner and the Engineer in order that the testing be scheduled and witnessed.
- e. The Contractor shall fill in & submit for approval the "Scheduled Test Request Form" located in Appendix "A" for each requested inspection, factory and field test.

B. FAILURE-TO-MEET TEST:

1. Any system material or workmanship which is found defective on the basis of acceptance tests shall be reported to the Engineer. The Contractor shall replace the defective material or equipment and have tests repeated until test proves satisfactory to the Engineer without additional cost to the Owner.
2. If the results of any of tests are unacceptable to the Engineer, the Contractor shall make corrections and perform the tests again until they are acceptable to the Engineer; these additional tests shall be done at no additional cost to the Owner.
3. If testing, installation or configuration work performed is deemed inadequate by Owner or Engineer, then the Contractor shall provide a qualified technician to meet these requirements. No extension of Contract time will be allowed.
4. If Owner Representative determines that the System Set-up is not ready for testing, the Owner Representative reserves the right to cancel the Factory Test as the equipment is found to be not fully and completely ready for factory testing. The Contractor shall be responsible for paying for the Owner and Engineer to return for the factory testing when it has been cancelled.

C. SAFETY

1. Testing shall conform to the respective manufacturer's recommendations. All manufacturer's safety precautions shall be followed.

2. The procedures stated herein are guidelines for the intended tests, the Contractor shall be responsible to modify these tests to fit the particular application and ensure personnel safety. Absolutely no tests shall be performed that endanger personal safety.
3. The Contractor shall have two or more personnel present at all tests.
4. Two non-licensed portable radios are to be made available by the Contractor for the testing organization to conduct tests.
5. California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): The Contractor is cautioned that testing and equipment shall comply with ESO and OSHA as to safety, clearances, padlocks and barriers around electrical equipment energized during testing.
6. Vacuum and clean the inside of all MCC and electrical and instrumentation enclosures prior to any factory and field testing.
7. Field inspections and pre-energization tests shall be completed prior to applying power to equipment.

D. ELECTRICAL FACTORY TEST

1. The System supplier shall conduct a thorough and complete factory test by qualified factory-trained personnel witnessed by Owner per the criteria specified herein. Factory test shall be held within 150 miles of project location.
2. The “System set-up” for factory testing shall consist of, but is not limited to:
 - a. Electrical Cabinet
 - b. Control Panel
 - c. Manual Transfer Switch
 - d. Any miscellaneous associated electrical equipment or panels
3. Temporary wiring and equipment shall be setup during these tests to simulate the complete assembled system.
4. The length of the factory testing for the “System setup” shall be a minimum of one (1) working day. If, in the opinion of the Owner or Engineer, the factory testing is not completed at the end of the working day, the testing shall be extended, at no additional cost to the Owner or extension in Contract time. The Contractor shall agree that the sum set forth hereafter is a reasonable amount to be charged as liquidated damages; and it is therefore agreed that the Contractor will pay the Owner the sum of one thousand five hundred dollars (\$1,500.00) in liquidated damages for each and every calendar day beyond the time prescribed above for the completion of factory testing for the System set-up. Liquidated damages will be assessed to the Contractor each and every day past the time allotted for factory testing.

5. All factory tests shall be conducted at the Supplier's facility. All factory tests shall be completed prior to shipment of any of the "System set-up" to the jobsite. The "System set-up" shall be fully assembled, programmed, and connected as it will be installed in the final configuration. If the "System set-up" is found to be not fully and completely ready for factory testing, the Contractor shall be responsible for paying for the Owner and Engineer to return for the factory testing. Factory testing is to ensure that there are no defects. The hardware and software shall be tested for compliance with the plans and Specifications included herein and for the ability to perform the control functions.
6. All components of the system setup shall be completely assembled and thoroughly pre-tested by the supplier or manufacturer before start of factory test.
7. Provide a complete clean copy of System Supplier drawings for Owner and Engineer's use during Factory Test prior to starting the tests. These drawings shall reflect the equipment being tested.
 - a. If Owner Representative determines that these drawings do not adequately reflect the actual equipment being tested or differs substantially from the approved equipment submittal, the Owner Representative reserves the right to cancel the Factory Test as the equipment is found to be not fully and completely ready for factory testing.
 - b. Equipment that differs substantially from the approved equipment submittal shall be resubmitted. Factory test will be rescheduled after revised submittals have been reviewed by the Engineer and marked "No Exceptions Taken" or "Make Corrections Noted".
 - c. No extension of Contract time will be allowed. Cancellation and rescheduling of factory tests shall occur at no additional costs to Owner
 - d. The Contractor shall be responsible for paying for the Owner and Engineer to return for the factory testing when it has been cancelled.
8. The associated factory tests for each of the factory testing sheets that are to be performed by the supplier and witnessed by the Owner/Engineer shall include the following for the "System set-up" as a minimum:
 - a. Inspections of the panels as follows:
 - 1) Visual and Mechanical:
 - a) Inspect for physical damage, proper support, and wiring.
 - b) Check all starters, breakers, and other components for proper sizes.

- 2) The Contractor shall fill in test form TF4, located in Appendix “A”.
- b. Testing of the Equipment as follows:
- 1) Each line of control logic on the elementary or loop diagrams shall be checked. After a line of control logic is tested, the person performing test shall initial or highlight the corresponding line on the elementary diagram. When the complete elementary diagram has been checked, it shall be signed and dated by testing person and person witnessing test.
 - 2) I/O points to terminal blocks shall be simulated for the complete checkout of PLC interfaces.
 - 3) The tests, as a minimum, shall simulate all operating conditions including steady state, transients, upsets, startup, shutdown, power failure, and equipment failure conditions (for control logic).
 - 4) The Contractor shall complete each test and fill in the I/O test form TF13 located in Appendix “A”.
- c. Testing of Control as follows:
- 1) To facilitate testing and system simulation of the “System Set-up”, the Supplier shall connect a separate toggle two position on-off switch to each status and alarm digital input. Three digital multi-meters (minimum +/- 0.2% accuracy) with clip-on leads shall be supplied and utilized during testing for measurement of digital and analog outputs. The supplier shall use simulated input signals to replicate varying field device signals during the factory tests in order to verify the proper functioning of hardware and software.
- d. The structured factory tests to be performed by the System Supplier and witnessed by the Owner shall include the following as a minimum:
- 1) Control Checkout Tests: Simulate the digital or analog signals (or combination thereof) at the panel field terminals using the test hardware to verify that each control is functional and properly configured. Verify that all parameters (i.e., relay logic operations, relay timing, controller setpoints, etc.) of the control system are defined and operate according to the design documents.
 - 2) Alarm Checkout Tests: Simulate the digital or analog signals (or combination thereof) at the panels using the test hardware to verify that each I/O point is functional and properly configured. Verify that all parameters (i.e., description, engineering units, span, enable/disable, setpoints, runtimes, totalization, logic type, etc.) of the

alarms are defined and operate according to the Specifications.

- e. Unstructured factory tests are required as part of the factory testing phase. These additional tests shall include any and all unstructured tests as directed by the Owner or Engineer. The various unstructured tests shall include, but are not limited to, the following:
 - 1) Verify the correct inventory of hardware, etc. All spare parts shall be included in the inventory.
 - 2) The factory tests, as a minimum, shall simulate all normal and abnormal operating conditions including steady state, change of state, variable changes, fluctuations, transients, upsets, start-up, shutdown, power failure, and equipment failure conditions.
9. The factory test will be considered complete only when the integrated system has successfully passed all tests to the satisfaction of the Owner or Engineer and the Factory Test checkout form TF11 has been signed & dated by Owner. No electrical equipment shall be shipped to jobsite without authorization from the Owner or Engineer that the factory test has been completed. Equipment that were shipped to the jobsite without authorization shall be shipped back to the System Supplier for witness testing at no additional cost to Owner.
10. Acceptance and witnessing of the factory tests does not relieve or exclude the Contractor from conforming to the requirements of the Contract Documents.
11. The testing personnel shall provide all material, equipment, labor and technical supervision to perform such tests and inspections.
12. During the testing period, under the supervision of the supplier, the Engineer and other Owner personnel shall have unlimited and unrestricted access to the usage and testing of all hardware and software in the system.
13. Spare parts, including spare I/O for the system shall also be tested during this test period. The supplier shall prove by temporarily connecting the spare hardware to the system that any or all of the spare parts function in a manner equivalent to the original equipment under test.
14. The Contractor shall pay all expenses incurred by his personnel which includes labor, material, transportation, lodging, daily subsistence, and other associated incidental costs during the factory testing.
15. Faulty and/or incorrect hardware operation of major portions of the system may, at the discretion of the Owner Engineer, be cause for suspension or restarting of the entire factory test, at no additional cost to the Owner or extension in contract time.
16. The factory test will be considered complete only when the system setup has successfully passed all tests both structured and unstructured to the

satisfaction of the Owner Engineer. No equipment shall be installed without authorization from the Owner Engineer that the factory test has been completed.

17. All modifications to drawings and documentation as a result of the factory tests shall be corrected and completed before shipment of drawings with equipment and the submittal and delivery of “operation and maintenance” manuals.
18. Copies of the completed, signed, and witnessed factory testing forms shall be placed in the Operation and Maintenance Manual.

E. Electrical Field Tests

1. The Contractor shall engage and pay for the services of an approved qualified testing company for the purpose of performing inspections and tests as herein specified. The testing company shall provide all material, equipment, labor and technical supervision to perform such tests and inspections. The Electrical Contractor shall be present on site for all field tests.
2. Prior to start of any field testing, the Field Test Procedures, Interconnection Drawings and Preliminary Operation and Maintenance Manuals shall have been submitted by the Contractor and approved by the Engineer. Also, prior to start of field testing of equipment, correct machine printed wire labels shall be in place on all wires associated with that equipment.
3. The Electrical Contractor shall complete and submit “Schedule Test Request Form” as illustrated in Appendix “A” for each electrical field test.
4. The Electrical Contractor shall be at the jobsite to assist with all Electrical Field Tests.
5. Pre-Energization Tests: These tests shall be completed prior to applying power to any equipment.
 - a. Inspections:
 - 1) Visual and mechanical inspections:
 - a) Inspect for physical damage, proper anchorage and grounding.
 - b) Compare equipment nameplate data with design plans and starter schedule.
 - c) Compare overload setting with motor full load current for proper size.
 - 2) Performed NETA acceptance testing for each piece of equipment.
 - 3) The Testing Company shall compile, by visual inspection a record of all motor nameplate data, the following minimum

data shall be neatly tabulated in spreadsheet form and submitted to Owner:

- a) Manufacturer
 - b) Part and model number
 - c) Equipment driven
 - d) Motor horsepower
 - e) Nameplate amperes, volts and phase
 - f) Service factor
 - g) Temperature ratings
 - h) Overload catalog number
 - i) Overload current range and setting
 - j) Circuit breaker rating
 - k) Circuit breaker trip setting, for magnetic only circuit breakers.
- 4) The Contractor shall fill in, for each piece of equipment, Test Form TF4 located in Appendix "A".
- b. Torque Connections:
- 1) All electrical, mechanical and structural threaded connections inside equipment shall be tightened in the field after all wiring connections have been completed. Every worker tightening screwed or bolted connections shall be required to have and utilize a torque screwdriver/wrench at all times. Torque connections to the value recommended by the equipment manufacturer. If they are not available, use NEC Annex I for torque values as guidelines.
- c. Wire Insulation & Continuity Tests:
- 1) All devices that are not rated to withstand the 500V megger potential shall be disconnected prior to the megger tests.
 - 2) Megger insulation resistances of all 600 volt insulated conductors using a 500 volt megger for 10 seconds. Make tests with circuits installed in conduit and isolated from source and load. Each field conductor shall be meggered conductor to conductor and conductor to ground. These tests shall be made on cable after installation with all splices made up and terminators installed but not connected to the equipment.
 - 3) Each megger reading shall not be less than 10 Meg-ohms resistive. Corrective action shall be taken if values are recorded less than 10 Meg-ohms. Values of different phases of conductors in the same conduit run showing substantially different Meg-ohm values, even if showing above 10 Meg-ohms shall be replaced.

- 4) Each instrumentation conductor twisted shielded pair shall have the conductor and shield continuity measured with an ohmmeter. Conductors with high ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.
 - 5) The Contractor shall fill in test forms Power and Control Conductor Test Form TF1 and Instrumentation Conductor Test Form TF2 located in Appendix "A".
- d. Grounding System Tests:
- 1) Visual and Mechanical Inspection:
 - a) Verify ground system is in compliance with Drawings and Specifications.
 - 2) Electrical Tests:
 - a) Before backfilling trenches, and placement of sidewalks, landscape and paving, measure the resistance of each electrode to ground using a ground resistance tester. Perform the test not less than two days after the most recent rainfall and in the afternoon after any ground condensation (dew) has evaporated.
 - b) After all individual ground electrode readings have been made, interconnect as required and measure the system's ground resistance.
 - c) The grounding test shall be in conformance with IEEE Standard 81.
 - d) The current reference rod shall be driven at least 100 feet from the system under test.
 - e) Measurements shall be made at 10 feet intervals beginning 25 feet from the test electrode and ending 75 feet from it in a direct line between the system being tested and the test electrode.
 - f) Point-to-Point: Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.
 - 3) Test Values:
 - a) The resistance between the main grounding electrode and equipment ground shall be no greater than five ohms per IEEE Standard 142.
 - b) Investigate point-to-point resistance values that exceed 0.5 ohms.
 - c) The Contractor shall fill in Grounding System Test Form TF3 located in Section 26 00 00 Appendix "A".

- d) Plots of ground resistance shall be made and submitted to the Engineer for approval.
- e. Panelboard Tests
 - 1) Visual and Mechanical Inspection:
 - a) Inspect for physical damage, proper anchorage and grounding.
 - b) Compare equipment nameplate data with design plans and panelboard schedules.
 - c) Compare breaker legend for accuracy.
 - d) Check torque of bolted connections.
 - 2) The Contractor shall fill in Panelboard Test Form TF5 located in Appendix "A".
6. Post Energization Tests
 - a. Panels and Enclosure Tests:
 - 1) During these tests, test all local and remote control operations and interlocks.
 - 2) Electrical Tests:
 - a) Perform operational tests by initiating control devices to affect proper operation.
 - b. Instrumentation Tests
 - 1) The Contractor shall provide a minimum of two (2) hours of field acceptance testing for each instrument. If any instrument has not been fully tested during its allotted time, the Contractor shall provide additional hours for finishing testing of the instrument, to be paid by the Contractor.
 - 2) The overall accuracy of each instrument loop shall be checked to ensure that it is within acceptable tolerance.
 - a) As a minimum, all the tests indicated/specified on the test form TF14 in Appendix "A" shall be performed by the Contractor for each of the instruments listed in Appendix "B" Device Index.
 - 3) Test equipment used for testing shall be of suitable quality so as not to mask performance deficiencies. All test equipment shall be traceable to National Bureau of Standards and have been calibrated within six months of test date.
 - 4) Testing shall be accomplished using simulated inputs only with prior written approval of the Owner.
 - 5) Calibration stickers shall be supplied for all equipment and instruments. Calibration stickers shall list the following information:
 - a) Tag number.

- b) Calibrated by who (name), firm, city and telephone number.
 - c) Date calibrated.
 - d) Calibration range.
 - e) Comments.
- c. Control System Tests: The following tests shall be performed for all MCCs and for the control panels listed in Section 26 00 00 Appendix "B", including all non-Division 26 Control Panels.
- 1) Component Tests:
 - a) Measure insulation resistance of starter phase to phase and phase to ground with the starter contacts closed and the protective device open. Test voltage and minimum acceptable values shall conform to NETA Section 3 "Test Values." Measure insulation resistance of each control circuit with respect to ground.
 - b) Motor overload units shall be tested by injecting primary current through overload unit and monitoring trip time.
 - c) Test the motor circuit protectors and thermal breakers as specified herein.
 - 2) Control Tests:
 - a) Remove motor overload heaters from each motor starter or disconnect pump/motor coupling. In case the motor overload heaters are fed by current transformers, the motor conductors shall be removed and insulated away from the load lugs of the motor starter.
 - b) Verify the pump control circuits are wired and operate as shown on the elementary diagrams. Check the indicator lights, alarm lights, local & remote selector switches, alarm contacts, power fail relays, overloads, etc., for proper operation.
 - c) Reinstall all heaters and all wiring removed for this test.
- d. PLC Control System Tests:
- 1) All the I/O points for the PLC shall be tested by the system supplier in the field for proper operation of alarms, status, analog, control, display functions. Where practical, the final element shall be used, i.e. trip the intrusion switch or change levels. Testing shall be accomplished using simulated inputs only when necessary.
 - 2) During this task the System supplier shall have:

- a) Qualified field technician with experience in the startup of similar systems with PLC controls, and other field devices.
- b) Test instruments as required.
- c) A pair of radios for communication.
- 3) Contractor to fill in "I/O Point Checkout Sheet" TF13 located in Appendix "A".
- e. Trial Operations: The entire electrical installation shall be either tested or trial operated to verify Contract compliance. That is, controls, heaters, fans, light switches, convenience receptacles, lights, etc. shall be trial operated. Contractor shall conduct trial operations in the presence of the Engineer and Operations and Maintenance personnel.

F. Operational Testing:

1. After all the previous tests in this subsection 3.07 and 3.08 are complete, the Contractor shall conduct operational testing.
2. The Contractor shall demonstrate the operation of each part of the control and instrumentation system to the satisfaction of the Owner and/or Engineer. Tests shall be repeated by the Contractor at no additional cost to the Owner and at the discretion of the Owner and/or Engineer to resolve whether the system has demonstrated that it will operate under all modes of operations and varying conditions.
3. For the operational testing the new equipment shall be activated to automatically run for 5 days, 24 hours per day, Monday through Friday. During this five day period, the Owner will run the different combinations of the monitoring options. If equipment failure occurs during the 5 days of operational testing, the Contractor shall repair or replace the defective equipment and shall begin another 5 day operational test, Monday through Friday. This shall be continued until the new equipment functions acceptably for 5 consecutive days.
4. The Electrical Contractor, testing firm and System Supplier shall re-visit the jobsite as often as necessary until all field tests, start-up and operation tests are completed and approved.

3.09 OPERATION AND MAINTENANCE MANUALS

- A. Operation and maintenance manuals covering instruction and maintenance on each type of equipment shall be furnished prior to completion of the project.
- B. These instructions shall provide the following as a minimum:

1. Each set bound in a three ring binder and organized as specified herein. Binder shall be sized such that when all material is inserted the binder is not over 3/4 full
 2. “As Constructed” set of submittal shop documents, data sheets, and drawings (with all field changes included) for all items in the electrical system.
 3. A complete list of items supplied, including serial numbers, ranges, options, and other pertinent data necessary for ordering replacement parts.
 4. Full technical specifications on each item.
 5. Instrument data sheets for all instruments supplied on the project, clearly identifying the instrument tagname, range, part number, serial number, size, etc.
 6. Detailed service, maintenance and operation instructions for each item supplied. Schematic diagrams of all electronic devices shall be included. A complete parts lists with stock numbers shall be provided on the components that make up the assembly.
 7. Special maintenance requirements particular to this system shall be clearly defined, along with special calibration and test procedures.
 8. Safety precautions and procedures.
 9. Record of the following:
 - a. Each motor nameplate data including manufacturer, full part number, size, voltage, amps, service factor, bearings, etc.
 - b. Each breaker and overload heater element including manufacturer, full part number, size, setting etc.
 - c. Spread sheet listing all setpoints and programmable parameters entered for this project for UPS, etc.
 10. No photo copies are allowed of standard published manuals available from manufacturers such as for the PLC. All of the manuals shall be originals, not copies.
 11. Include all completed and signed test data and forms from factory and field testing.
 12. Warranty certificate with start dates, duration and contact information.
 13. Troubleshooting instructions.
 14. Record of all settings or parameters for all programmable devices.
- C. At the end of the project these manuals shall be updated to show “as-built or as-installed” conditions.

- D. Provide to the Owner four (4) sets of USB drives on lanyards and two sets of DVDs (DVDs shall contain all documents in both PDF format and unlocked AutoCAD - DWG format):
1. As-built Contract electrical and instrumentation drawings prepared for this project.
 2. As-built set of all required Drawings for the project.
 3. Electronic PDF version of O&M manual. Version format shall follow the hard copy submittal of the O&M, including index, equipment record sheet, warranty information, theory of operation, maintenance instruction, etc. PDF shall “bookmarked” at each index, subtab, transmittal letter, equipment record sheet, warranty information, theory of operation, maintenance instruction, etc. Failure to bookmark PDF may be grounds for immediate rejection without review. Bookmarks shall be descriptive of actual document, tab, etc. Bookmarks shall not be out of order; the English description shall match that listed in the Submittal’s Table of Contents.
 4. These files shall be the property of the Owner, for its use on this and future projects.
 5. Label drives with site name using white plastic with black machine printed lettering as produced by a KROY or similar machine. The size of the nameplate tape shall be with 3/8-inch lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on the USB drive using the adhesion of the tape.

3.10 TRAINING

- A. All training sessions shall be held on dates and times agreeable to Owner. A total of 5 or fewer Owner personnel shall be trained.
- B. After “Operation Testing” has started the Contractor shall provide a period of not less than 8 hours training for instruction of operation and maintenance personnel in the use of all the new electrical and instrumentation systems. The Contractor shall make necessary arrangements with manufacturer’s representative. Provide product literature and application guides for user’s reference during instruction.
- C. Training to include instruction on the use, operation, calibration, programming, and maintenance of the field devices listed in Appendix “B”.
- D. Acceptable Operation and Maintenance Manuals shall be on site and available when training sessions are implemented.

3.11 SPARE PARTS

- A. The Contractor shall supply all spare parts prior to start of field tests. All parts shall be sealed in plastic bags and delivered to each site in a heavy duty plastic storage

bag. Bag shall be clearly labeled on the outside with part name and number and the corresponding equipment tagname.

- B. The Contractor shall make available any replacement parts that are not manufacturer's normal stock items for immediate service and repair of all the instrumentation equipment throughout the warranty period.
- C. The following spare parts shall be provided to the Owner as part of this Contract for each site:
 - 1. Five (5) fuses for each type of fuse.
 - 2. Five (5) lamps for each type of light.
 - 3. Two (2) relays for each type of control, power fail and time delay relay.
- D. See other division 26 sections for additional spare parts to be provided.

3.12 WARRANTY

- A. The Contractor shall warrant all electrical and instrumentation equipment for a period of one (1) year from date of final acceptance. Standard published warranties of equipment which exceed the preceding specified length of time shall be honored by the manufacturer or supplier.
- B. The Contractor shall provide all labor and material to troubleshoot, replace, or repair any hardware or software that fails or operates improperly during the warranty period, at no additional cost to the Owner.
- C. The System Supplier shall have a staff of experienced personnel available to provide service on 2 working days' notice during the warranty period. Such personnel shall be capable of fully testing and diagnosing the hardware and software and implementing corrective measures.
- D. If the System Supplier "fails to respond" in 2 working days, the Owner at its option will proceed to have the warranty work completed by other resources; the total cost (direct and indirect) for these other resources shall be reimbursed in full by the Contractor.
 - 1. "Fail to respond" shall be defined as: The Contractor has not shown a good faith effort and has not expended adequate resources to correct the problem.
 - 2. The use of other resources, as stated above, shall not change or relieve the Contractor from fulfilling the remainder of the warranty requirements.
- E. Prior to "final acceptance", the Contractor shall furnish to the Engineer a listing of warranty information for all manufacturers of materials, instruments, and equipment used on the project. The listing shall include the following:
 - 1. Manufacturer's name, service contact person, phone number, and address.

2. Material and equipment description, equipment number, part number, serial number, and model number.
 3. Manufacturer's warranty expiration date.
- F. Each time the Supplier's repair person responds to a system malfunction during the warranty period, he or she must contact the designated Owner maintenance supervisor for scheduling of the work, access to the jobsite, and permission to make repairs. Operation of facilities necessary to test equipment shall only be performed by or under the direction Owner staff. Owner reserves the right at its sole discretion to deny operations requested by the Supplier. A written description of all warranty work performed shall be documented on a field service report to be given to Owner prior to the repair person leaving job site. This field service report shall detail and clearly state problem, corrective actions taken, additional work that needs to be done, data, repair person name and company.

3.13 FINAL ACCEPTANCE

- A. Final acceptance will be given by the Owner after the equipment has passed the "operational testing" trial period, each deficiency has been corrected, final documentation has been provided, and all the requirements of design documents have been fulfilled.
- B. At the end of the project, following the completion of the field tests, and prior to final acceptance, the Supplier shall:
1. Remove all temporary services, equipment, material and wiring from the site.
 2. Verify Service equipment has been legibly marked in field with the maximum available fault current per NEC 110.24 (A). Field marking shall include date the fault current calculation was performed and be weather & UV rated. Service equipment shall not be hand labeled.
 3. Two sets of all keys for locks supplied on this project. Submit each key with matching duplicate. Wire all keys for each lock securely together. Tag and plainly mark with lock number or equipment identification, and indicate physical location, such as panel or switch number.
 4. Verify that as-installed drawings, in reinforced clear plastic pockets, have been placed in all new or modified panels.
 5. Provide the following to the Owner:
 - a. Listing of warranty information.
 - b. Each "Operation and Maintenance" manual shall be modified or supplemented by the Supplier to reflect all field changes and as-built conditions.
 - c. O&M documentation, as specified herein.

APPENDIX "A"

ELECTRICAL & INSTRUMENTATION FORMS

Index of Forms:

Bill of Material

Schedule Test Request Form

TF1 Power and Control Conductor Test Form

TF2 Instrumentation Conductor Test Form

TF3 Grounding System Test Form

TF4 Visual and Mechanical Inspection Form

TF5 Panelboard Test Form

TF11 Factory Test Checkout Form

TF13 I/O Point Checkout Test Sheet

TF14 Instrument Data Sheet and Calibration Record

SCHEDULED TEST REQUEST FORM

COMPANY PERFORMING TEST: _____
TESTING PERSONNEL : _____
PHONE NUMBER OF COMPANY: _____
TEST PROCEDURE SUBMITTAL: _____ APPROVED : ___/___/___
SCHEDULED TEST DATE : _____ DATE : ___/___/___

TIME	DESCRIPTION OF TEST
8:00	
9:00	
10:00	
11:00	
12:00	
13:00	
14:00	
15:00	
16:00	

NOTES:

TESTED BY : _____ DATE : ___/___/___
WITNESSED BY: _____

VISUAL AND MECHANICAL INSPECTION FORM

TEST FORM (TF4)

EQUIPMENT

NAME : _____ LOCATION : _____

NAMEPLATE DATA

MFGR. :	_____	SERIES # :	_____
MODEL # :	_____	U.L. # :	_____
VOLTAGE :	_____	PHASE :	_____
AMPERAGE :	_____	SERVICE :	_____
BUS TYPE :	_____	BUS BRACING:	_____
VERT. BUS :	_____	HORZ. BUS :	_____
GND. BUS :	_____	NEU. BUS :	_____
ENCLOSURE :	_____		_____
	_____		_____

INSPECTION CHECK LIST

ENTER: A-ACCEPTABLE R-NEEDS REPAIR OR REPLACEMENT NA-NOT APPLICABLE

TIGHTEN ALL BOLTS AND SCREWS	_____
TIGHTEN ALL WIRING AND BUS CONNECTIONS	_____
VERIFY ALL BREAKERS AND FUSES HAVE PROPER RATING	_____
CHECK BUS BRACING AND CLEARANCE	_____
CHECK MAIN GROUNDING CONNECTION AND SIZE	_____
INSPECT GROUND BUS BONDING	_____
CHECK EQUIPMENT GROUNDS	_____
CHECK CONDUIT GROUNDS AND BUSHINGS	_____
INSPECT NEUTRAL BUS AND CONNECTIONS	_____
CHECK HEATERS AND THERMOSTATS	_____
CHECK VENTILATION AND FILTERS	_____
CHECK FOR BROKEN OR DAMAGED DEVICES	_____
CHECK DOOR AND PANEL ALIGNMENT	_____
INSPECT ANCHORAGE	_____
CHECK FOR PROPER CLEARANCES AND WORKING SPACE	_____
REMOVE ALL DIRT AND DUST ACCUMULATION	_____
INSPECT ALL PAINT SURFACES	_____
CHECK FOR PROPER WIRE COLOR CODES	_____
INSPECT ALL WIRING FOR WIRE LABELS	_____
CHECK FOR PROPER WIRE TERMINATIONS	_____
CHECK FOR PROPER WIRE SIZES	_____
INSPECT ALL DEVICES FOR NAMEPLATES	_____
CHECK IF DRAWINGS MATCH EQUIPMENT	_____
CHECK ACCURACY OF OPERATION & MAINTENANCE	_____

TESTED BY : _____

DATE : ___/___/___

WITNESSED BY: _____

PANEL-BOARD TEST FORM

TEST FORM (TF5)

PANEL NAME: _____ LOCATION : _____

NAMEPLATE DATA

MFGR. : _____	SERIES # : _____
MODEL # : _____	U.L. # : _____
VOLTAGE : _____	PHASE : _____
AMPERAGE : _____	SERVICE : _____
BUS TYPE : _____	BUS BRACING: _____
VERT. BUS : _____	HORZ. BUS : _____
GND. BUS : _____	NEU. BUS : _____
ENCLOSURE : _____	MAIN BKR : _____

CALIBRATION EQUIPMENT DESCRIPTION : _____ DATE: _____

INSULATION RESISTANCE TESTS - MEGOHMS					
A-GND	B-GND	C-GND			

INSPECTION CHECK LIST

ENTER: A-ACCEPTABLE R-NEEDS REPAIR OR REPLACEMENT NA-NOT APPLICABLE

- TIGHTEN ALL BOLTS AND SCREWS _____
- TIGHTEN ALL WIRING AND BUS CONNECTIONS _____
- VERIFY ALL BREAKERS AND FUSES HAVE PROPER RATING _____
- CHECK BUS BRACING AND CLEARANCE _____
- CHECK MAIN GROUNDING CONNECTION AND SIZE _____
- INSPECT GROUND BUS BONDING _____
- CHECK EQUIPMENT GROUNDS _____
- CHECK CONDUIT GROUNDS AND BUSHINGS _____
- INSPECT NEUTRAL BUS AND CONNECTIONS _____
- CHECK FOR BROKEN OR DAMAGED DEVICES _____
- CHECK DOOR AND PANEL ALIGNMENT _____
- INSPECT ANCHORAGE _____
- CHECK FOR PROPER CLEARANCES AND WORKING SPACE _____
- REMOVE ALL DIRT AND DUST ACCUMULATION _____
- INSPECT ALL PAINT SURFACES _____
- CHECK FOR PROPER WIRE COLOR CODES _____
- INSPECT ALL WIRING FOR WIRE LABELS _____
- CHECK FOR PROPER WIRE TERMINATIONS _____
- CHECK FOR PROPER WIRE SIZES _____
- INSPECT ALL DEVICES FOR PROPER LEGEND NAMEPLATES _____

CALIBRATION TEST EQUIPMENT PART NO.	DATE CALIBRATED:

TESTED BY : _____ DATE : ___/___/___
 WITNESSED BY: _____

**FACTORY TEST
MCC/CONTROL PANEL CHECKOUT FORM (TF11)**

Manufacturer: _____

Location: _____

Job No.: _____

Tel: _____ **Fax:** _____

MCC / Control Panel: _____

TEST RESULT

OVERALL PANEL INSPECTION

Pass Fail

- | | | |
|--|--------------------------|--------------------------|
| 1. All front panel and back panel components mounted securely..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. All wiring terminated and labeled correctly..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. All components, wiring, and labeling accurately reflected on the drawings.. | <input type="checkbox"/> | <input type="checkbox"/> |

POWER-UP INSPECTION

- | | | |
|--|--------------------------|--------------------------|
| 1. Voltage levels on load side of circuit breakers..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Voltage levels at the DC terminals of the power supply..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Voltage levels at the DC power distribution terminals..... | <input type="checkbox"/> | <input type="checkbox"/> |

POWER DISTRIBUTION AND GENERAL COMPONENT TESTING

- | | | |
|---|--------------------------|--------------------------|
| 1. Power distribution to the appropriate components..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Operation of the ancillary components such as receptacles, work lights, etc. | <input type="checkbox"/> | <input type="checkbox"/> |

CONTROL COMPONENTS CHECKS

- | | | |
|---|--------------------------|--------------------------|
| 1. Operators (push buttons, selector switches, pilot lights)..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Inputs from External Sources..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Outputs to External Sources..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Relay Logic..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. PLC I/O and Program Verification..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. O/I Display Verification..... | <input type="checkbox"/> | <input type="checkbox"/> |

Notes:

1. For relay logic checks, each rung of the elementary or loop diagram is to be highlighted in yellow as they are verified for correct control functions.
2. For PLC I/O and program verification, the control strategies shall be highlighted in yellow as each logic function is tested.

Tested by: _____

Witnessed by: _____

Date: _____

APPENDIX "B"

DEVICE INDEX

16010 INSTRUMENTATION DEVICE INDEX

P&ID DWG	E DWG	TAG	NO.	DESCRIPTION	TYPE	SPECS	MINIMUM NEMA RATING	SIZE	VOLT	SP / RANGE	UNITS	DWG REF DET MOUNTING	NOTES AND ACCESSORIES	16010 TEST FORM
I2	E3	LIT	151	Level Indicating Xmtr	Gauge	16010-2.07.A	4X	-	24Vdc	0-30	FEET	Pipe		TF-14
I2	E2	ZS	191	A-B Position Switch	N.C.	16010-2.07.B.1	4X	-	24Vdc	-	-	Panel Door		TF-7
I2	E4	ZS	192	Position Switch	N.C.	16010-2.07.B.2	4X	-	24Vdc	-	-	E3-A		TF-7

END OF SECTION

SECTION 33 12 16 – VALVES AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes basic requirements for valves.

1.02 REFERENCES

- A. ASTM International (ASTM)
 - 1. ASTM A126 - Specification for Gray Iron Casting for Valves, Flanges, and Pipe Fittings
 - 2. ASTM A167 - Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
 - 3. ASTM A536 - Specification for Ductile Iron Castings
 - 4. ASTM E527 - Practice for Numbering Metals and Alloys (UNS)
- B. American Water Works Association (AWWA)
 - 1. AWWA C111 – Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe Fittings
- C. NSF International (NSF)
 - 1. NSF 61 – Drinking Water System Components – Health Effects
- D. Society for Protective Coatings (SSPC)
 - 1. SSPC SP7 - Brush-Off Blast Cleaning
 - 2. SSPC SP10 - Surface Preparation Specification for Near-White Blast Cleaning

1.03 DESIGN REQUIREMENTS

- A. Pressure Rating
 - 1. Suitable for service under minimum working pressures of 150 pounds per square inch gauge
 - 2. When a piping system is specified in the Piping Schedule to be tested at a pressure greater than 150 pounds per square inch gauge, provide valves for that piping system with design working pressure which is sufficient to withstand the test pressure.
- B. Valve to piping connections.
 - 1. Valves 3-inch nominal size and larger shall have flanged ends.
 - 2. Valves less than 3-inch nominal size shall have screwed ends.

1.04 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.
- B. Submittals prior to installation

1. Submit detailed Product Data relating to the valve including description of component parts, materials of construction, performance, dimensions, and weights.
- C. Furnish bound sets of installation, operation, and maintenance instructions for each type of valve 4-inch in nominal size and larger and all non-manual valves. Include information on valve operators in operation and maintenance instruction manual.

1.05 QUALITY ASSURANCE

- A. Valves shall be manufactured by manufacturers whose valves have had successful operational experience in comparable service.

1.06 DELIVERY STORAGE AND HANDLING

- A. Protect valves and protective coatings from damage during handling and installation; repair coating where damaged.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Stainless steel shall be ASTM A167, Type 316, UNS Alloy S31 600 stainless steel.
- B. Valve and operator bolts and nuts
 1. Fabricated of 316 stainless steel for the following installation conditions:
 - a. Submerged in sewage or water.
 - b. In an enclosed space above sewage or water
 - c. In structures containing sewage or water, below top of walls.
 - d. At openings in concrete or metal decks
 - e. Stem guides
 2. Where dissimilar metals are being bolted, use stainless steel bolts with isolation bushings and washers.
 3. Underground bolts shall be low-alloy steel in accordance with AWWA C 111/A21.11.
- C. Use bronze and brass alloys with not more than 6 percent zinc and not more than 2 percent aluminum in the manufacture of valve parts; UNS Alloy C83600 or C92200 unless specified otherwise.
- D. Valve bodies shall be cast iron in accordance with ASTM A126, Class 30 minimum or ductile iron in accordance with ASTM A536, Grade 65-45-12 minimum unless specified otherwise.

2.02 INTERIOR PROTECTIVE LINING

- A. Provide valves with the type of protective lining specified per this Section unless specified otherwise in the particular valve specification.

B. Apply protective lining to interior, non-working surfaces, except stainless steel surfaces.

C. Lining Types

1. Fusion Bonded Epoxy

- a. Manufacturers shall be the following or equal:
 - 1) 3-M Company, ScotchKote 134; certified to NSF 61 for drinking water use
- b. Clean surfaces to meet SSPC SP-7 or SP-10, as recommended by epoxy manufacturer.
- c. Apply in accordance with manufacturer's published instructions.
- d. Lining thickness shall be 0.010 to 0.012 inches except:
 - 1) Lining thickness in grooves for gaskets shall be 0.005 inches.
 - 2) Seat grooves in valves with bonded seat shall not be lined.
- e. Quality Control
 - 1) Lining thickness shall be measured with a non-destructive magnetic type thickness gauge.
 - 2) Verify lining integrity with a wet sponge-testing unit operating at approximately 60 volts, or as recommended by the lining manufacturer.
 - 3) Consider tests successful when lining thickness meets specified requirements and when no pinholes are found.
 - 4) Correct defective lining disclosed by unsuccessful tests, and repeat test.
 - 5) Repair pinholes with liquid epoxy recommended by manufacturer of the epoxy used for lining.

2. High Solids Epoxy

- a. As specified in Section 09 97 14.
- b. After lining is cured, check lined surface for porosity with a holiday detector set at 1,800 volts, or as recommended by lining manufacturer.
 - 1) Repair holidays and other irregularities and retest lining.
 - 2) Repeat procedure until holidays and other irregularities are corrected.

2.03 ALTITUDE LEVEL CONTROL VALVE – ONE WAY FLOW WITH DELAYED OPENING

- A. The altitude level control valve shall control the high-water level in the reservoir without the need for floats or other devices. It shall be a non-throttling type valve and remain fully open until the shut-off point in the reservoir is reached. The valve shall be designed for one way flow with a delayed opening until the water level in the reservoir reaches a desired level.
- B. The altitude level control valve shall be fluid actuated with solenoid override and have a single moving assembly. A flexible, non-wicking, FDA approved, nylon fabric reinforced synthetic elastomer diaphragm shall be integral with this assembly to form a sealed chamber, operating free of drag or wear. The diaphragm shall not be used as a seating surface. This assembly shall have a stem which is fully guided by separate upper and lower bearings to preclude binding or deflection. When the valve is in the closed position sealing at the seat shall be accomplished by the contact between one edge of a

- securely retained elastomer quad ring and a smooth seat surface. The seat design shall be removable and not have edges that will induce seal cutting, or wear at low flows. The valve body and cover shall be of cast iron. An FDA approved fused epoxy coating shall be applied to the internal and external exposed surfaces of these components after cleaning and degassing. All internal valve components shall be removable and repairable while the valve body remains in the line. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the valve or controls. The valve shall be provided with an externally mounted y-strainer for protection of the control circuit and ball valves to isolate the pilot system from the main valve.
- C. The valve shall be equipped with a 120 VAC solenoid valve to remotely close the altitude valve. The automatic altitude control valve must also be capable of hydraulic closure with minimum tank water elevation of 5 feet and a maximum tank water elevation 23 feet. Normal valve operating range shall be adjustable, with initial setting to open when WSE is 19 feet.
- D. Operation: The valve shall control the filling of a reservoir to an adjustable high-water level. It shall not allow return flow when the pressure at the valve inlet lowers below the reservoir pressure. When the water level lowers to a desired level, the valve shall reopen to fill the tank. The altitude valve shall remain open until the adjustable shutoff point is reached, then close drip tight. The pilot control shall be a diaphragm actuated, 3-way type that operates on the differential force between the height of the water in the reservoir and an adjustable spring. The pilot system shall contain a 3-way, diaphragm actuated accelerator control and adjustable closing speed needle valve.
- E. Material Specification
1. Body & Cover: Ductile Iron
 2. Disc Retainer: Cast Iron
 3. Main Valve Trim: Stainless Steel
 4. End Connections: ANSI 150
 5. Disc: Buna-N Rubber
 6. Diaphragm: Nylon Reinforced Buna-N Rubber
 7. Stem, Nut & Spring: Stainless Steel
 8. Tubing and Fittings: Stainless Steel
- F. Manufacturer
1. Cla-Val Model 90-01/690-01 with Altitude Pilot Control model: CDS6A Part #20354706E, no substitutions allowed.

2.04 GATE VALVES

- A. Valves less than 3 Inches in Size for Clean Water and Air Service
1. Manufacturer's standard bronze
 2. Solid wedge disc
 3. Rising stem
 4. Screwed end

5. Class 150 pounds
 6. Manufacturers shall be one of the following or equal:
 - a. Mueller
 - b. Lunkenheimer Company
- B. Valves 3 Inches in Size and Larger for general service
1. Resilient wedge type in compliance with AWWA C509
 2. Flange, iron body and bonnet rated for 200-pound working pressure.
 3. Provide O-ring seal between valve body and bonnet.
 4. Ductile or cast-iron wedge encapsulated in nitrile rubber and capable of sealing in either flow direction.
 5. Bronze stem with double or triple O-ring or braided packing stem seals
 6. Rising stem configuration with handwheel diameter sized to allow opening of valve with no more than a 40-pound pull.
 7. Coat interior and exterior surfaces of valve body and bonnet with fusion bonded epoxy in accordance with AWWA C550.
 8. Manufacturers shall be one of the following or equal:
 - a. Clow
 - b. American Flow Control

2.05 GENERAL PURPOSE AWWA BUTTERFLY VALVES

- A. Manufacturers shall be one of the following or equal:
1. DeZurik
 2. Henry Pratt Company
- B. Valve Body
1. Material shall be cast iron, ASTM A126, Grade B, or ductile iron, ASTM A536, Grade 65-45-12.
 2. Body Design
 - a. Flanged Body Valves
 - 1) Comply with usage limitations specified in the Butterfly Valve Application Schedule.
 - b. ASME/ANSI B16.1 Class 125 flanges for Class 150B valves, ASME/ANSI B16.1 Class 250 flanges for Class 250B valves
- C. Disc
1. Material shall be cast iron or ductile iron with Type 316 stainless steel edge that matches seat in valve body.
 2. Secure valve disc to shaft by means of smooth-sided, taper or dowel pins, Type 316 stainless steel or Monel.
 3. Extend pins through full diameter of shaft and mechanically secure in place.
- D. Shaft and Bearings
1. Valves 20-inch and less shall have one piece, through disc shaft design.

2. Vee type shaft seal, chevron design
3. Shaft Material for Class 150B Valves shall be Type 316 stainless steel, ASTM A276.
4. Shaft Material for Class 250B Valves shall be Type 17-4 pH stainless steel, ASTM A564.
5. Self-lubricating sleeve type shaft bearings shall be Teflon with stainless steel or fiberglass backing.

E. Seats

1. Seat material shall be EPDM.
2. For valves 20 inches in nominal size and smaller, bond or vulcanize seat into the valve body.
3. Resilient seat shall withstand 75 pound per inch pull when tested in accordance with ASTM D429, Method B.

F. Valve packing shall be EPDM self-adjusting V-type valve packing or chevron-type packing.

2.06 BUTTERFLY VALVE ACTUATORS

A. Manual operators for aboveground valves

1. Totally enclosed worm gear actuator mounted on the valve.

B. Position indication

1. For all aboveground worm gear provide position indication on the actuator enclosure.

2.07 CHECK VALVE

A. This specification covers the design, manufacture, and testing of 2 in. through 48 in. Titan Check Valves suitable for cold working pressures up to 250 psig, in water service.

B. Check valve shall be Titan wafer type, model CV 41-DI, no substitutions allowed.

C. Material Specification

1. Body: Ductile Iron ASTM A536
2. Seat: Buna-N
3. Disc: Stainless Steel

D. The valves shall be certified to NSF/ANSI 61 Drinking Water System Components – Health Effects and certified to be Lead-Free in accordance with NSF/ANSI 372.

E. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.

F. The valves shall have flanges with drilling to ANSI B16.1, Class 125.

- G. Manufacturer shall demonstrate a minimum of five (5) years' experience in the manufacture of resilient, flexible disc check valves with hydraulic cushions.
- H. All valves shall be hydrostatically tested, and seat tested to demonstrate zero leakage. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.

2.08 ELASTOMER DUCKBILL CHECK VALVES

- A. Valves 4 Inch through 24 Inch:
 - 1. Manufacturer:
 - a. Tideflex.
 - b. Model:
 - 1) Series TF-35
 - 2. Valve Design:
 - a. Symmetrical flare
 - b. Curved bill.
 - c. Flange installation
 - 3. Materials:
 - a. Body: 100% elastomer construction
 - b. Galvanized steel flange retaining ring.

2.09 COMBINATION AIR RELEASE VALVE

- A. Dual air valves shall be manufactured to comply with AWWA C-512.
- B. 3 Inch Valves:
 - 1. Manufacturers:
 - a. APCO (DeZurik).
 - 1) Model: Series 147C
 - b. Crispin Valve:
 - 1) Model: AL30

2.10 COATING

- A. Shop coat interior and exterior metal surfaces of valves, except as follows:
 - 1. Interior machined surfaces
 - 2. Surfaces of gaskets and elastomeric seats and stem seals
 - 3. Bearing surfaces
 - 4. Stainless steel surfaces and components
- B. Coating material for potable water applications
 - 1. Coating material shall meet requirements of NSF 61.
- C. Field applied coatings

1. Additional coating of the valve exterior will be required to match the exterior coating system of the tank called for in Section 09 97 14.
 - a. When shop applied finish coating matches field applied coating on adjacent piping, touch up shop coating in damaged areas in accordance with instructions recommended by the paint manufacturer.
 - b. When shop applied coating does not match field coating on adjacent piping, or when damage has occurred to the shop applied coating that requires more than touchup, blast clean valve surfaces or utilize other surface preparation recommended by the manufacturer of the coating material and apply the coating system used for coating adjacent piping.

D. Surface Coatings

1. Interior and exterior surfaces of valves, actuators, and accessories shall be coated with high solids epoxy, per Section 09 97 17.
2. On polished and machined surfaces apply one of the following, or equal, rust-preventive compounds:
 - a. Houghton, Rust Veto 344
 - b. Rust-Oleum, R-9

PART 3 EXECUTION

3.01 EXAMINATION

- A. Required information prior to installation.
1. Install valves after the required submittal on installation has been accepted.
 2. After flanged valves are selected, determine the face-to-face dimensions.
- B. Fabricate piping to lengths considering the face-to-face dimensions.

3.02 INSTALLATION

- A. Install each type of valve in accordance with manufacturers printed instructions.
- B. Clean faces of flanges with wire brush or similar, insert gaskets and bolts, and tighten nuts progressively and uniformly.
- C. Provide incidental work and materials necessary for installation of valves including flange gaskets, flange bolts and nuts, valve boxes and covers, concrete bases, blocking, and protective coating.
- D. Where needed, furnish and install additional valves for proper operation and maintenance of equipment and plant facilities under the following circumstances:
1. Where such additional valves are required for operation and maintenance of the particular equipment furnished by Contractor
 2. Where such additional valves are required as a result of a substitution or change initiated by Contractor

- E. Install Valves with their stems in vertical position above the pipe, except as follows:
 - 1. Butterfly valves, gate valves aboveground, globe valves, ball valves, and angle valves may be installed with their stems in the horizontal position.
 - 2. Buried plug valves with geared operators shall be installed with their stems in a horizontal position.

- F. Install valves so that handles and operators clear obstructions when the valves are operated from fully open to fully closed.

- G. Provide adequate clearance between internal moving valve parts and adjacent appurtenances.

- H. Place top of valve boxes flush with finish grade or as otherwise indicated on the Drawings.

- I. Valves with threaded connections
 - 1. Install valves by applying wrench on end of valve nearest the joint to prevent distortion of the valve body.
 - 2. Apply pipe joint compound and Teflon tape on external (male) threads to prevent forcing compound into valve seat area.

- J. Valves with flanged connections
 - 1. Align flanges and gasket carefully before tightening flange bolts.
 - 2. When flanges are aligned, install bolts and hand tighten.
 - 3. Tighten nuts opposite each other with equal tension before moving to next pair of nuts.

END OF SECTION

SECTION 33 13 13 – WATER STORAGE TANK DISINFECTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Water tank disinfection.
 - 2. Bacteriological testing.

1.02 REFERENCES

- A. American Water Works Association:
 - 1. AWWA C652-19 – Disinfection of Water Storage Facilities.

1.03 SUBMITTALS

- A. Section 01 33 00 – Submittal Procedures: Requirements for submittals.
- B. Disinfection Procedure: Submit procedure description including type of disinfectant to and calculations indicating quantities of disinfectants required to produce specified chlorine concentration in accordance with Section 4 of AWWA C652-19.
- C. Test Reports in accordance with Section 5 of AWWA C652-19: Indicate results of bacteriological and residual chlorine laboratory test reports.
- D. Manufacturer's Certificate:
 - 1. Certify products meet or exceed specified requirements.
 - 2. Certify disinfectants meet or exceed AWWA Standards requirements.
 - 3. Certify all bacteriological testing is done by a California Department of Public Health certified laboratory.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C652-19.
- B. Perform Work in accordance with State of California Standards.
- C. After the tank is filled, samples shall be collected by the Contractor in the presence of the Inspector, for bacteriological testing.
- D. Inspector or other representative of the Owner shall deliver the bacteria test samples to a California DPH certified laboratory.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store disinfectants in cool, dry place away from combustibles such as wood, rags, oils and grease.

- B. Handle disinfectants with caution; protect skin and eyes from contact; avoid breathing vapors; wear gloves, aprons, goggles, and vapor masks.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Furnish personnel working inside tank during disinfection with equipment to comply with Federal and State regulations for work conducted in hazardous atmosphere.
- B. Legal disposal of the chlorinated dosing water shall be the responsibility of the Contractor and shall be performed in a manner satisfactory to and at the approval of the Owner. The approval of the Owner does not relieve the Contractor of the responsibility of adhering to all applicable laws regarding discharge of water to disposal areas or waterways.
- C. Neutralize disinfectant solution before disposal.
- D. Repair damage caused by disinfectant solution and disinfection procedures.

PART 2 PRODUCTS

2.01 DISINFECTANTS

- A. Chlorine Forms: In accordance with AWWA C652-19, Section 4.
- B. The Contractor shall furnish and install the necessary corporation cocks and appurtenances that may be required to accomplish adequate disinfection.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Conduct inspection of tank interior before beginning disinfection.
 - 1. Verify tank is clean and free of polluting materials.
 - 2. Verify tank pipe and vent connections are properly made and clear of obstructions.
 - 3. Verify coatings are thoroughly cured in accordance with paint manufacturer's instructions.

3.02 PREPARATION

- A. Protect aquatic life and vegetation from damage from disinfectant solution purged from tank.

3.03 APPLICATION

- A. Chlorination Method 2 as specified in Section 4 of AWWA C652-02-19.

3.04 FIELD QUALITY CONTROL

- A. Collect samples of water from filled tank for bacteriological analysis in accordance with Section 5 of AWWA C652-19; take inlet and outlet water samples.
- B. Test water samples for bacterial contamination and residual chlorine in accordance with State Health Standards for potable water.
- C. When water samples fail to meet State Health Standards for potable water perform the following corrective measures until water quality conforms to State Health Standards:
 - 1. Inlet and Outlet Water Sample Failure: Eliminate source of contamination in water supply, repeat disinfection, and retest water quality.
 - 2. Outlet Water Sample Failure: Repeat disinfection, and retest water quality.

END OF SECTION

SECTION 33 16 96 – WATER STORAGE TANK APPURTENANCES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
1. Level indicator
 2. Sampling Station

1.02 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 LEVEL INDICATOR

- A. General
1. Level Indicator shall be Varec 6700 or approved equal.
 2. Level Indicator shall be of full travel design with accuracy to 1-inch.
 3. An exterior 3/8-inch x 3-7/16-inch x 7-inch Plate
 4. C7x9.8 Level Indicator Board with all surfaces painted white.
 5. 4-inch x 1/2-inch indicator marks at each foot.
 6. 2-inch x 1/2-inch indicator marks at each half foot.
 7. 4-inch high x 1/2-inch black numerals
 8. Target shall be 3/16-inch x 5 1/2-inch x 8 3/8-inch. All surfaces shall be white except shaded area which is to be painted with red enamel.
 9. 1/16-inch diameter stainless steel cable.
 10. 3/32-inch diameter stainless steel guide wire.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Anchor components securely to tank and install per manufacturer's written instructions.

END OF SECTION

SECTION V

CONSTRUCTION AGREEMENT

CONSTRUCTION AGREEMENT

FY _____ Fund _____ Cost Center _____ Object Code _____ Project # _____ Amount \$ _____

For multi-year contracts or contracts with multiple accounts:

FY _____ Fund _____ Cost Center _____ Object Code _____ Project # _____ Amount \$ _____

FY _____ Fund _____ Cost Center _____ Object Code _____ Project # _____ Amount \$ _____

FY _____ Fund _____ Cost Center _____ Object Code _____ Project # _____ Amount \$ _____

THIS AGREEMENT is dated as of the _____ day of _____ in the year 20____, by
(city use only)

and between CITY OF PETALUMA (hereinafter called "CITY") and _____ (hereinafter called "CONTRACTOR").

CITY and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

CONTRACTOR shall complete the WORK as specified or indicated in the CITY’S Contract Documents entitled _____.

ARTICLE 2. COMPLETION OF WORK

The WORK shall be completed to the satisfaction of CITY within _____ (_____) working days from the commencement date stated in the Notice to Proceed. In no event, however, shall the WORK to be performed under this contract be considered to be complete until all construction items called for on the drawings, and specifications have been completed and the contract price paid in full.

ARTICLE 3. LIQUIDATED DAMAGES

A. CITY and the CONTRACTOR recognize that time is of the essence of this Agreement and that the CITY will suffer financial loss if the WORK is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage which the CITY will sustain in the event of and by reason of the CONTRACTOR’s failure to fully perform the WORK or to fully perform all of its contract obligations that have accrued by the time for completion as specified in Article 2 herein and/or as specified for completion of any scheduled operations or works described in the Special Provisions. It is, therefore, agreed in accordance with California Government Code Section 53069.85 that the CONTRACTOR will forfeit and pay to the CITY liquidated damages in the sum of _____ Dollars (\$_____) per day for each and every calendar day that expires after the time for completion specified in Article 2 herein and/or as specified for completion of any scheduled operations or works described in the Special Provisions except as

otherwise provided by extension of time pursuant to Article 12 of the General Conditions. It is further understood and agreed in accordance with California Government Code Section 53069.85 that the liquidated damages sum specified in this provision is not manifestly unreasonable under the circumstances existing at the time this contract was made, and that the CITY may deduct liquidated damages sums in accordance with this provision from any payments due or that may become due the CONTRACTOR.

- B. Liquidated damages will continue to accrue at the stated rate until final completion of the WORK. Accrued liquidated damages may be deducted by the CITY from amounts due or that become due to the CONTRACTOR for performance of the WORK. Liquidated damages may not be waived or reduced by CITY unless expressly waived or reduced in writing by the ENGINEER.

ARTICLE 4. PREVAILING WAGES

- A. Pursuant to California Labor Code Section 1771, CONTRACTOR and any subcontractor shall pay all workers employed in execution of the WORK in accordance with the general rate of per diem wages specified for each craft, classification, or type of worker needed to execute the WORK. Copies of the prevailing rates of per diem wages are on file at the City Clerk's office and shall be made available to any interested party on request.
- B. CONTRACTOR is required to pay all applicable penalties and back wages in the event of violation of prevailing wage law, and CONTRACTOR and any subcontractor shall fully comply with California Labor Code Section 1775, which is incorporated by this reference as though fully set forth herein.
- C. CONTRACTOR and any subcontractor shall maintain and make available for inspection payroll records as required by California Labor Code Section 1776, which is incorporated by this reference as though fully set forth herein. CONTRACTOR is responsible for ensuring compliance with this section. CONTRACTOR and any subcontractor shall maintain and make available for inspection payroll records as required by California Labor Code Section 1776, which is incorporated by this reference as though fully set forth herein. CONTRACTOR is responsible for ensuring compliance with this section. In addition, CONTRACTOR and any subcontractor shall submit certified payroll records to the Labor Commissioner online: <http://www.dir.ca.gov/Public-Works/Certified-Payroll-Reporting.html>.
- D. CONTRACTOR and any subcontractor shall fully comply with California Labor Code Section 1777.5, concerning apprentices, which is incorporated by this reference as though fully set forth herein. CONTRACTOR is responsible for ensuring compliance with this section.
- E. In accordance with California Labor Code Section 1810, eight (8) hours of labor in performance of the WORK shall constitute a legal day's work under this Agreement. CONTRACTOR and any subcontractor shall pay workers overtime pay as required by California Labor Code Section 1815. CONTRACTOR and any subcontractor shall, as a penalty to the CITY, forfeit Twenty-Five Dollars (\$25) for each worker employed in the

execution of the contract by the respective contractor or subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation so the provisions of Article 3 of Chapter 1 of Part 7, Division 2 of the California Labor Code, which is incorporated by this reference as though fully set forth herein.

ARTICLE 5. CONTRACT PRICE

- A. CITY shall pay CONTRACTOR for completion of the WORK the sum of _____ Dollars (\$_____), based on the bid price of same and in accordance with the Contract Documents.
- B. Notwithstanding any provisions herein, CONTRACTOR shall not be paid any compensation until such time as CONTRACTOR has on file with the City Finance Department a current W-9 form available from the IRS website (www.irs.gov) and has obtained a currently valid Petaluma business license pursuant to the Petaluma Municipal Code.
- C. In no case shall the total contract compensation exceed _____ Dollars (\$_____) without the prior written authorization by the City Manager. Further, no compensation for a section or work program component attached with a specific budget shall be exceeded without the prior written authorization of the City Manager.

ARTICLE 6. BONDS

- A. Before entering upon the performance of the WORK, the CONTRACTOR shall furnish Performance and Labor and Materials Bonds, each in the amount of one hundred percent (100%) of the contract price, as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date of Completion, except as otherwise provided by Law or Regulation or by the Contract Documents. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions.
- B. The CONTRACTOR shall guarantee the WORK to be free of defects in material and workmanship for a period of one (1) year following the CITY's acceptance of the WORK. The CONTRACTOR shall agree to make, at the CONTRACTOR's own expense, any repairs or replacements made necessary by defects in material or workmanship which become evident within the one-year guarantee period. The CONTRACTOR's guarantee against defects required by this provision shall be secured by a Maintenance Bond, in the amount of ten percent (10%) of the contract price, which shall be delivered by the CONTRACTOR to the CITY prior to acceptance of the WORK. The Maintenance Bond shall remain in force for one (1) year from the date of acceptance of the contracted WORK. The CONTRACTOR shall make all repairs and replacements within the time required during the guarantee period upon receipt of written order from the ENGINEER. If the CONTRACTOR fails to make the repairs and replacements within the required time, the CITY may do the work and the CONTRACTOR and the

CONTRACTOR's surety for the Maintenance Bond shall be liable to the CITY for the cost. The expiration of the Maintenance Bond during the one-year guarantee period does not operate to waive or void the one-year guarantee, as set forth herein.

- C. The form of the Performance, Labor and Materials, and Maintenance Bonds are provided by the CITY as part of the Contract Documents. Only such bond forms provided by the CITY are acceptable and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.
- D. If the surety on any Bond furnished by the CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days thereafter substitute another Bond and surety, which must be acceptable to the CITY.
- E. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the State of California to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

ARTICLE 7. PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

ARTICLE 8. RETENTION

- A. Pursuant to Section 22300 of the California Public Contract Code, the CONTRACTOR may substitute securities for any money withheld by the CITY to ensure performance under the Contract. At the request and expense of the CONTRACTOR, securities equivalent to the amount withheld shall be deposited with the CITY or with a state or federally chartered bank in California as to the escrow agent, who shall return such securities to the CONTRACTOR upon satisfactory completion of the Contract.
- B. Alternatively, the CONTRACTOR may request and the CITY shall make payment of retentions earned directly to the escrow agent at the expense of the CONTRACTOR. At the expense of the CONTRACTOR, the CONTRACTOR may direct the investment of the payments into securities and the CONTRACTOR shall receive the interest earned on the investments upon the same terms provided for in this section for securities deposited by the CONTRACTOR. The CONTRACTOR shall be responsible for paying all fees for the expenses incurred by the escrow account and all expenses of the CITY. These expenses and payment terms shall be determined by the CITY's Finance Director or his/her designee and the escrow agent. Upon satisfactory completion of the Contract, the

CONTRACTOR shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the CITY, pursuant to the terms of this section. The CONTRACTOR shall pay to each subcontractor, not later than 20 days of receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to ensure the performance of the CONTRACTOR.

- C. Securities eligible for investment under Section 22300 shall be limited to those listed in Section 16430 of the Government Code and to bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the CONTRACTOR and the CITY.

ARTICLE 9. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between the CITY and the CONTRACTOR concerning the WORK consist of this Agreement and the following attachments to this Agreement:

- Notice Inviting Bids
- Instructions to Bidders
- Bid Forms including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates and affidavits
- Labor and Materials Bond
- Performance Bond
- Maintenance Bond
- General Conditions
- Supplementary General Conditions (if any)
- Specifications
- Special Provisions
- Drawings
- Federal Wage Rates dated _____ (if applicable)
- Form FHWA-1273 (if applicable)
- Addenda (if any)
- Change Orders which may be delivered or issued after Effective Date of the Agreement and are not attached hereto.

There are no Contract Documents other than those listed in this Article 9. The Contract Documents may only be amended by Change Order as provided in Paragraph 3.5 of the General Conditions.

ARTICLE 10. INSURANCE

The applicable insurance requirements, as approved by the City's Risk Manager, are set forth in **Exhibit B**, attached hereto and incorporated by reference herein. *[City use: check one.]*

ARTICLE 11. INDEMNIFICATION

- A. CONTRACTOR shall indemnify, defend with counsel acceptable to CITY, and hold harmless to the full extent permitted by law, CITY and its officers, officials, employees, agents and volunteers from and against any and all alleged liability, loss, damage, claims, expenses and costs (including, without limitation, attorney fees and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with CONTRACTOR's performance of the WORK or its failure to comply with any of its obligations contained in this Agreement, except such Liability caused by the active negligence, sole negligence or willful misconduct of the CITY. Such indemnification by the CONTRACTOR shall include, but not be limited to, the following:
1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR, its subcontractors, employees, or agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR, its employees, or agents;
 2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the CONTRACTOR's, or Supplier's own employees, or agents engaged in the WORK resulting in actions brought by or on behalf of such employees against the CITY and/or the ENGINEER;
 3. Liability or claims arising directly or indirectly from or based on the violation of any Laws or Regulations, whether by the CONTRACTOR, its subcontractors, employees, or agents;
 4. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its subcontractors, employees, or agents in the performance of this Agreement of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specified stipulated in this Agreement;
 5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the CITY or any other parties by the CONTRACTOR, its subcontractors, employees, or agents;
 6. Liability or claims arising directly or indirectly from the willful misconduct of the CONTRACTOR, its subcontractors, employees, or agents;
 7. Liability or claims arising directly or indirectly from any breach of the obligations assumed in this Agreement by the CONTRACTOR;
 8. Liability or claims arising directly or indirectly from, relating to, or resulting from a hazardous condition created by the CONTRACTOR, Subcontractors, Suppliers, or any of their employees or agents, and;
 9. Liability or claims arising directly, or indirectly, or consequentially out of any action, legal or equitable, brought against the CITY, the ENGINEER, their consultants, subconsultants, and the officers, directors, employees and agents of each or any of them, to the extent caused by the CONTRACTOR's use of any premises acquired by permits, rights of way, or easements, the Site, or any land or area contiguous thereto or its performance of the WORK thereon.

- B. The CONTRACTOR shall reimburse the CITY for all costs and expenses, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs of appeal) incurred by said CITY in enforcing the provisions of this Paragraph.
- C. The indemnification obligation under this Article 11 shall be in addition to, and shall not be limited in any way by any limitation on the amount or type of insurance carried by CONTRACTOR 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 workers' compensation acts, disability benefit acts, or other employee benefit acts. The CONTRACTOR's responsibility for such defense and indemnity obligations shall survive the termination or completion of this Agreement for the full period of time allowed by law.
- D. Pursuant to California Public Contract Code Section 9201, City shall timely notify Contractor of receipt of any third-party claim relating to this Agreement.

ARTICLE 12. DISCLAIMER AND INDEMNITY
CONCERNING LABOR CODE SECTION 6400

By executing this agreement the CONTRACTOR understands and agrees that with respect to the WORK, and notwithstanding any provision in this contract to the contrary, the CONTRACTOR, and/or its privities, including, without limitation, subcontractors, suppliers and other engaged by the CONTRACTOR in the performance of the WORK shall be "employers" for purposes of California Labor Code Section 6400 and related provisions of law, and that neither CITY nor its officials, officers, employees, agents, volunteers or consultants shall be "employers" pursuant to California Labor Code Section 6400 with respect to the performance of the WORK by the CONTRACTOR and/or its privities.

The CONTRACTOR shall take all responsibility for the WORK, shall bear all losses and damages directly or indirectly resulting to the CONTRACTOR, any subcontractors, the CITY, its officials, officers, employees, agents, volunteers and consultants, on account of the performance or character of the WORK, unforeseen difficulties, accidents, or occurrences of other causes predicated on active or passive negligence of the CONTRACTOR or of any subcontractor, including, without limitation, all losses, damages or penalties directly or indirectly resulting from exposure to hazards in performance of the WORK in violation of the California Labor Code. The CONTRACTOR shall indemnify, defend and hold harmless the CITY, its officials, officers, employees, agents, volunteers and consultants from and against any or all losses, liability, expense, claim costs (including costs of defense), suits, damages and penalties (including, without limitation, penalties pursuant to the California Labor Code) directly or indirectly resulting from exposure to hazards in performance of the WORK in violation of the California Labor Code, except such liability or costs caused by the active negligence, sole negligence or willful misconduct of the CITY.

ARTICLE 13. INDEPENDENT CONTRACTOR

It is understood and agreed that in the performance of this Agreement, CONTRACTOR (including its employees and agents) is acting in the capacity of an independent contractor, and not as an agent or employee of the CITY. CONTRACTOR has full control over the means and methods of performing said services and is solely responsible for its acts and omissions, including the acts and omissions of its employees and agents.

ARTICLE 14. SUBCONTRACTORS

CONTRACTOR must obtain the CITY’s prior written consent for subcontracting any WORK pursuant to this Agreement. Any such subcontractor shall comply, to the extent applicable, with the terms and conditions of this Agreement. Any agreement between CONTRACTOR and a subcontractor pursuant to this Agreement shall provide that the subcontractor procure and maintain insurance coverage as required herein and which shall name CITY as an additional insured.

ARTICLE 15. COMPLIANCE WITH LAWS/NON-DISCRIMINATION

CONTRACTOR shall comply with all applicable local, state and federal laws, regulations and ordinances in the performance of this Agreement. CONTRACTOR shall not discriminate in the provision of service or in the employment of persons engaged in the performance of this Agreement on account of race, color, national origin, ancestry, religion, gender, marital status, sexual orientation, age, physical or mental disability in violation of any applicable local, state or federal laws or regulations.

ARTICLE 16. NOTICES

All notices required or permitted by this Agreement, including notice of change of address, shall be in writing and given by personal delivery or sent postage prepaid and addressed to the parties intended to be notified, as set forth herein. Notice shall be deemed given as of the date of delivery in person or as of the date deposited in any post office or post office box regularly maintained by the United States Postal Service, unless otherwise stated herein. Notice shall be given as follows:

CITY: City Clerk
City of Petaluma
Post Office Box 61
Petaluma, California 94953
Telephone: (707) 778-4360

CONTRACTOR: _____
(Contact Name)

(Business Name)

(Address)

(City, State, Zip)

(Telephone)

(E-mail)

ARTICLE 17. GOVERNING LAW/VENUE

This Agreement shall be construed and its performance enforced under California law. Venue shall be in the Superior Court of the State of California in the County of Sonoma.

ARTICLE 18. NON-WAIVER

The CITY's failure to enforce any provision of this Agreement or the waiver of any provision in a particular instance shall not be construed as a general waiver of any part of such provision. The provision shall remain in full force and effect.

ARTICLE 19. THIRD PARTY BENEFICIARIES

The Parties do not intend, by any provision of this Agreement, to create in any third party any benefit or right owed by one party, under the terms and conditions of this Agreement, to the other party.

ARTICLE 20. ASSIGNMENT

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

CITY and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

ARTICLE 21. SEVERABILITY

If any term or portion of this Agreement is held to be invalid, illegal, or otherwise enforceable by a court of competent jurisdiction, the remaining provisions of this Agreement shall continue in full force and effect.

IN WITNESS WHEREOF, CITY and CONTRACTOR have caused this Agreement to be executed the day and year first above written.

CITY

CONTRACTOR _____

City Manager

By _____
(CORPORATE SEAL)

ATTEST:

Attest: _____

City Clerk

Address for giving notices:

APPROVED AS TO FORM:

City Attorney

Agent for service of process:

License Number

Taxpayer I.D. Number

Petaluma Business Tax Certificate Number

file name:

END OF AGREEMENT

AGREEMENT CERTIFICATE
(if Corporation)

STATE OF CALIFORNIA)
) ss:
COUNTY OF)

I HEREBY CERTIFY that a meeting of the Board of Directors of the _____
_____ a
corporation existing under the laws of the State of _____, held on
_____, 20____, the following resolution was duly passed and adopted:

“RESOLVED, that _____, as _____
President of the Corporation, be and is hereby authorized to execute the
Agreement dated _____, 20____, by and between
this Corporation and _____ and that his/her execution
thereof, attested by the Secretary of the Corporation, and with the Corporate Seal
affixed, shall be the official act and deed of this Corporation.”

I further certify that said resolution is now in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of
the corporation this _____, day of _____, 20_____.

Secretary

(SEAL)

FAITHFUL PERFORMANCE BOND

WHEREAS, the City Council of the City of Petaluma, State of California, and _____ (hereinafter designated as "Principal") have entered into an agreement whereby Principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20_____, and identified as project _____, is hereby referred to and made a part hereof; and,

WHEREAS, said Principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement.

NOW, THEREFORE, WE, the Principal and _____, duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the City of Petaluma, hereinafter called "City," in the penal sum of _____ Dollars (\$_____) lawful money of the United States, for payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors, and administrators, jointly and severally, firmly by these present. The conditions of this obligation are such that if the above-bound Principal, the Principal's heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and provisions in the said agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City of Petaluma, its officers, agents, employees, and volunteers, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of this obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by the City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of this agreement or to the work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

And the said Surety, for value received, hereby stipulates and agrees that upon termination of the Contract for cause, the Obligee reserves the right to refuse tender of the Principal by the Surety to complete the Contract work.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety above named, on _____, 20_____.

PRINCIPAL

SURETY

By _____

By _____

Name and Title

Name and Title

Address

City State Zip

Phone Number

###

NOTE: No substitution or revision to this bond form will be accepted. Be sure that all bonds submitted have a certified copy of the bonding agent's power of attorney attached. Also verify that Surety is an "Admitted Surety" (i.e., qualified to do business in California), and attach proof of verification (website printout from the California Department of Insurance website (<http://www.insurance.ca.gov/docs/index.html>) or certificate from County Clerk).

APPROVED AS TO AMOUNT:

APPROVED AS TO FORM:

City Manager

City Attorney

END OF FAITHFUL PERFORMANCE BOND

LABOR AND MATERIALS BOND

WHEREAS, the City of Petaluma, State of California, and _____ (hereinafter designated as “Principal”) have entered into an agreement whereby the Principal agrees to install and complete certain designated public improvements, which said agreements, dated _____, 20____, and identified as project _____, is hereby referred to and made a part hereof; and,

WHEREAS, under the terms of said agreement Principal is required before entering upon the performance of the work, to file a good and sufficient payment bond with the City of Petaluma, to secure the claims to which reference is made in Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California.

NOW, THEREFORE, said Principal and the undersigned, duly authorized to transact business under the laws of the State of California, as corporate surety, are held firmly bound unto the City of Petaluma, and all contractors, subcontractors, laborers, materialmen and other persons employed in the performance of the aforesaid agreement and referred to in the aforesaid Civil Code of the State of California, in the sum of _____ Dollars (\$_____) for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, that said surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Title 15 (commencing with section 3082) of Part 4 of Division 3 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

THE SURETY hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said agreement or the specifications accompanying the same shall in any

manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and surety above named, on _____, 20_____.

PRINCIPAL

SURETY

By _____

By _____

Name and Title

Name and Title

Address

City

State

Zip

Phone

###

NOTE: No substitution or revision to this bond form will be accepted. Be sure that all bonds submitted have a certified copy of the bonding agent's power of attorney attached. Also verify that Surety is an "Admitted Surety" (i.e., qualified to do business in California), and attach proof of verification (website printout from the California Department of Insurance website (<http://www.insurance.ca.gov/docs/index.html>) or certificate from County Clerk)..

APPROVED AS TO AMOUNT:

APPROVED AS TO FORM:

City Manager

City Attorney

END OF LABOR AND MATERIALS BOND

MAINTENANCE BOND

WHEREAS, the City Council of the City of Petaluma (“City”) and _____, (hereinafter designated as “Principal”) have entered into an agreement whereby Principal agrees to install and complete certain designated public improvements, which said agreement, dated _____, 20_____, and identified as project _____, is hereby referred to and made a part hereof; and,

WHEREAS, said Principal is required under the terms of said contract to furnish a maintenance bond for the correction of any defects due to defective materials or workmanship in the work performed under said agreement.

NOW, THEREFORE, we the Principal and _____ as Surety, are held and firmly bound unto the City of Petaluma in the penal sum of _____ Dollars (\$_____), lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if, during a maintenance period of one (1) year from the date of acceptance of the contracted work, the Principal upon receiving written notice of a need for repairs which are directly attributable to defective materials or workmanship, shall diligently take the necessary steps to correct said defects within seven (7) days from the date of said notice, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

As part of this obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorney’s fees, incurred by the City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of this agreement or to the work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety above named, on _____, 20_____.

PRINCIPAL

SURETY

By_____

By_____

Name and Title

Name and Title

Address

City State Zip

Phone Number

###

NOTE: No substitution or revision to this bond form will be accepted. Be sure that all bonds submitted have a certified copy of the bonding agent’s power of attorney attached. Also verify that Surety is an “Admitted Surety” (i.e., qualified to do business in California), and attach proof of verification (website printout from the California Department of Insurance website (<http://www.insurance.ca.gov/docs/index.html>) or certificate from County Clerk).

APPROVED AS TO AMOUNT:

APPROVED AS TO FORM:

City Manager

City Attorney

END OF MAINTENANCE BOND

SECTION VI

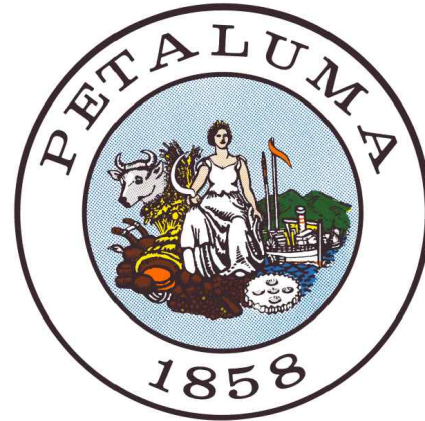
PLANS

City of Petaluma, California

HARDIN LANE TANK REHABILITATION

HARDIN LANE

C67502328

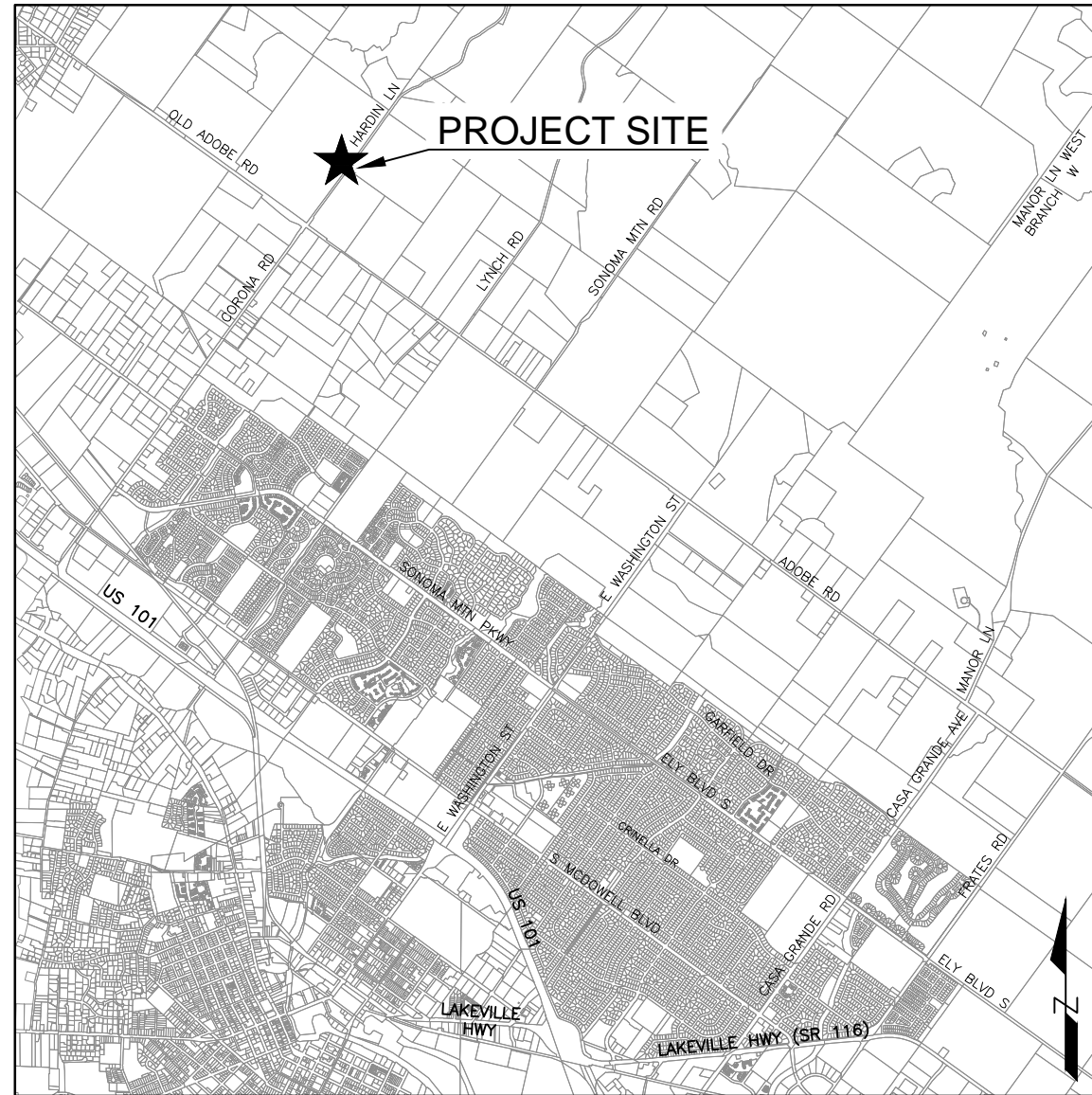


MAYOR
Kevin McDonnell

COUNCIL MEMBERS
John Shribbs, Vice Mayor
Brian Barnacle
Mike Healy
Karen Nau
Dennis Pocekay
Janice Cader Thompson

CITY MANAGER
Peggy Flynn

DIRECTOR OF PUBLIC WORKS & UTILITIES
Gina Benedetti-Petnic, Interim



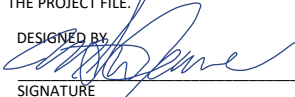
LOCATION MAP
SCALE: NOT TO SCALE

DRAWING INDEX

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ALL PROJECT PLANS HAVE BEEN PREPARED AND REVIEWED TO COMPLY WITH CURRENT AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS AND/OR THE CALIFORNIA BUILDING STANDARDS CODE (CBCS).

THESE PROJECT PLANS CONTAIN ELEMENT(S) THAT ARE NOT "TECHNICALLY FEASIBLE" AND/OR CAN'T MEET THE APPLICABLE CBCS BECAUSE IT WOULD CREATE AN "UNREASONABLE HARDSHIP." PLEASE SEE THE WRITTEN ANALYSIS SUPPORTING THIS DETERMINATION FILED UNDER THE PROJECT FILE.

DESIGNED BY: 
SIGNATURE

4/25/24
DATE

DocuSigned by:
APPROVED BY: 
GINA PETNIC-BENEDETTI P.E. C42778
ASSISTANT DIRECTOR OF PUBLIC WORKS & UTILITIES

DESIGNED BY: 
M. SEAN JEANE P.E. C52402 EXP. 12/31/2024
SENIOR PRINCIPAL

RECORD PLAN

I _____ HEREBY STATE THAT THESE RECORD PLAN CHANGES ARE COMPLETE FROM INFORMATION FURNISHED BY THE PROJECT CONTRACTOR, SOILS ENGINEER AND MY OFFICE. I HEREBY STATE THAT TO THE BEST OF MY KNOWLEDGE THE THE WORK WAS DONE IN ACCORDANCE WITH THE FINAL APPROVED PLANS. THE ENGINEER AND THE CITY WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT. FIELD VERIFICATION OF CRITICAL FACTS AND DATA SHOULD BE MADE IF THESE DOCUMENTS ARE TO BE USED AS A BASIS FOR FUTURE WORK. ENGINEER'S SIGNATURE _____ DATE: _____

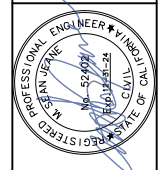
TAB: 1-COVER

475A.dwg 4754 02 4754.02 COVER.dwg
erickson 04-25-24

	SIGNATURE	DATE
CITY ENGINEER		
ENGINEERING MANAGER		
FIRE MARSHAL		
PARKS		
PLANNING		
POLICE		
UTILITY MANAGER		

DATE: APRIL 2024
DESIGNED BY: SMJ
DRAWN BY: PIT
CHECKED BY: SMJ

PROJECT NO.
4754.02



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CONSULTING CIVIL ENGINEERS
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CITY OF PETALUMA
PUBLIC WORKS & UTILITIES
202 N. McDowell Blvd., PETALUMA, CALIFORNIA, 94954
PH. 707-778-4546 FAX. 707-778-4508



HARDIN LANE TANK REHABILITATION

COVER

SHEET
1
1 OF 12

ABBREVIATIONS

AB	AGGREGATE BASE	MISC	MISCELLANEOUS
AC	ASPHALT CONCRETE	MJ	MECHANICAL JOINT
ACP	ASBESTOS CEMENT PIPE	MSL	MEAN SEA LEVEL
ADPT	ADAPTER	N	NORTH
ALUM	ALUMINUM	(N)	NEW
APPROX	APPROXIMATE	NO	NUMBER
ARV	AIR RELEASE VALVE	NA	NOT APPLICABLE
BM	BENCHMARK	NPT	NATIONAL PIPE THREAD
BO	BLOWOFF	NRS	NON RISING STEM
BV	BUTTERFLY VALVE	NS	NEAR SIDE
BW	BOTTOM OF WALL	OC	ON CENTER
B&R	BRELJE & RACE	OD	OUTSIDE DIAMETER
CAV	COMBINATION AIR & VACUUM RELEASE VALVE	OH	OVERHEAD
CB	CATCH BASIN	PC	POINT OF CURVATURE
CBC	CALIFORNIA BUILDING CODE	PCC	POINT OF COMPOUND CURVATURE
CIPP	CAST-IN-PLACE PIPE	PCC	PORTLAND CEMENT CONCRETE
C	CENTERLINE	PD	PLANTER DRAIN
CL	CLASS	PE	PLANE END
CLR	CLEAR	PG	PAD GRADE
CMP	CORRUGATED METAL PIPE	PIV	POST INDICATOR VALVE
CO	CLEANOUT	POT	POINT ON TANGENT
CONC	CONCRETE	PP	POWER POLE
COND	CONDUIT	PSI	POUND PER SQUARE INCH
CP	CONTROL POINT	PUE	PUBLIC UTILITY EASEMENT
CPLG	COUPLING	PVC	POLYVINYL CHLORIDE
CSP	CORRUGATED STEEL PIPE	PVMT	PAVEMENT
CTR	CENTER	R	RADIUS
CY	CUBIC YARDS	RC	RELATIVE COMPACTION
C/C	CENTER TO CENTER	RCB	REINFORCED CONCRETE BOX
C&G	CURB AND GUTTER	RCP	REINFORCED CONCRETE PIPE
DEG	DEGREES	RD	ROAD
DI	DROP INLET	RED	REDUCER
DIA	DIAMETER	REF	REFERENCE
DIP	DUCTILE IRON PIPE	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
DR	DRIVE	RT	RIGHT
DS	DOWNSTREAM	RW	RECLAIMED WATER
DWG	DRAWING	R/W	RIGHT OF WAY
D/W	DRIVEWAY	S	SOUTH
E	EAST	S	SLOPE
(E)	EXISTING	SCH	SCHEDULE
ECC	ECCENTRIC	SD	STORM DRAIN
EG	EXISTING GROUND	SDCB	STORM DRAIN CATCH BASIN
EL	ELEVATION	SDCO	STORM DRAIN CLEANOUT
ELEC	ELECTRICAL	SDDI	STORM DRAIN DROP INLET
ELL	ELBOW	SDE	STORM DRAIN EASEMENT
EP	EDGE OF PAVEMENT	SDMH	STORM DRAIN MANHOLE
ESMT	EASEMENT	SF	SQUARE FEET
EW	EACH WAY	SOF	SLIP ON FLANGE
FC	FACE OF CURB	SO	SIDE OPENING (SD)
FCA	FLANGED COUPLING ADAPTER	SPEC	SPECIFICATION
FF	FINISHED FLOOR	SS	STAINLESS STEEL
FG	FINISHED GRADE	SS	SANITARY SEWER
FH	FIRE HYDRANT	SSCO	SANITARY SEWER CLEANOUT
FL	FLOWLINE	SSMH	SANITARY SEWER MANHOLE
FL	FLOWLINE	ST	STREET
FLG	FLANGE	STA	STATION
FLEX	FLEXIBLE	STD	STANDARD
FM	FORCE MAIN (PRESSURE)	STL	STEEL
FS	FAR SIDE	SY	SQUARE YARDS
FT	FEET	S/W	SIDEWALK
GALV	GALVANIZED	TB	TOP OF BOX
GB	GRADE BREAK	TCE	TEMPORARY CONSTRUCTION EASEMENT
GRD	GROUND	TEL	TELEPHONE
GSP	GALVANIZED STEEL PIPE	TEMP	TEMPORARY
GV	GAS VALVE	TG	TOP OF GRATE
GV	GATE VALVE	THD	THREADED
HB	HOSE BIBB	TW	TOP OF WALL
HDG	HOT DIPPED GALVANIZED	TYP	TYPICAL
HDPE	HIGH DENSITY POLYETHYLENE	UNO	UNLESS NOTED OTHERWISE
HWY	HIGHWAY	W	WEST
ID	INSIDE DIAMETER	W	WATER
INV	INVERT	WM	WATER METER
IP	IRON PIPE	WNF	WELD NECK FLANGE
IPS	IRON PIPE SIZE	WS	WATER SERVICE
IRR	IRRIGATION	WT	WEIGHT
JP	JOINT POLE	WV	WATER VALVE
JT	JOINT TRENCH	.	DEGREES
L	LENGTH	'	MINUTES
LF	LINEAL FEET	"	SECONDS
LP	LOW POINT	Δ	DELTA
LT	LEFT	&	AND
MAX	MAXIMUM	@	AT
MFR	MANUFACTURE	#	NUMBER
MG	MILLION GALLONS	#	POUNDS
MH	MANHOLE	%	PERCENT
MIN	MINIMUM		

LEGEND

LINES

BOUNDARY	-----
PARCEL	=====
CENTER	-----
EASEMENT	-----

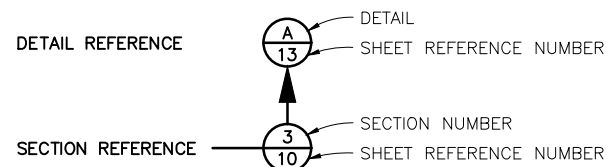
UTILITY LINES

	EXISTING	PROPOSED
STORM DRAIN	24" SD	24" SD
WATER	8" W	8" W
SEWER	12" SS	12" SS
GAS	3" G	
ELECTRICAL	E	12, KV
TELEPHONE	T	
TELEVISION	TV	
JOINT TRENCH	JT	

TOPOGRAPHY

WATER METER	□ ^{WM}	□ ^{WM}
DROP INLET	□	□
WATER VALVE	⊕	⊕
BLOWOFF	⊖	⊖
FIRE HYDRANT	⊕ ^{FX}	⊕ ^{FX}
GAS METER	□ ^{GM}	□ ^{GM}
STORM DRAIN MANHOLE	⊕ ^{SD}	⊕ ^{SD}
STORM DRAIN CATCH BASIN	⊕ ^{SDCB}	⊕ ^{SDCB}
SEWER MANHOLE	⊕ ^S	⊕ ^S
SEWER CLEANOUT	⊕ ^{SCO}	⊕ ^{SCO}
JOINT POLE	⊕ ^{JP}	⊕ ^{JP}
LIGHT STANDARD	⊕ ^{LS}	⊕ ^{LS}
GUY/ANCHOR	⊕ ^G	⊕ ^G
CURB & GUTTER	=====	=====
AC DIKE	=====	=====
FENCE	—x—x—	—x—x—
CHAIN LINK FENCE	—o—o—	—o—o—
DITCH/SWALE	—- - - -	—- - - -
MONUMENT	●	●
TREE PROTECTION	— TP —	— TP —
TREE TO BE SAVED	△	△
TREE TO BE REMOVED	⊗	⊗

SYMBOLS



GENERAL NOTES

- ANY DISCREPANCY DISCOVERED BY CONTRACTOR IN THESE PLANS OR ANY FIELD CONDITIONS DISCOVERED BY CONTRACTOR THAT MAY DELAY OR OBSTRUCT THE PROPER COMPLETION OF THE WORK PER THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND THE OWNER IMMEDIATELY UPON DISCOVERY. SAID NOTIFICATION SHALL BE IN WRITING.
- CONTRACTOR SHALL GIVE THE CITY OF PETALUMA 10 CALENDAR DAYS NOTICE BEFORE COMMENCING WITH THE WORK.
- CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND CONTRACTOR FURTHER AGREES TO HOLD HARMLESS, INDEMNIFY AND DEFEND THE OWNER, THE ENGINEER AND HIS CONSULTANTS, AND EACH OF THEIR OFFICERS, EMPLOYEES AND AGENTS.
- CONTRACTOR SHALL INDEPENDENTLY REVIEW GROUND, TOPOGRAPHY, AND EXISTING FACILITIES THROUGHOUT THE SITE, AND ASSUME WHOLLY AND UNCONDITIONALLY THE RISK OF COMPLETING THE WORK SET OUT ON THESE PLANS.
- ANY EXCESS AND UNSUITABLE MATERIALS SHALL BE CONSIDERED THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF AWAY FROM THE JOB SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING NOISE, ODORS, DUST AND DEBRIS TO MINIMIZE IMPACTS ON SURROUNDING ROADWAYS AND PROPERTIES TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF PETALUMA.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION EQUIPMENT IS EQUIPPED WITH MANUFACTURER APPROVED MUFFLERS/BAFFLES. WARM-UP TIMES SHALL BE MINIMIZED AND ANY EQUIPMENT NOT ACTIVELY IN USE SHALL BE SHUT DOWN IMMEDIATELY.
- CONSTRUCTION HOURS SHALL BE LIMITED TO 7:00AM TO 5:00PM MONDAY THROUGH FRIDAY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE OR DETERIORATION OCCURRING TO EXISTING PUBLIC IMPROVEMENTS AS A DIRECT RESULT OF CONSTRUCTION ACTIVITY RELATED TO CONSTRUCTION OF THE COMMON IMPROVEMENTS (GRADING, ROAD CONSTRUCTION, UTILITY INSTALLATION, ETC.). REQUIRED REPAIR MAY INVOLVE PATCHING, SEALING OR OVERLAYING AFFECTED AREAS AS APPROPRIATE TO RETURN THE ROADS AND/OR DRIVEWAYS TO AS GOOD A CONDITION AS THEY WERE IN PRIOR TO CONSTRUCTION. IF THE CONTRACTOR DOES NOT ACT PRUDENTLY IN A TIMELY MANNER, THE CITY MAY, AT ITS DISCRETION PERFORM THE CORRECTION AND CHARGE THE CONTRACTOR FOR ALL COSTS AND OVERHEAD INCURRED.
- ALL PIPING, VALVES, FITTINGS AND APPURTENANCES REMOVED IN THE COURSE OF WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS INTENDED FOR REUSE WHERE INDICATED ON PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, STORAGE, TRANSPORTATION AND DISPOSAL OF ALL SUCH MATERIALS.
- CONTRACTOR SHALL FOLLOW AND COMPLY WITH THE LATEST EDITION OF THE CITY'S STANDARDS, WHEREVER APPLICABLE.
- ACCESS GATE AT HARDIN LANE TO REMAIN OPEN DURING WORK HOURS. SAFETY REQUIRES THAT NO VEHICLES PARK, EVEN MOMENTARILY, ON HARDIN LANE IN FRONT OF THE GATE.

RECORD DRAWING REFERENCE			
NO.	DATE	DESCRIPTION	BY

PROJECT RESOURCE (FOR CITY USE)	
PROJECT START	
PROJECT END	
PROJECT CONTRACTOR	
CONTRACTOR'S SUPER.	
UTILITY CONT.	
UTILITY CONT.	
UTILITY CONT.	
PROJECT MANAGER	
PROJECT INSPECTOR	
OTHER	

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HARDIN LANE TANK REHABILITATION

PETALUMA, CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION

ON A FULL-SCALE DRAWING, LENGTH OF BAR BELOW IS 1-INCH. IF BAR MEASURES LESS THAN 1-INCH, THIS SHEET WAS PLOTTED AT A REDUCED SCALE, WHICH MAY REQUIRE ADJUSTMENT OF SCALE(S) SHOWN ON DRAWING.

PROJECT	DATE
4754.02	APRIL 2024
DRAWN BY	CHECKED BY
PIT	SMJ

ABBREVIATIONS LEGEND & NOTES













SHEET NO.

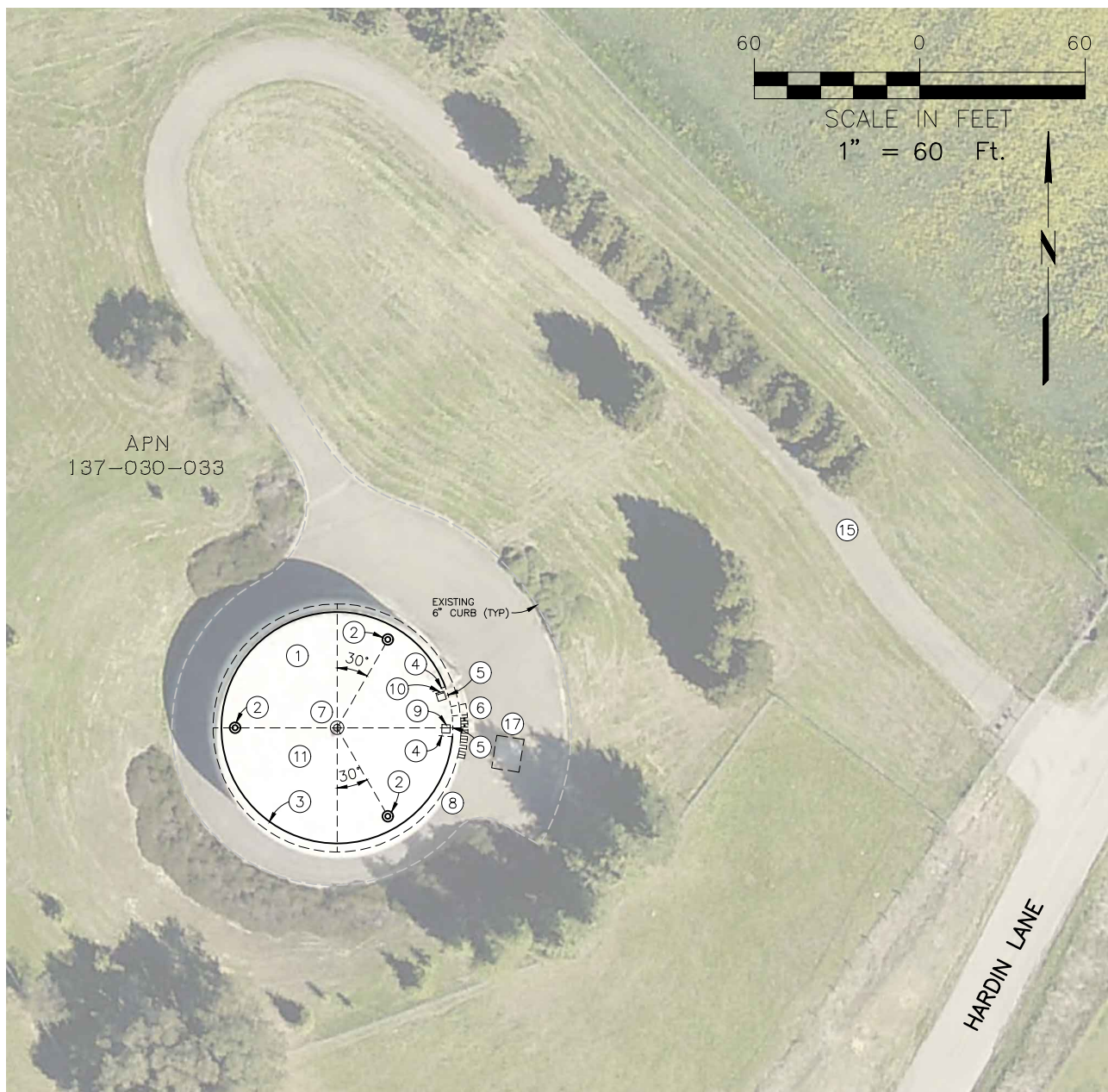
2 OF **12**

WELDED STEEL TANK PARAMETERS

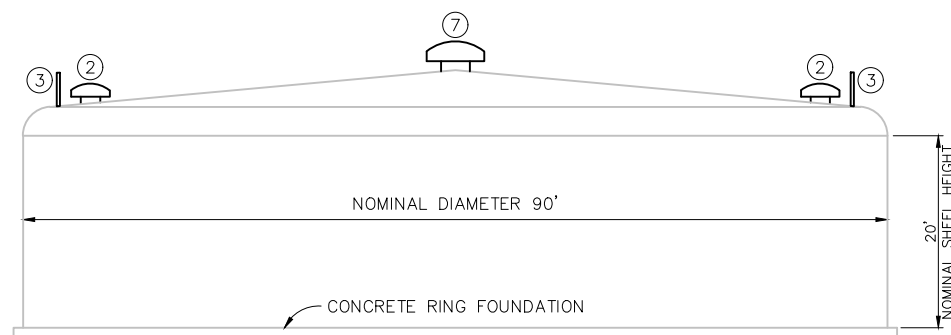
ERECTED:	1991
NOMINAL CAPACITY:	1 MILLION GALLONS
SHELL DIAMETER:	90'
SHELL HEIGHT:	20'
KNUCKLE RADIUS:	3'
FLOOR:	STEEL
SHELL MANWAYS:	2 EACH 30"
ROOF HATCHES:	2 EACH 30" x 30"

LEGEND

- ① REMOVE EXISTING COATINGS ON TANK INTERIOR AND EXTERIOR, PREPARE STEEL SURFACES AND RECOAT. SEE SPECIFICATIONS.
- ② INSTALL 24" PERIMETER ROOF VENTS. SEE DETAIL .
- ③ INSTALL GUARDRAIL (265 LF). 6" INSIDE TOP OF KNUCKLE. ATTACH TO EXISTING GUARDRAIL IN TWO PLACES. SEE DETAIL .
- ④ REMOVE AND REPLACE 4' RETURN OF EXISTING GUARDRAIL (2 EACH).
- ⑤ EXISTING GUARDRAIL TO REMAIN. PROTECT IN PLACE.
- ⑥ EXISTING EXTERIOR STAIRCASE, INTERMEDIATE LANDING AND ROOF PLATFORM TO REMAIN. PROTECT IN PLACE.
- ⑦ EXISTING CENTER ROOF VENT. REPLACE GALVANIZED EXPANDED STEEL AND STAINLESS-STEEL MESH SCREEN. SEE DETAIL .
- ⑧ REPLACE EXISTING FULL-HEIGHT LEVEL INDICATOR. SEE DETAIL .
- ⑨ REMOVE INTERIOR PLATFORM. SEE DETAIL .
- ⑩ REPLACE INTERIOR LADDER. 316 STAINLESS STEEL LADDER ELECTRICALLY ISOLATED FROM ALL CARBON STEEL.  .
- ⑪ REPLACE 20 EACH 6" DIAMETER ROOF HANDHOLE COVERS FOR CATHODIC PROTECTION SYSTEM. COVERS, LOCKBAR AND HARDWARE SHALL BE STAINLESS STEEL. REPLACE ALL GASKETS.
- ⑫ EXISTING ELECTRICAL CABINET. REFER TO ELECTRICAL DRAWINGS FOR IMPROVEMENT DETAILS.
- ⑬ EXISTING CATHODIC PROTECTION CABINET. REFER TO ELECTRICAL DRAWINGS FOR IMPROVEMENT DETAILS.
- ⑭ EXISTING OVERFLOW PIPE. ADD 10" DUCKBILL CHECK VALVE. SEE DETAIL .
- ⑮ PRIVATE DRIVEWAY FROM HARDIN LANE, TO REMAIN.
- ⑯ REVISE SENSING AND SAMPLING PIPING. SEE DETAIL .
- ⑰ INSTALL PIPE PENETRATION .
- ⑱ EXISTING VALVE VAULT INTERIOR MODIFICATIONS. SEE DETAILS  .
- ⑲ REPLACE GASKETS ON 2 EACH SHELL MANWAYS.



SITE PLAN



TANK ELEVATION

SCALE: 1" = 20'



HARDIN TANK

NORTHEAST VIEW

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HARDIN LANE TANK REHABILITATION

PETALUMA, CALIFORNIA

REVISIONS

NO.	DATE	DESCRIPTION

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PROJECT	DATE
4754.02	APRIL 2024
DRAWN BY	CHECKED BY
SYK	SMJ

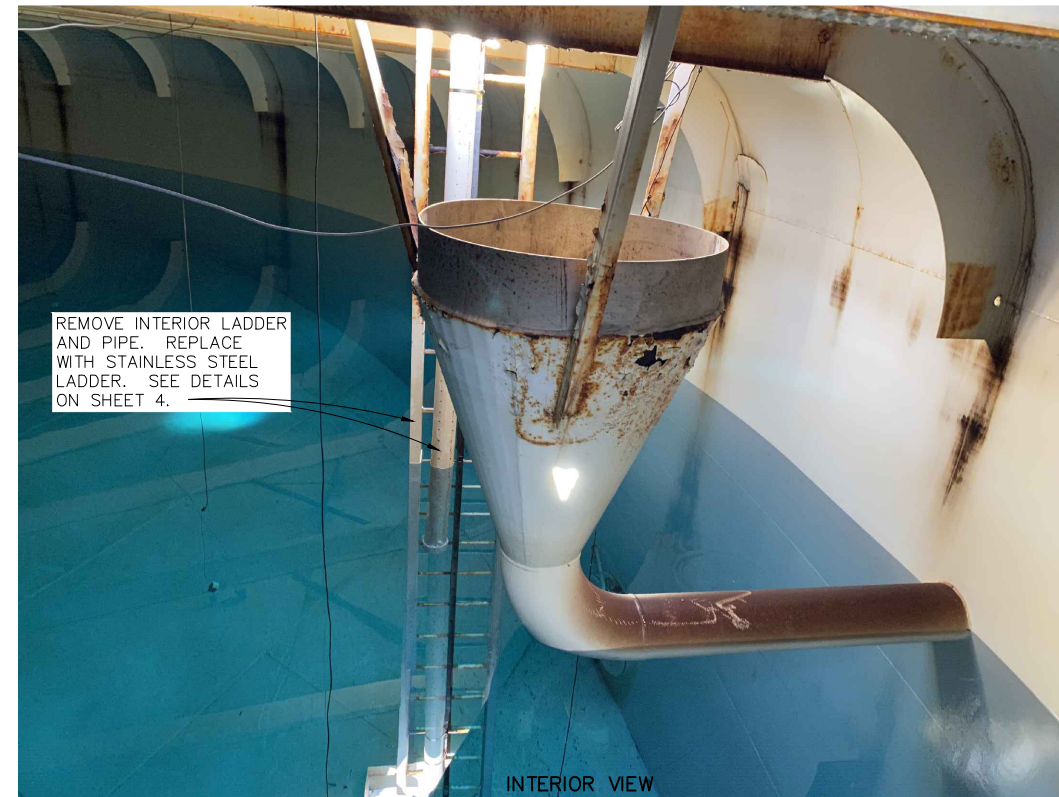
SITE PLAN

SHEET NO.

3 OF **12**



VIEW ABOVE HATCH



INTERIOR VIEW

INTERIOR LADDER
NOT TO SCALE



INTERIOR PLATFORM
NOT TO SCALE



CENTER VENT SCREEN
NOT TO SCALE



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**HARDIN LANE
TANK
REHABILITATION**

PETALUMA, CALIFORNIA

REVISIONS

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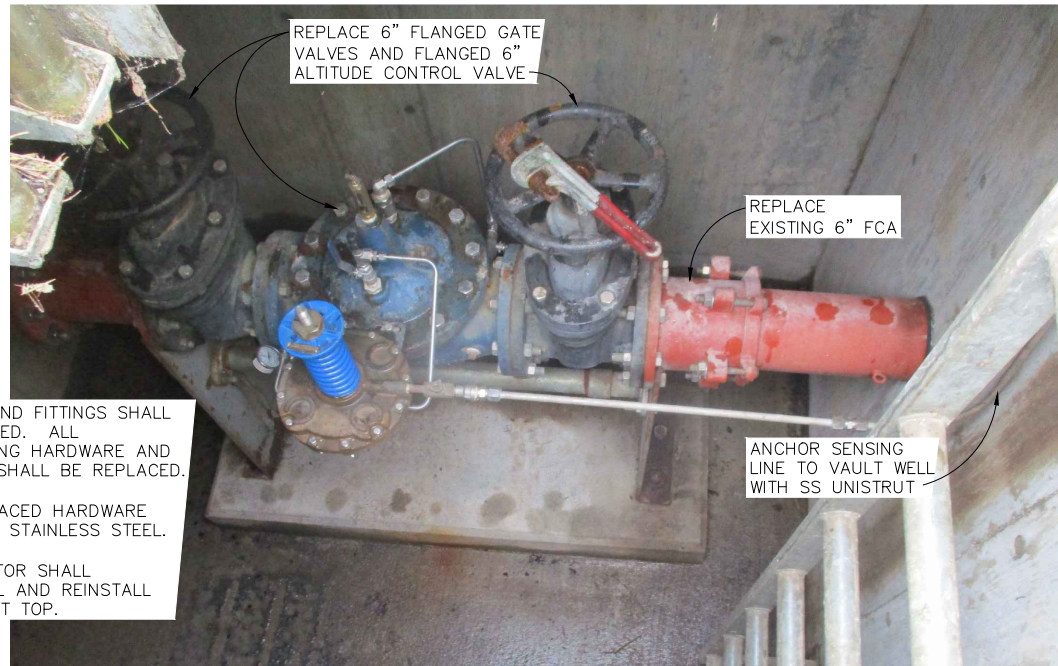
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PROJECT 4754.02	DATE APRIL 2024
DRAWN BY SYK	CHECKED BY SMJ

DETAILS

SHEET NO.

5 OF **12**



REPLACE 6" FLANGED GATE VALVES AND FLANGED 6" ALTITUDE CONTROL VALVE

REPLACE EXISTING 6" FCA

ANCHOR SENSING LINE TO VAULT WELL WITH SS UNISTRUT

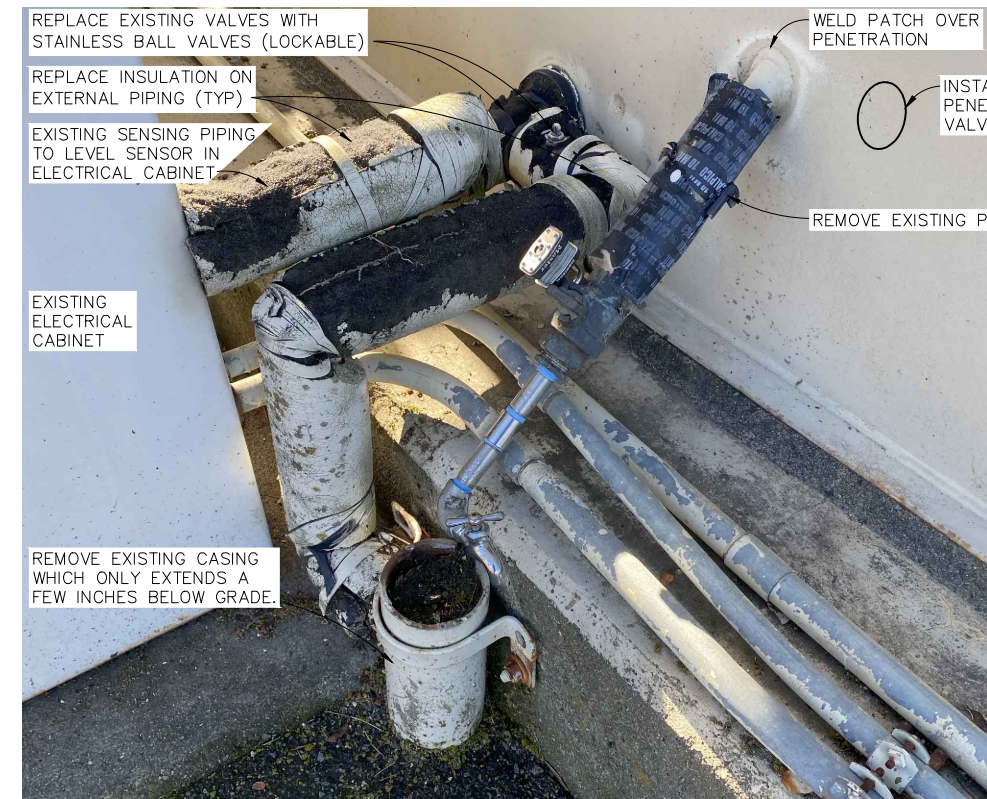
NOTE

- 1) VALVES AND FITTINGS SHALL BE FLANGED. ALL CONNECTING HARDWARE AND FITTINGS SHALL BE REPLACED.
- 2) ALL REPLACED HARDWARE SHALL BE STAINLESS STEEL.
- 3) CONTRACTOR SHALL UNINSTALL AND REINSTALL THE VAULT TOP.

VALVE VAULT – 6" ALTITUDE CONTROL VALVE

NOT TO SCALE

AC
3



REPLACE EXISTING VALVES WITH STAINLESS BALL VALVES (LOCKABLE)

REPLACE INSULATION ON EXTERNAL PIPING (TYP)

EXISTING SENSING PIPING TO LEVEL SENSOR IN ELECTRICAL CABINET

EXISTING ELECTRICAL CABINET

REMOVE EXISTING CASING WHICH ONLY EXTENDS A FEW INCHES BELOW GRADE.

WELD PATCH OVER PENETRATION

INSTALL NEW PIPING PENETRATION WITH BALL VALVE PER DETAIL

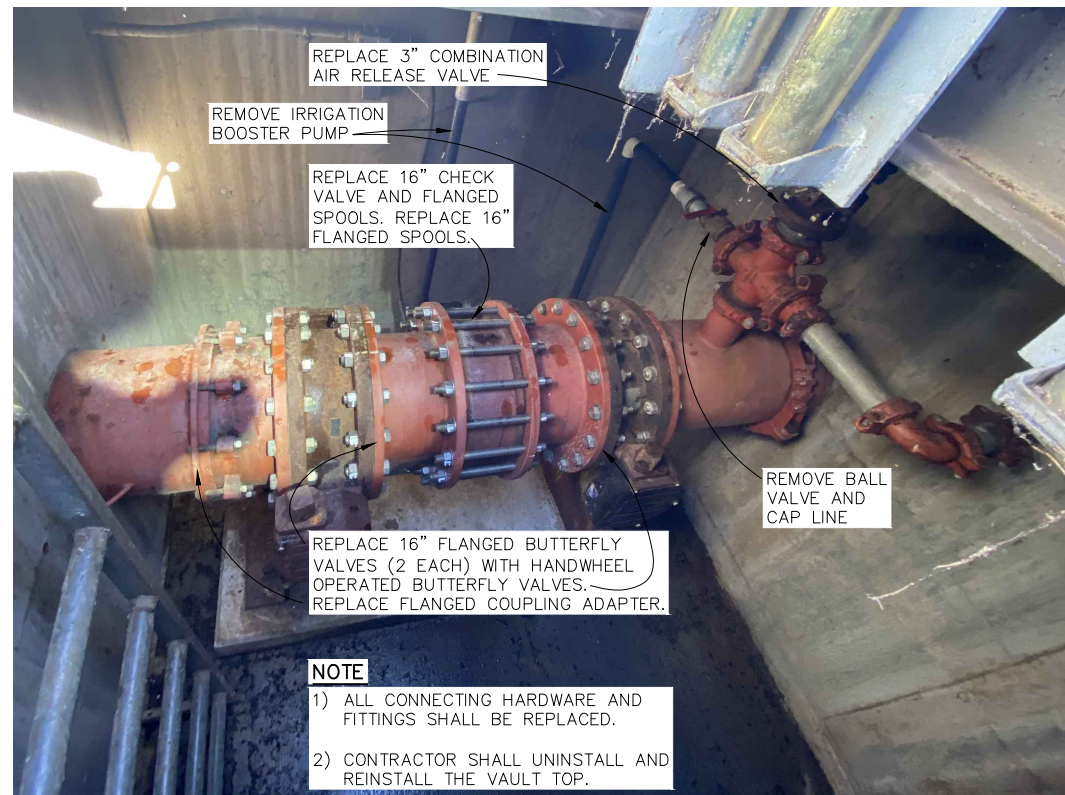
PP
7

REMOVE EXISTING PIPING

SMALL PIPING MODIFICATIONS AT TANK EXTERIOR

NOT TO SCALE

SP
3



REPLACE 3" COMBINATION AIR RELEASE VALVE

REMOVE IRRIGATION BOOSTER PUMP

REPLACE 16" CHECK VALVE AND FLANGED SPOOLS. REPLACE 16" FLANGED SPOOLS.

REMOVE BALL VALVE AND CAP LINE

REPLACE 16" FLANGED BUTTERFLY VALVES (2 EACH) WITH HANDWHEEL OPERATED BUTTERFLY VALVES. REPLACE FLANGED COUPLING ADAPTER.

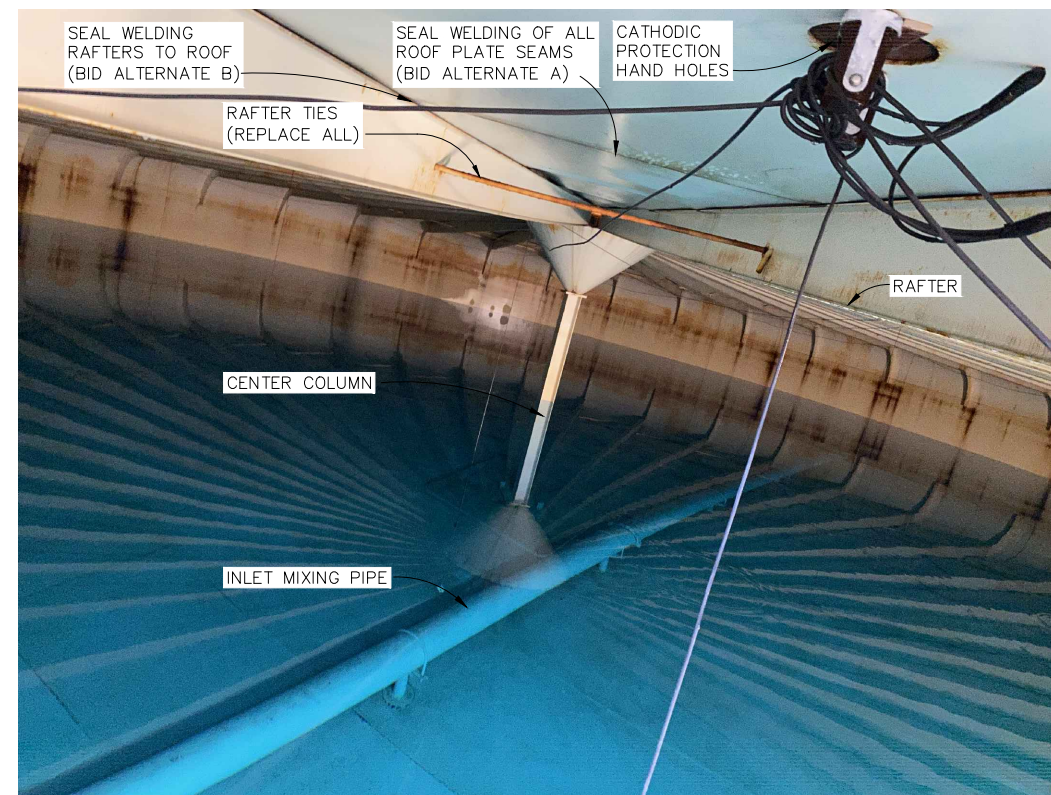
NOTE

- 1) ALL CONNECTING HARDWARE AND FITTINGS SHALL BE REPLACED.
- 2) CONTRACTOR SHALL UNINSTALL AND REINSTALL THE VAULT TOP.

VALVE VAULT – 16" CHECK VALVE

NOT TO SCALE

CV
3



SEAL WELDING RAFTERS TO ROOF (BID ALTERNATE B)

SEAL WELDING OF ALL ROOF PLATE SEAMS (BID ALTERNATE A)

CATHODIC PROTECTION HAND HOLES

RAFTER TIES (REPLACE ALL)

RAFTER

CENTER COLUMN

INLET MIXING PIPE

INTERIOR ROOF RAFTERS AND RAFTER TIES

NOT TO SCALE

RT
-

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HARDIN LANE TANK REHABILITATION

PETALUMA, CALIFORNIA

REVISIONS

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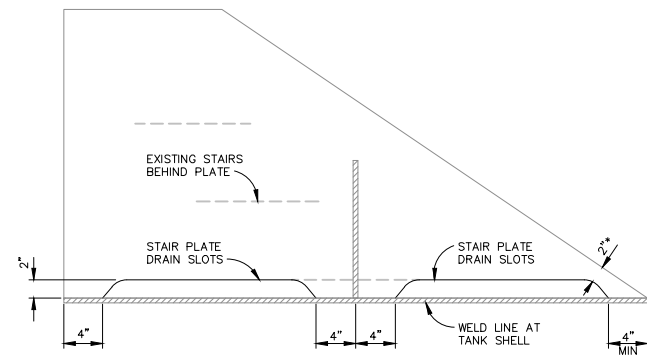
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DRAWN BY SYK	CHECKED BY SMJ

DETAILS

SHEET NO.

6 OF **12**



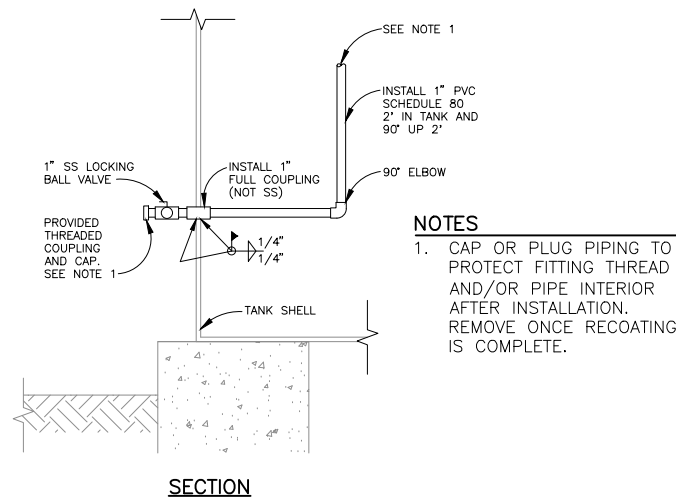
* ADJUST THE LENGTH OF SLOTS TO ENSURE 2" MINIMUM OF STEEL REMAINS ALL AROUND THE SLOTS.



STAIR PLATE DRAIN SLOTS

NOT TO SCALE

DS
3

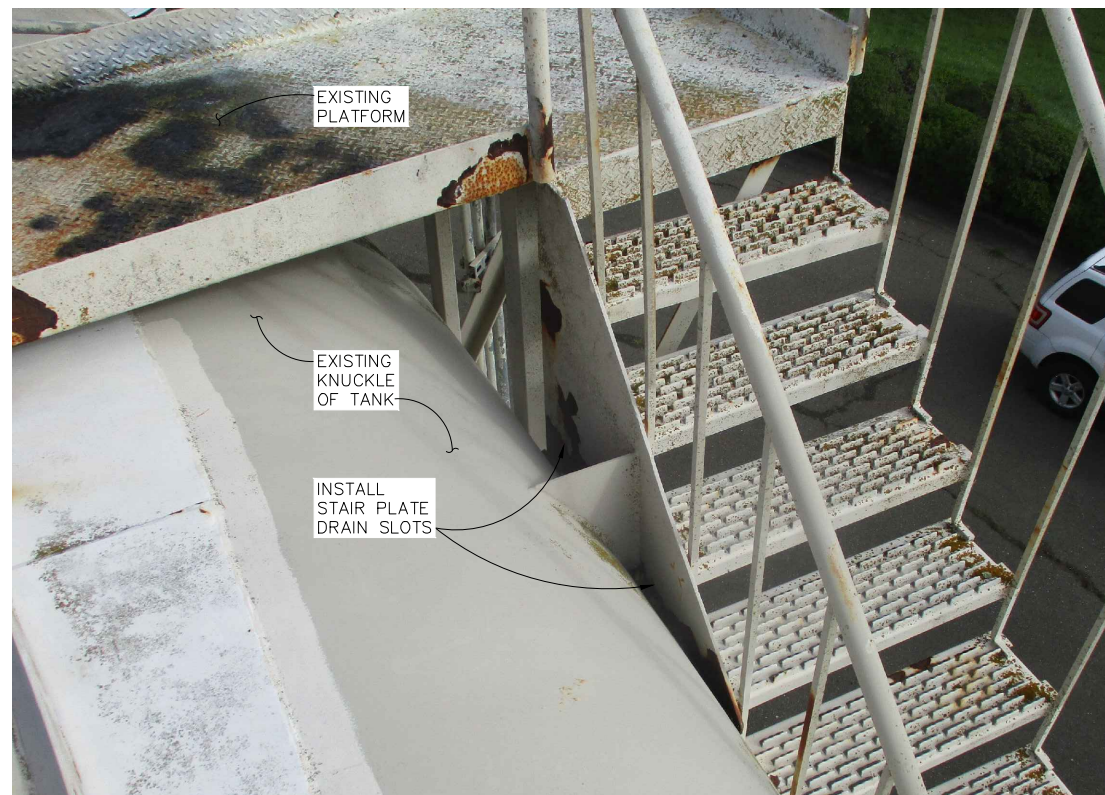


NOTES
1. CAP OR PLUG PIPING TO PROTECT FITTING THREAD AND/OR PIPE INTERIOR AFTER INSTALLATION. REMOVE ONCE RECOATING IS COMPLETE.

PIPE PENETRATION

NOT TO SCALE

PP
3



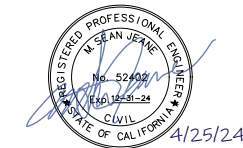
EXTERIOR STAIRCASE

NOT TO SCALE

ES
3

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DRAWN BY SYK	CHECKED BY SMJ

DETAILS

SHEET NO.

7 OF **12**

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MISCELLANEOUS ELECTRICAL & INSTRUMENTATION ABBREVIATIONS					
&	AND	HOR	HAND-OFF-REMOTE	PRESS	PRESSURE
@	AT	HP	HORSEPOWER	PRI	PRIMARY
A	AMBER, AMPERES	HPS	HIGH PRESSURE SODIUM	PROVIDE	FURNISH, INSTALL & CONNECT
AC	ALTERNATING CURRENT	HS	HAND SWITCH	PRR	POWER RELAY
AF	AMP FRAME	HTR	HEATER	PS	PRESSURE SWITCH, POWER SUPPLY
AFF	ABOVE FINISHED FLOOR	HZ	HERTZ (CYCLES PER SECOND)	PT	POTENTIAL TRANSFORMER
AI	ANALOG INPUT	HZD	HAZARDOUS AREA, EXPLOSION PROOF	PTT	PUSH TO TEST
AIC	AMP INTERRUPTING CAPACITY SYMMETRICAL	I	INTERLOCK	PV	PROCESS VARIABLE
AL	RIGID ALUMINUM CONDUIT	I/O	INPUT/OUTPUT	PVC	POLY VINYL CHLORIDE
ALT	ALTERNATOR	ICR	INSTRUMENTATION CONTROL RELAY	PWR	POWER
AM	AMMETER	INST	INSTANTANEOUS	R	RED
ARMS	ARC FLASH REDUCTION MAINTENANCE SYS	ISC	SHORT CKT INTERRUPTING CURRENT (SYMM)	RCT	REPEAT CYCLE TIMER
AO	ANALOG OUTPUT	ISR	INTRINSICALLY SAFE RELAY	REF	REFERENCE
AT	AMP TRIP	J	JUNCTION BOX	RIO	REMOTE I/O
ATS	AUTOMATIC TRANSFER SWITCH	K	KILO, PREFIX	RTD	RESISTANCE TEMPERATURE DETECTOR
AWG	AMERICAN WIRE GAUGE	KAIC	KILO-AMPERE INTERRUPTING CAPACITY	RTM	RUN TIME METER
B	BLUE	L	LINE	RTU	REMOTE TELEMETRY UNIT
BC	BARE COPPER	LA	LIGHTNING ARRESTOR	RVNR	REDUCED VOLTAGE NON-REVERSING
BFC	BELOW FINISHED CEILING	LC	LIGHTING CONTACTOR	(R)	REWIRE, RELOCATE, REVISE, REUSE, REPLACE
BOD	BIOCHEMICAL OXYGEN DEMAND	LCD	LIQUID CRYSTAL DISPLAY	SC	SHORTING CONTACTOR
BLK	BLANK	LED	LIGHT EMITTING DIODE	SCH	SCHEDULE
BKR	BREAKER	LEL	LOWER EXPLOSIVE LIMIT	SEC	SECONDARY
C	CONDUIT	LGT	LIGHT	SECS	SECONDS
CAP	CAPACITOR	LO	LOW	SEL	SELECTOR
CB	CIRCUIT BREAKER	LOR	LOCAL-OFF-REMOTE	SFA	SERVICE FACTOR AMPS
CBL	CABLE	LOS	LOCK-OUT STOP SWITCH	SP	SETPOINT
CH	CHANNEL	LP	LIGHTING PANELBOARD	SPD	SURGE PROTECTIVE DEVICE
CKT	CIRCUIT	LPU	LINE PROTECTION UNIT	SPEC	SPECIFICATION
COAX	COAXIAL CABLE	LS	LEVEL SWITCH	SS	STAINLESS STEEL
COMM	COMMUNICATION PORT	LSI	LONG, SHORT, INSTANTANOUS	SSS	SOLID STATE SOFT STARTER
CP	CONTROL PANEL	M	MOTOR CONTRACTOR	STT	START
CPT	CONTROL POWER TRANSFORMER	MAX	MAXIMUM	STP	STOP
CR	CONTROL RELAY	MCC	MOTOR CONTROL CENTER	SV	SOLENOID VALVE
CT	CURRENT TRANSFORMER	MCM	THOUSAND CIRCULAR MILS	SW	SWITCH
CTQ	CONSTANT TORQUE	MCP	MOTOR CIRCUIT PROTECTOR	SWBD	SWITCHBOARD
CU	COPPER, CONDENSING UNIT	MH	MANHOLE	SWGR	SWITCHGEAR
DC	DIRECT CURRENT	MHD	METAL HALIDE	SYMM	SYMMETRICAL
DET	DETAIL	MIN	MINIMUM	T	TRIP
DI	DIGITAL INPUT	MINS	MINUTES	TB	TERMINAL BLOCK
DIA	DIAGRAM	MISC	MISCELLANEOUS	TC	TIME CLOCK
DISC	DISCONNECT	MNFR	MANUFACTURER	TDOD	TIME DELAY ON DE-ENERGIZATION
DIV	DIVISION	MOV	MOTOR OPERATED VALVE	TDOE	TIME DELAY ON ENERGIZATION
DO	DIGITAL OUTPUT	MPS	MOTOR PROTECTION SYSTEM	TEL	TELEMETRY
DPDT	DOUBLE POLE DOUBLE THROW	MS	MOISTURE SENSOR/SWITCH	TELCO	TELEPHONE COMPANY
DWG	DRAWING	MTR	MOTOR	TEMP	TEMPERATURE
ELEV	ELEVATION	MTS	MANUAL TRANSFER SWITCH	TM	THERMAL MAGNETIC
EMT	ELECTRICAL METALLIC TUBING	MV	MEDIUM VOLTAGE	TOC	TOTAL ORGANIC CARBON
ETM	ELAPSED TIME METER	N	NEUTRAL	TR	TIME DELAY RELAY
(E)	EXISTING	NC	NORMALLY CLOSED	TRIAD	TWISTED & SHIELDED 3 CONDUCTOR
F	FRAME	NEC	NATIONAL ELECTRICAL CODE	TS	TEMPERATURE SWITCH
FC	FAIL CLOSED, FAN COIL	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION	TSPR	TWISTED & SHIELDED PAIR
FCS	FIELD CONTROL STATION	NIC	NOT IN CONTRACT	TYP	TYPICAL
FLA	FULL LOAD AMPS	NO	NORMALLY OPEN	UG	UNDERGROUND
FO	FAIL OPEN	NP	NAMEPLATE	UL	UNDERWRITERS LABORATORIES
FLEX	FLEXIBLE, METAL LIQUID TIGHT CONDUIT	NTS	NOT TO SCALE	UON	UNLESS OTHERWISE NOTED
FROA	FORWARD-REVERSE-OFF-AUTO	(N)	NEW	UPS	UNINTERRUPTIBLE POWER SUPPLIES
FS	FLOW SWITCH OR FULL SPEED	OC	ON CENTER	V	VOLTAGE
FV, FVNR	FULL VOLTAGE NON-REVERSING	OI	OPERATOR INTERFACE	VA	VOLT AMPS
FVR	FULL VOLTAGE REVERSING	OL	OVERLOAD	VAR	VOLT AMP REACTIVE
FWD	FORWARD	ORP	OXIDATION REDUCTION POTENTIAL	VFD	VARIABLE FREQUENCY DRIVE
(F)	FUTURE	P	PHASE, POLE	VLV	VALVE
G	GREEN	PB	PULL BOX	VM	VOLTMETER
GALV	GALVANIZED	PBI	PULL BOX INSTRUMENT	VTQ	VARIABLE TORQUE
GEN	GENERATOR	PBP	PULL BOX POWER	W	WHITE, WATTS
GFI	GROUND FAULT CIRCUIT INTERRUPTER	PE	PHOTOCELL	WHM	WATT-HOUR METER
GND	GROUND	PF	POWER FAIL	WM	WATTMETER
GRS	GALVANIZED RIGID STEEL CONDUIT	PRF	POWER (PHASE) FAIL RELAY	WP	WATERPROOF, WEATHER PROOF
GRS-PVC	PVC COATED GRS CONDUIT	PH	HYDROGEN ION CONCENTRATION	WS	TORQUE SWITCH, WATER SURFACE
HC	PUSHBUTTON	PLC	PROGRAMMABLE LOGIC CONTROLLER	XFMR	TRANSFORMER
HI	HIGH	PM	POWER MONITOR	XS	MISCELLANEOUS SWITCH
HID	HIGH INTENSITY DISCHARGE	PMP	PUMP	Y	YELLOW
HMI	HUMAN MACHINE INTERFACE	PNL	PANEL	Z	IMPEDANCE
HOA	HAND-OFF-AUTO	PR	PAIR, TWISTED & SHIELDED CABLE	ZS	LIMIT SWITCH

SYMBOL	DESCRIPTION
SWITCHES – PROCESS	
	FLOW SWITCH – CLOSING UPON INCREASING FLOW
	FLOW SWITCH – OPENS UPON INCREASING FLOW
	LEVEL SWITCH – CLOSING UPON INCREASING LEVEL
	LEVEL SWITCH – OPENS UPON INCREASING LEVEL
	PRESSURE SWITCH – CLOSING UPON INCREASING PRESSURE (INCREASING VACUUM)
	PRESSURE SWITCH – OPENS UPON INCREASING PRESSURE (INCREASING VACUUM)
	TEMPERATURE SWITCH – CLOSING UPON INCREASING TEMPERATURE
	TEMPERATURE SWITCH – OPENS UPON INCREASING TEMPERATURE
	LIMIT SWITCH – CLOSING AT SET LIMIT
	LIMIT SWITCH – OPENS AT SET LIMIT
	PROXIMITY SWITCH – CLOSING UPON DECREASING DISTANCE
	PROXIMITY SWITCH – OPENS UPON DECREASING DISTANCE
	TORQUE SWITCH – CLOSING UPON INCREASING TORQUE
	TORQUE SWITCH – OPENS UPON INCREASING TORQUE

SYMBOL	DESCRIPTION
SWITCHES – OPERATOR	
	TOGGLE OR DISCONNECT SWITCH
	PUSHBUTTON – NORMALLY OPEN, MOMENTARY ACTION
	PUSHBUTTON – NORMALLY CLOSED, MOMENTARY ACTION
	PUSHBUTTON, MECHANICALLY INTERLOCKED, DOUBLE CIRCUIT – NORMALLY CLOSED AND NORMALLY OPEN, MAINTAINED ACTION
	SELECTOR SWITCH, 3 POSITION – CONTACT STATUS SHOWN EXISTS AT POSITION OF H–HAND, O–OFF, OR A–AUTO
	SELECTOR SWITCH, 2 POSITION – CONTACT STATUS SHOWN EXISTS AT POSITION AS SHOWN

SYMBOL	DESCRIPTION
DEVICES – RELAY	
	CONTROL RELAY CR1 WITH NORMALLY OPEN CONTACT ON LINE 28 & NORMALLY CLOSED CONTACT ON LINE 111
	TIME DELAY RELAY TR2 – ADJUSTABLE TIME DELAY RANGE & SETTING AS SHOWN
	TIME DELAY ON ENERGIZATION
	TIME DELAY ON DE-ENERGIZATION
	CONTACTOR OR STARTER M1
	SOLENOID
	NORMALLY OPEN, RELAY CONTACT – ACTUATED BY RELAY CR1 COIL LOCATED ON LINE 105
	NORMALLY CLOSED, RELAY CONTACT – ACTUATED BY RELAY CR1
	NORMALLY OPEN, TIME DELAY RELAY CONTACT – CONTACT CLOSING AFTER TR2 IS ENERGIZED
	NORMALLY CLOSED, TIME DELAY RELAY CONTACT – CONTACT CLOSING AFTER TR2 IS DE-ENERGIZED
	NORMALLY OPEN, TIME DELAY RELAY CONTACT – CONTACT CLOSING AFTER TR2 IS DE-ENERGIZED
	NORMALLY CLOSED, TIME DELAY RELAY CONTACT – CONTACT CLOSING AFTER TR2 IS DE-ENERGIZED
	CONTACT OPENS AND CLOSING IN A TIMED REPEAT CYCLE

SYMBOL	DESCRIPTION
DEVICES – FRONT PANEL	
	INDICATING LIGHT, LETTER "X" INDICATES COLOR: R=RED, G=GREEN, A=AMBER, W=WHITE, Y=YELLOW, B=BLUE
	INDICATING LIGHT, PUSH TO TEST
	AMP METER
	VOLT METER
	ELAPSED TIME METER
	RUN TIME METER
	MULTI-POSITION SWITCH WHERE LETTER "X" IS FUNCTION: A=AMP, V=VOLT

SYMBOL	DESCRIPTION
COMPONENTS	
	RESISTOR
	POTENTIOMETER
	CAPACITOR, FIXED
	CAPACITOR, ADJUSTABLE
	DIODE
	DIODE, ZENER
	VARIABLE TRANSIENT VOLTAGE SUPPRESSOR
	VOLTAGE SURGE SUPPRESSOR, AC
	RESISTANCE TEMPERATURE DETECTOR (RTD)
	THERMOCOUPLE (T/C)
DEVICES – MISCELLANEOUS	
	AUDIBLE ALARM
	BATTERY
	HEATER
	3 PHASE HEATER
	GENERATOR
	3 PHASE MOTOR # = MOTOR HP
	SINGLE PHASE MOTOR
	TRANSFORMER
	LINE REACTOR

SYMBOL	DESCRIPTION
DEVICES – PROTECTIVE	
	DISCONNECT, 3 POLE
	CIRCUIT BREAKER, 3 POLE THERMAL MAGNETIC (TM) OR MOTOR CIRCUIT PROTECT (MCP)
	THERMAL OVERLOAD CONTACT
	THERMAL OVERLOAD ELEMENT
	FUSE WITH BLOWN FUSE INDICATING LIGHT
	FUSE
	MEDIUM VOLTAGE DRAWOUT BREAKER
	LOW VOLTAGE DRAWOUT CIRCUIT BREAKER

SYMBOL	DESCRIPTION
	PANEL OR EQUIPMENT WIRING
	FIELD WIRING
	CONDUCTORS – NOT CONNECTED
	CONDUCTORS – CONNECTED
	GROUND
	CHASSIS OR FRAME GROUND
	PLUG AND RECEPTACLE
	INCOMING LINE
	TERMINAL BLOCKS
	TERMINALS
	SHIELDED CABLE

PLAN – SYMBOLS	
	CONDUIT, EXPOSED
	CONDUIT, IN SLAB OR BELOW GRADE
	CONDUIT STUBBED OUT & CAPPED
	CONDUIT BENDS TOWARD OBSERVER
	CONDUIT BENDS AWAY FROM OBSERVER
	CONDUIT ENDS
	CONDUIT CHANGE IN ELEVATION
	BARE COPPER GROUND WIRE
	GROUND CONNECTION BOLTED TYPE
	GROUND CONNECTION EXOTHERMIC WELD TYPE
	PULL BOX
	DISCONNECT SWITCH
	FIELD CONTROL STATION WITH JUNCTION BOX
	FIELD CONTROL STATION WITH #AMP DISCONNECT SWITCH
	SPECIAL RECEPTACLE
	JUNCTION BOX
	THERMOSTAT
	LIGHTING, FANS, HEATERS
	# – CIRCUIT BREAKER NUMBER
	A – FIXTURE SCHEDULE REF.
	o – CONTROL SWITCH REFERENCE
	DUPLEX RECEPTACLE
	# – CIRCUIT BREAKER NUMBER
	# – CIRCUIT BREAKER NUMBER SUBSCRIPT – CIRCUIT CONTROLLED
	SUPERSCRIPT – BLANK = 1 POLE
	2 = 2 POLE
	3 = 3 WAY
	CONDUIT #
	EQUIPMENT NUMBER

Brelje & Race
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475 Aviation Boulevard, Suite 120
Santa Rosa, CA 95403
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f: 707-576-0469
www.brce.com



**HARDIN LANE
TANK
REHABILITATION**

PETALUMA, CALIFORNIA

REVISIONS		
NO.	DATE	DESCRIPTION

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PROJECT 4754.02	DATE MARCH 2024
DRAWN BY ZKV	CHECKED BY SMK

**ELECTRICAL
SYMBOLS &
ABBREVIATIONS, E1**

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NAMEPLATE SCHEDULE			
KEY	DEVICE	ENGRAVING	LETTER SIZE
11	BREAKER	RTU RECEIPT	1/2"
12	BREAKER	GFI RECEIPT	1/2"
13	BREAKER	CABINET HEATER & LIGHT	1/2"
14	BREAKER	VAULT LIGHTING & RECEIPT	1/2"
15	BREAKER	TANK LIGHTING	1/2"
16	BREAKER	CATHODIC PROTECTION	1/2"
17	BREAKER	SPARE	1/2"

POWER UTILITY SERVICE DIVISION OF WORK	Electrical Contractor	Utility Company
Primary Conduits	N/A	
Primary Conductors		N/A
Transformer Pad	N/A	
Transformer		N/A
Transformer Connections		N/A
Transformer Ground Rod	N/A	
Secondary Conduits	X	
Secondary Conductors		X
Bollards	N/A	
Meter Enclosure/Base	X	
Utility Meter		X
C/T Enclosure	X	
Current Transformers C/T		X
Meter Room Lock Box	X	

LOAD CALCULATIONS			
UTILITY SERVICE			
DESCRIPTION	LOAD AMP	QTY	LOAD VA
LIGHTS: PEDESTAL LIGHT	0.27	2	65
MISCELLANEOUS LOADS: CONTROLS	4.00	1	480
HEATER	1.80	1	216
RECEPTACLE	1.50	3	540
SUBTOTAL			1,441
LIGHTS @ 25% ADDITIONAL:			
TOTAL			1,441
120 / 240 V, 1 PHASE 3 WIRE SERVICE AMPS =		6.0 AMPS 1.25 MULTIPLIER 8 AMPS	
SERVICE SIZE			

Power Company Information:

Contact Name: _____

Power Utility: Pacific Gas & Electric

Address: _____

City/State/Zip: _____

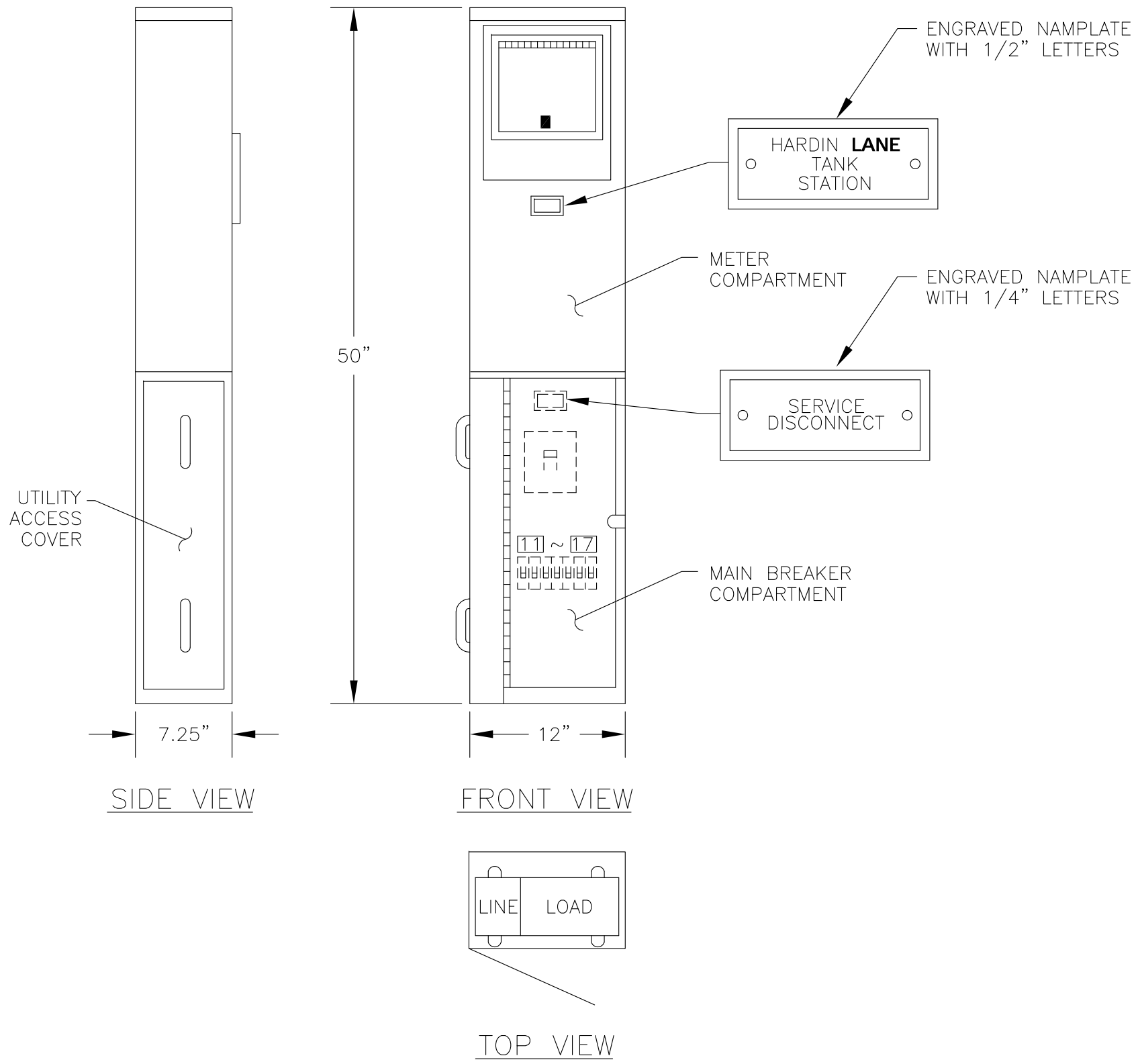
Phone: _____

Fax: _____

E-mail: _____

Notes:

- All Utility Service installation work shall be done by Contractor per Power Utility Engineered drawings (which supersedes what is shown on Contract Drawings).
- Contractor shall coordinate and schedule all Power Utility inspections and tests in strict compliance with Power Utility requirements.

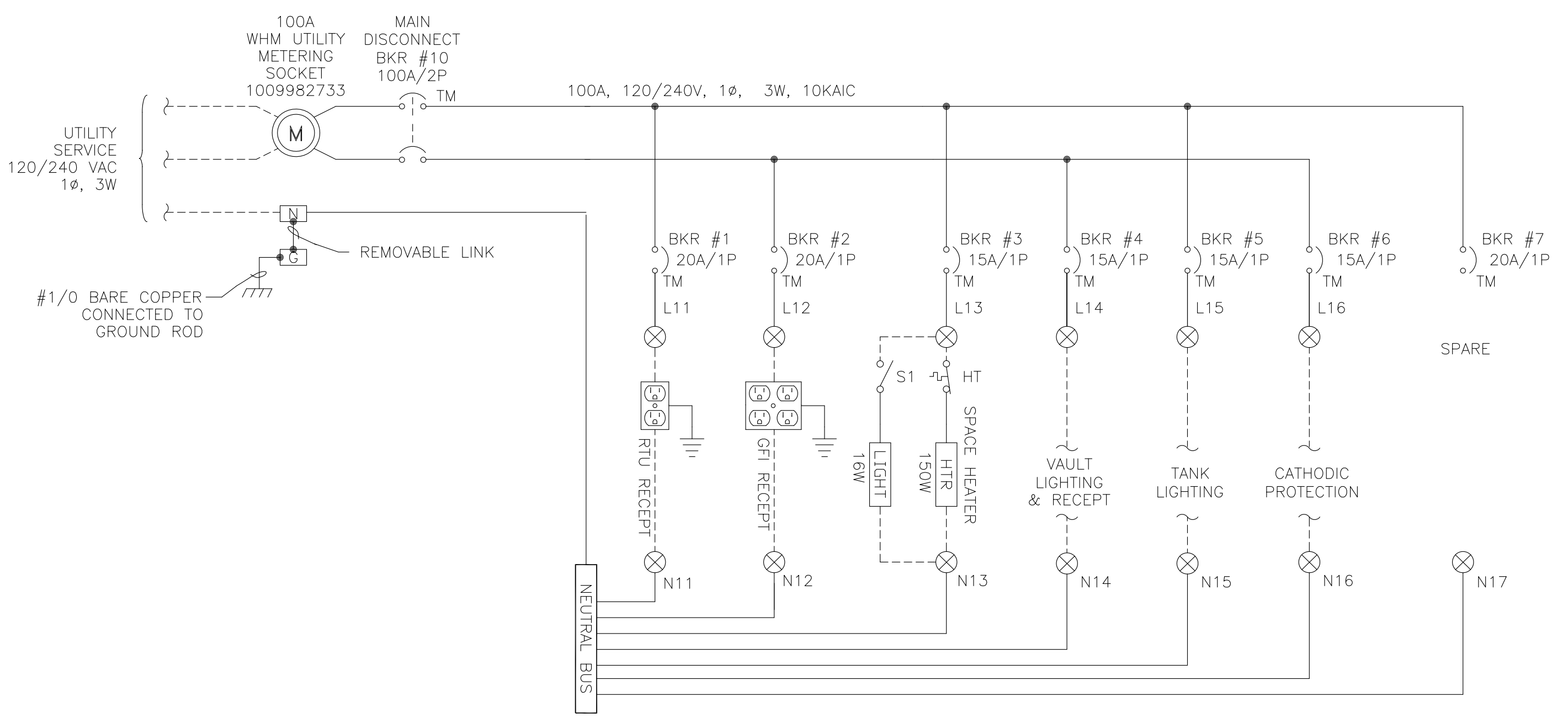


METER PEDESTAL ELEVATION
NOT TO SCALE

NOTES: ① ITEMS DRAWN IN DASHED LINES ARE TO BE LOCATED BEHIND DEADFRONT DOORS
OUTER DOORS ARE NOT SHOWN FOR ELEVATION CLARITY

FABRICATION METHODS

- NEMA 3R WEATHER-PROOFED FOR OUTSIDE INSTALLATION.
- ALL OUTER DOORS SEALED WITH PERMANENT TYPE GASKETING.
- EXTERIOR FABRICATED FROM HOT DIPPED GALVANIZED SHEET STEEL.
- 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
- ALL SEAMS CONTINUOUS WELDED.
- OUTER DOORS TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCHES.
- DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
- NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
- INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE STAINLESS STEEL.
- METERING SHALL BE U.L. LABELED AND APPROVED IN WRITING BY POWER UTILITY.
- EXTERIOR PANEL COLOR: WARM SUN (NEMEC COLOR CARD).
- INTERIOR DEADFRONT DOOR COLOR: WHITE.
- PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL DEVICES ON DEADFRONT.
- FABRICATION AND WIRING SHALL CONFORM TO U.L. 508 AND NEMA STANDARDS.
- ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
- WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
- AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH EQUIPMENT.



METERED PEDESTAL ONE LINE DIAGRAM

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TANK
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**METER PEDESTAL &
ONE LINE
DIAGRAM, E2**

SHEET NO.
9 OF **12**

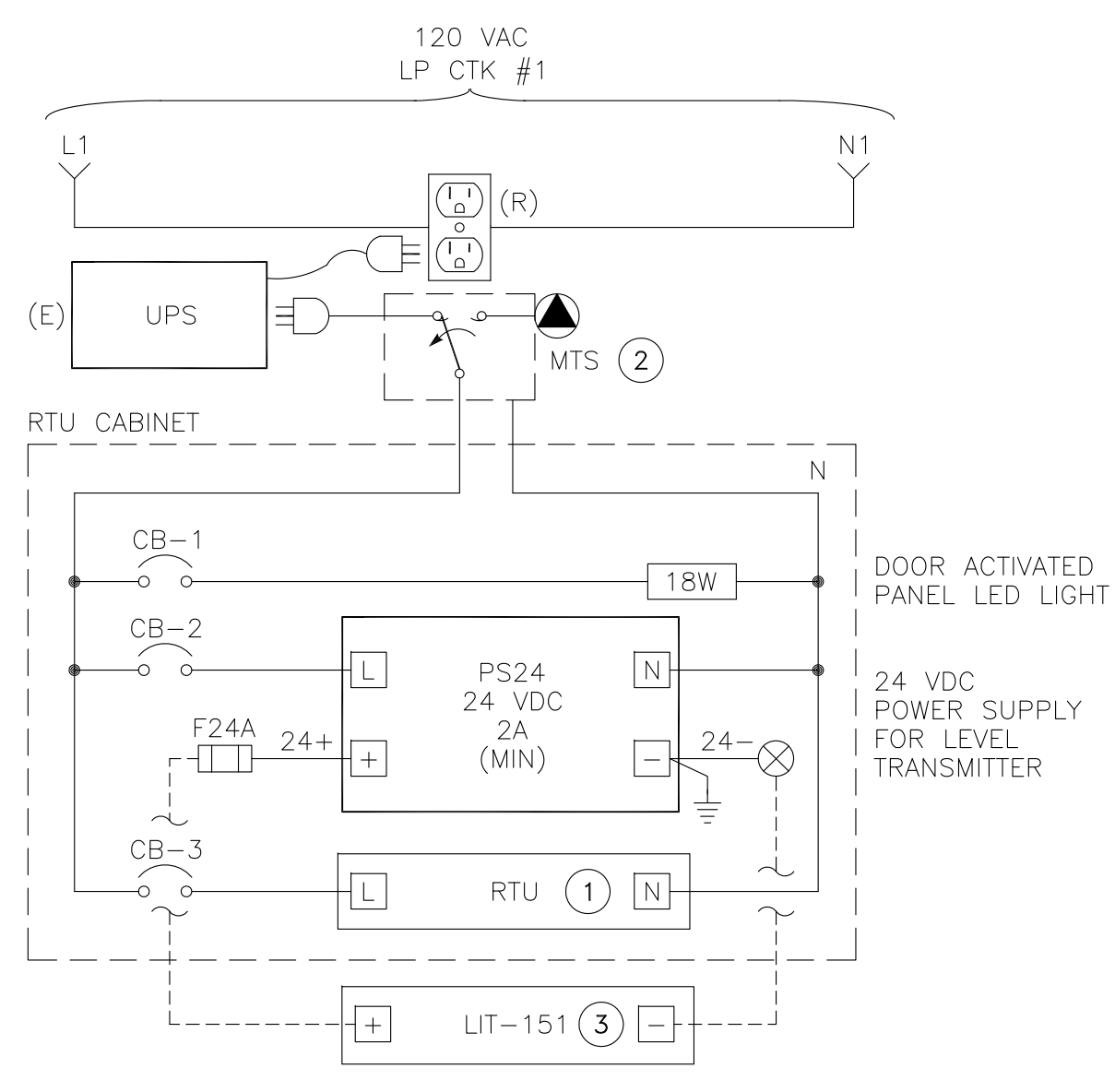
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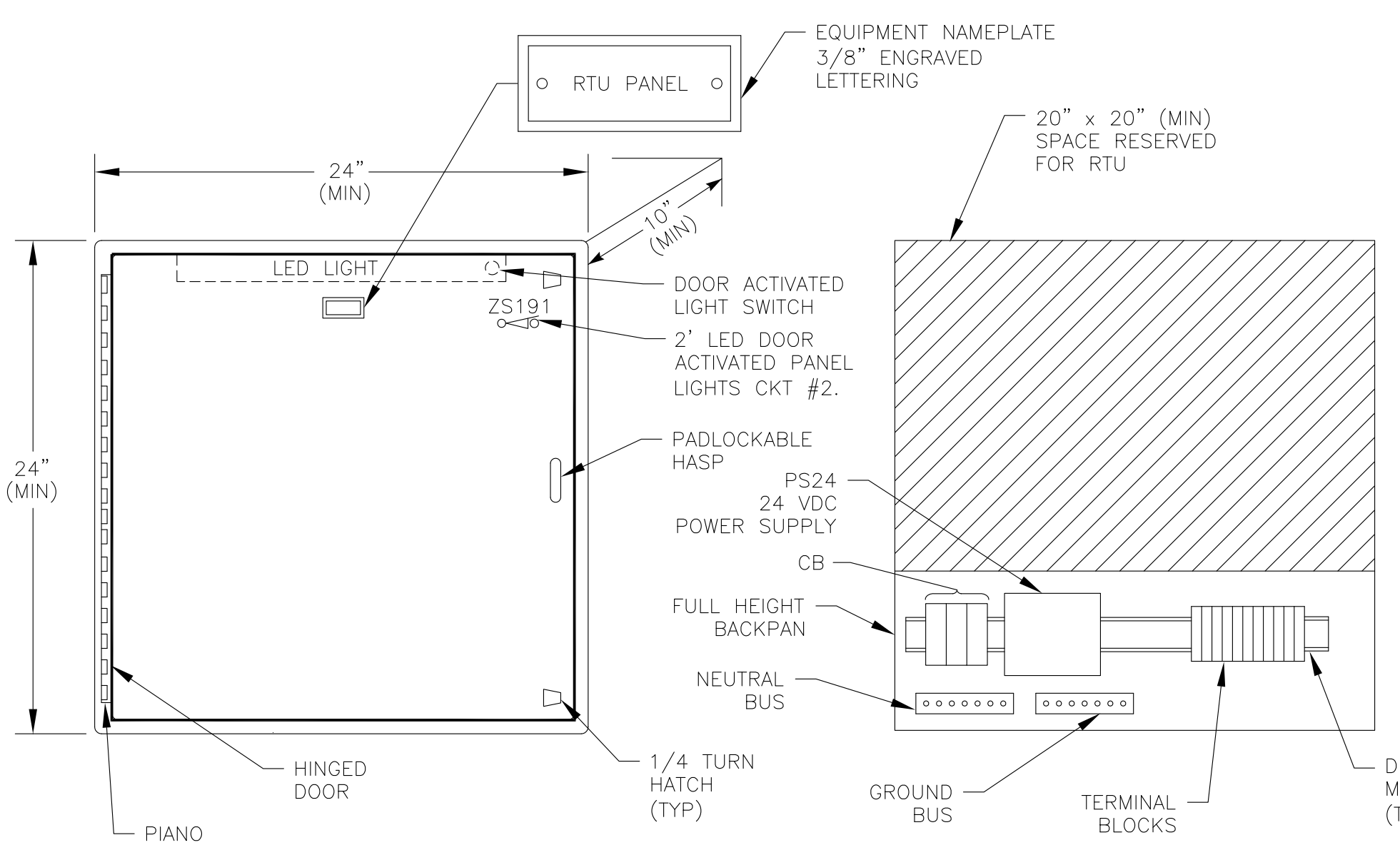
(E) ELECTRICAL CABINET (A) (E3) (1)

- NOTES:
- 1 REMOVE ALL EQUIPMENT & CABINET.
 - 2 REPLACE (E) LEVEL/PRESSURE INDICATING TRANSMITTER (LIT151). TO BE LOCATED OUTSIDE OF CABINET.
 - 3 TURN OVER TO OWNER.
 - 4 REPLACE (E) METER CABINET WITH NEW NEMA 3R UTILITY METER/MAIN PEDESTAL. NEW ELECTRICAL CABINET TO BE INSTALLED 2 FEET TO THE LEFT TO ALLOW UTILITY METER/MAIN TO BE INSTALLED CLEAR OF THE ELECTRICAL CABINET.



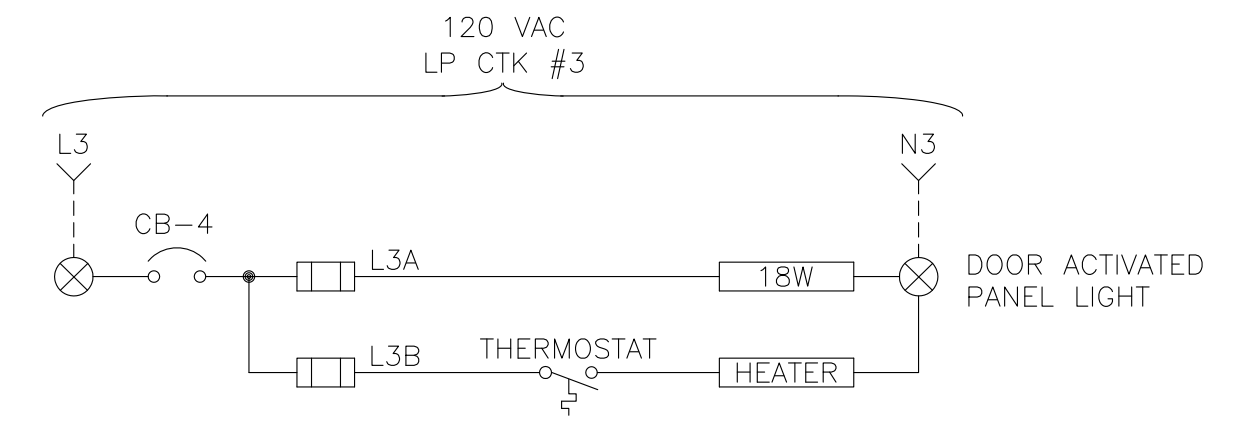
120 VAC POWER DISTRIBUTION (B) (E3)

- NOTES:
- 1 PROVIDED AND INSTALLED BY OTHERS.
 - 2 MANUAL TRANSFER SWITCH MTS WITH BUILT-IN RECEPTACLE. PROVIDE 10' CABLE FROM MTS TO (F) PORTABLE GENERATOR.
 - 3 LOCATE WITHIN ELECTRICAL CABINET.

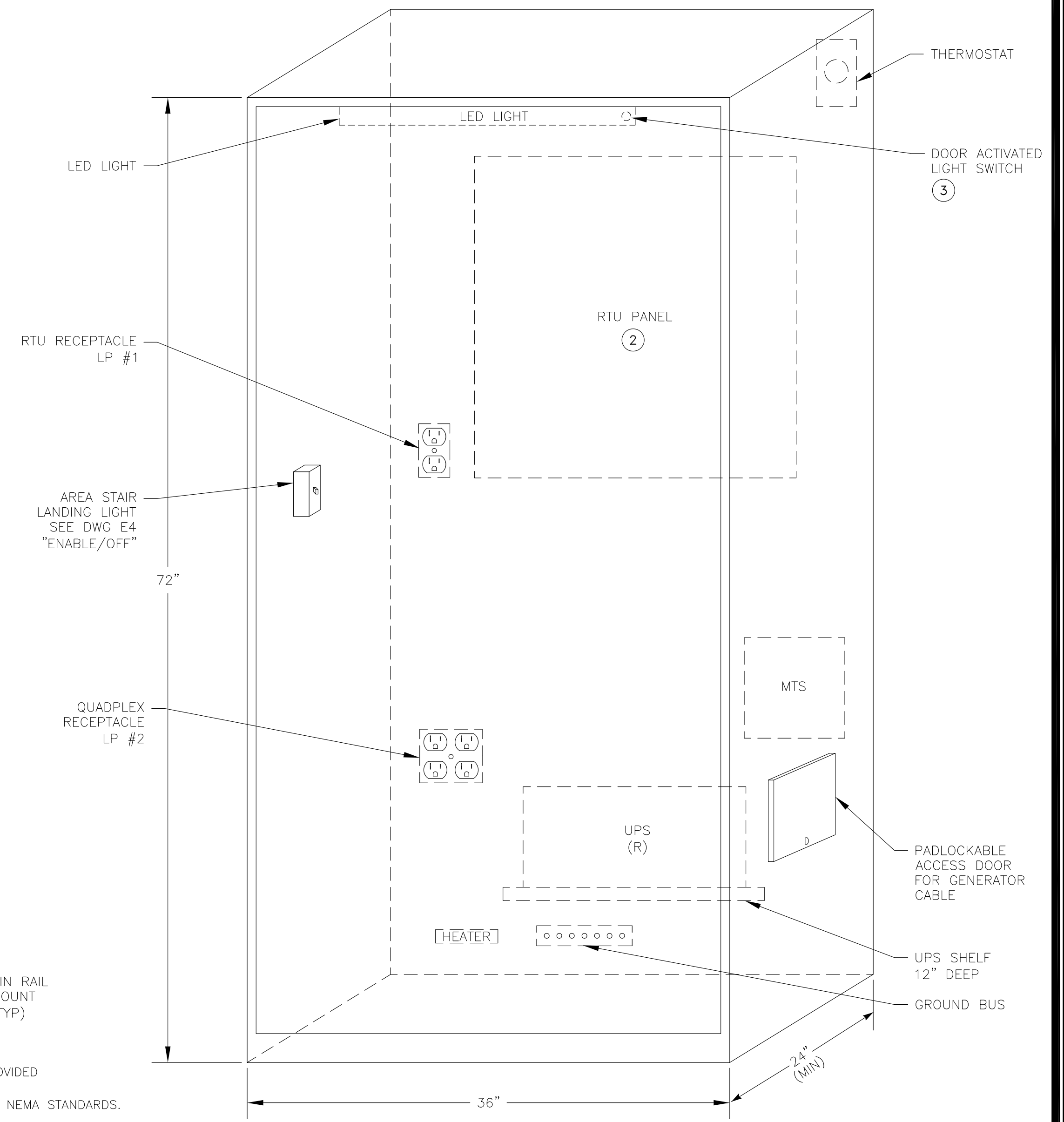


RTU PANEL ELEVATION DETAIL (C) (E3)

1. NEMA 12 FOR INSIDE INSTALLATION.
2. ALL OUTER DOORS SEALED WITH PERMANENT TYPE GASKETING.
3. EXTERIOR FABRICATED FROM HOT DIPPED GALVANIZED SHEET STEEL.
4. 12 GAUGE CONSTRUCTION.
5. ALL SEAMS CONTINUOUS WELDED.
6. OUTER DOOR TO BE PADLOCKABLE.
7. DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE STAINLESS STEEL.
10. EXTERIOR FULL HEIGHT PANEL COLOR: LIGHT GREY.
11. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL DEVICES ON DEADFRONT.
12. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
13. ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
14. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
15. AS - BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.
16. NEW INTRUSION SWITCHES. TERMINATE SIGNALS TO RTU TERMINAL BLOCKS.



ELECTRICAL CABINET UTILITY ELEMENTARY DIAGRAM (D) (E3)



(N) ELECTRICAL CABINET (E) (E3) (1)

- NOTES:
- 1 STAINLESS STEEL NEMA 4X 72"H x 36"W x 24"D CABINET WITH SUNSHIELD, PADLOCKABLE DOORS AND FULL HEIGHT BACKPAN, PROVIDE SHELF FOR (E) UPS. REINSTALL UPS.
 - 2 RTU PANEL SEE DETAIL "C", RECONNECT EXISTING I/O TO TERMINAL BLOCKS.



HARDIN LANE TANK REHABILITATION

PETALUMA, CALIFORNIA

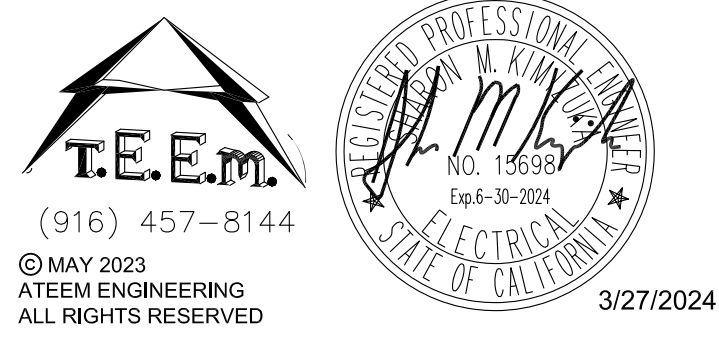
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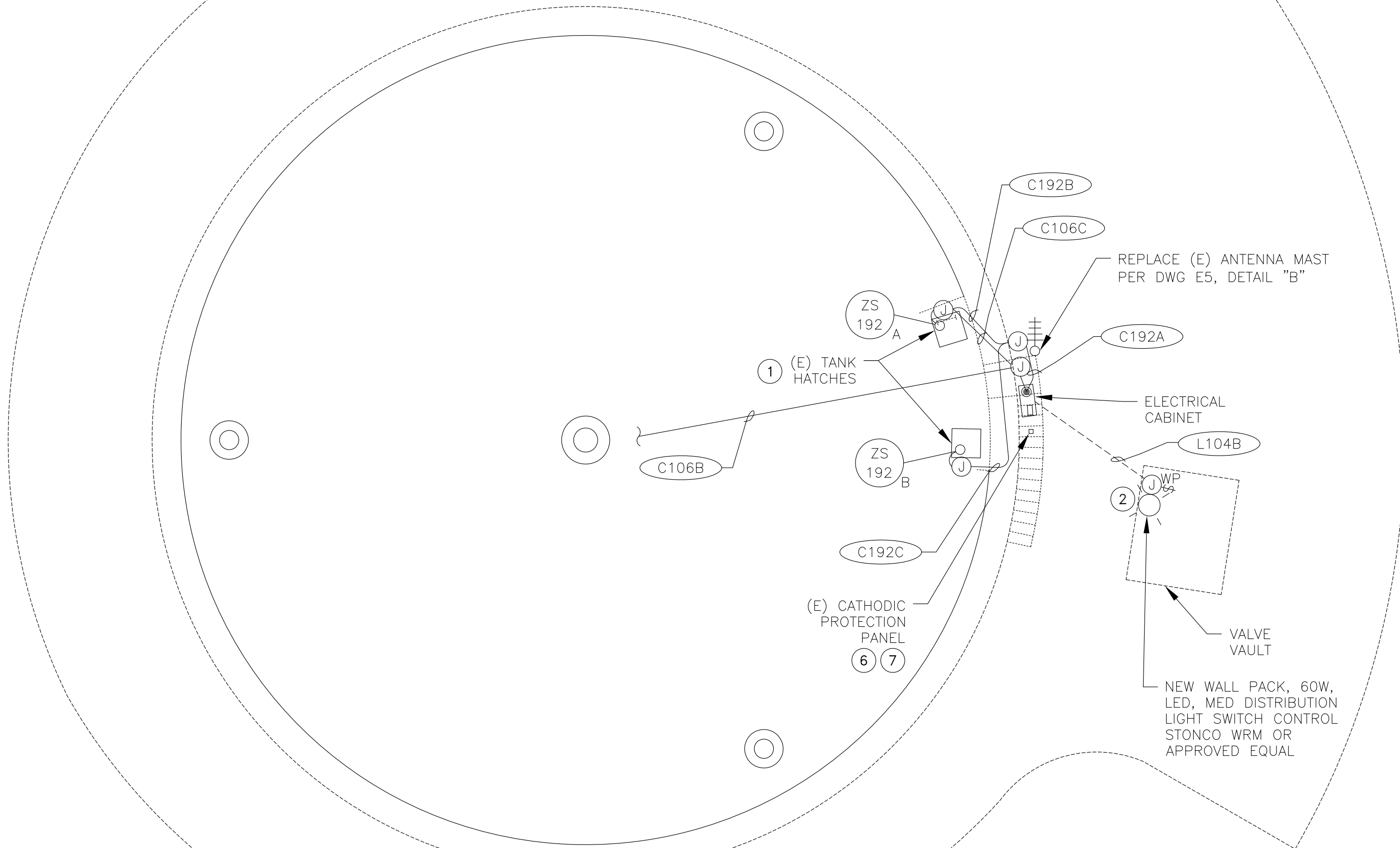
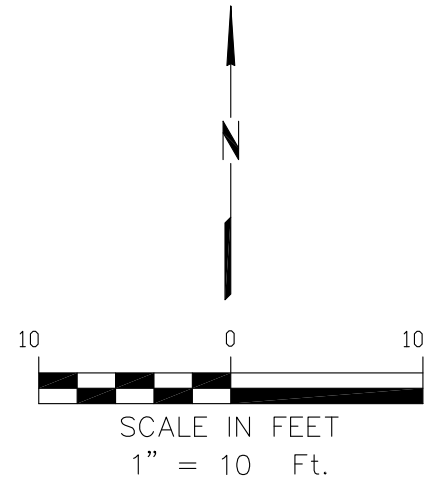
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ELECTRICAL CABINET, E3

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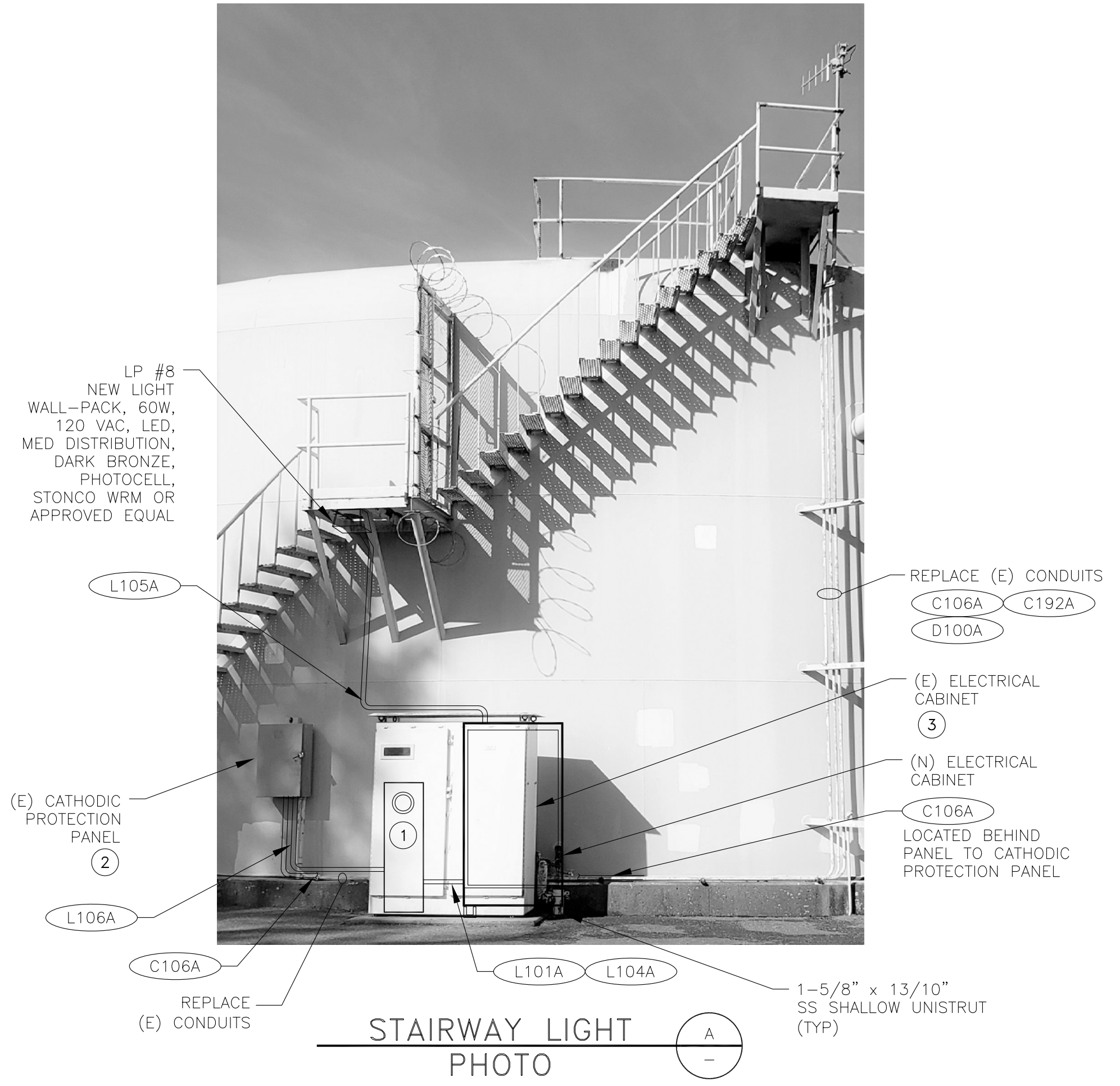


ELECTRICAL SITE PLAN ③④⑤

- NOTES:
- ① REPLACE (E) TANK HATCH SWITCHES (2 EACH) PER DWG E5, DETAIL "A" & RECONNECT WIRES.
 - ② REUSE (E) PUMP CONDUIT & WIRE.
 - ③ THERE ARE EXISTING CONDUITS, PIPES AND GAS LINES, NOT SHOWN WHICH SHALL BE PROTECTED FROM DAMAGE. REPLACE OR REPAIR ALL DAMAGED EXISTING UTILITIES AT NO ADDITIONAL COST TO OWNER.
 - ④ NOT ALL EXISTING CONDUITS SHOWN. CONDUITS SHOWN ARE THOSE ASSOCIATED WITH NEW WORK.

- ⑤ ALL JUNCTION BOXES (J-BOX) AND SWITCHES SHALL BE PVC COATED WEATHERPROOF (WP) BOXES.
- ⑥ EXISTING PANEL, CONDUITS, WIRES AND OTHER COMPONENTS ARE TO BE REUSED. REMOVE TO ACCOMMODATE OTHER SITE WORK, THEN REPLACE.
- ⑦ COORDINATE END LOCATION OF CATHODIC CONDUIT WITH OWNER.

CONDUIT & WIRE ROUTING SCHEDULE														
REF DWG	CONDUIT NO.	FROM	TO	QTY	SIZE	TYPE	PWR QTY	SIZE	GND SIZE	CONTROL QTY	SIZE	SIGNAL QTY	SIZE	NOTES
E4	C 106 A	CATHODIC PROTECTION	J-BOX	1	1"	GRS	-	-	-	-	-	-	-	PULLROPE
E4	C 106 B	J-BOX	CATHODE PROTECT ANODE	1	1"	GRS	-	-	-	-	-	-	-	PULLROPE
E4	C 106 C	J-BOX	CATHODE PROTECT ANODE	1	1"	GRS	-	-	-	-	-	-	-	PULLROPE
E4	C 192 A	ELECTRICAL CABINET	J-BOX	1	1"	GRS	-	-	#12	8	#14	-	-	
E4	C 192 B	J-BOX	ZS191A	1	3/4"	GRS	-	-	#12	4	#14	-	-	
E4	C 192 C	J-BOX	ZS191B	1	3/4"	GRS	-	-	#12	4	#14	-	-	
E4	D 100 A	ELECTRICAL CABINET	ANTENNA	1	1"	GRS	-	-	#8	-	-	1	COAX	
E4	L 101 A	METER PEDESTAL	ELECTRICAL CABINET	1	1"	GRS	6	#10	#10	-	-	-	-	CABINET RECPT/HTR/LT
E4	L 104 A	METER PEDESTAL	ELECTRICAL CABINET	1	1"	GRS	4	#10	#10	-	-	-	-	VAULT & STAIR LT
E4	L 104 B	ELECTRICAL CABINET	VAULT LIGHT	1	-	EXISTING	-	-	-	-	-	-	-	Extend (E) conduit & wires
E4	L 105 A	ELECTRICAL CABINET	STAIR LIGHT J-BOX	1	1"	PVC-40	4	#10	#10	-	-	-	-	
E4	L 106 A	METER PEDESTAL	CATHODIC PROTECTION	1	1"	GRS	4	#10	#10	-	-	-	-	



- NOTES:
- ① NEW UTILITY METER/MAIN PEDESTAL INSTALLED PER DWG E2.
 - ② TURN OVER TO OWNER.
 - ③ SHIFT NEW ELECTRICAL CABINET TO THE RIGHT TO ALLOW NEW UTILITY METER/MAIN CABINET TO REUSE (E) CONDUIT FROM PG&E.

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HARDIN LANE TANK REHABILITATION

PETALUMA, CALIFORNIA

REVISIONS		
NO.	DATE	DESCRIPTION

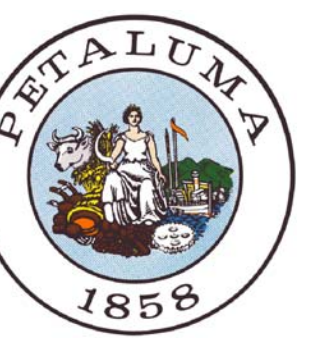
ON A FULL-SCALE DRAWING, LENGTH OF BAR BELOW IS 1-INCH. IF BAR MEASURES LESS THAN 1-INCH, THIS SHEET WAS PLOTTED AT A REDUCED SCALE, WHICH MAY REQUIRE ADJUSTMENT OF SCALE(S) SHOWN ON DRAWING.

PROJECT 4754.02	DATE MARCH 2024
DRAWN BY ZKV	CHECKED BY SMK

ELECTRICAL SITE PLAN, E4

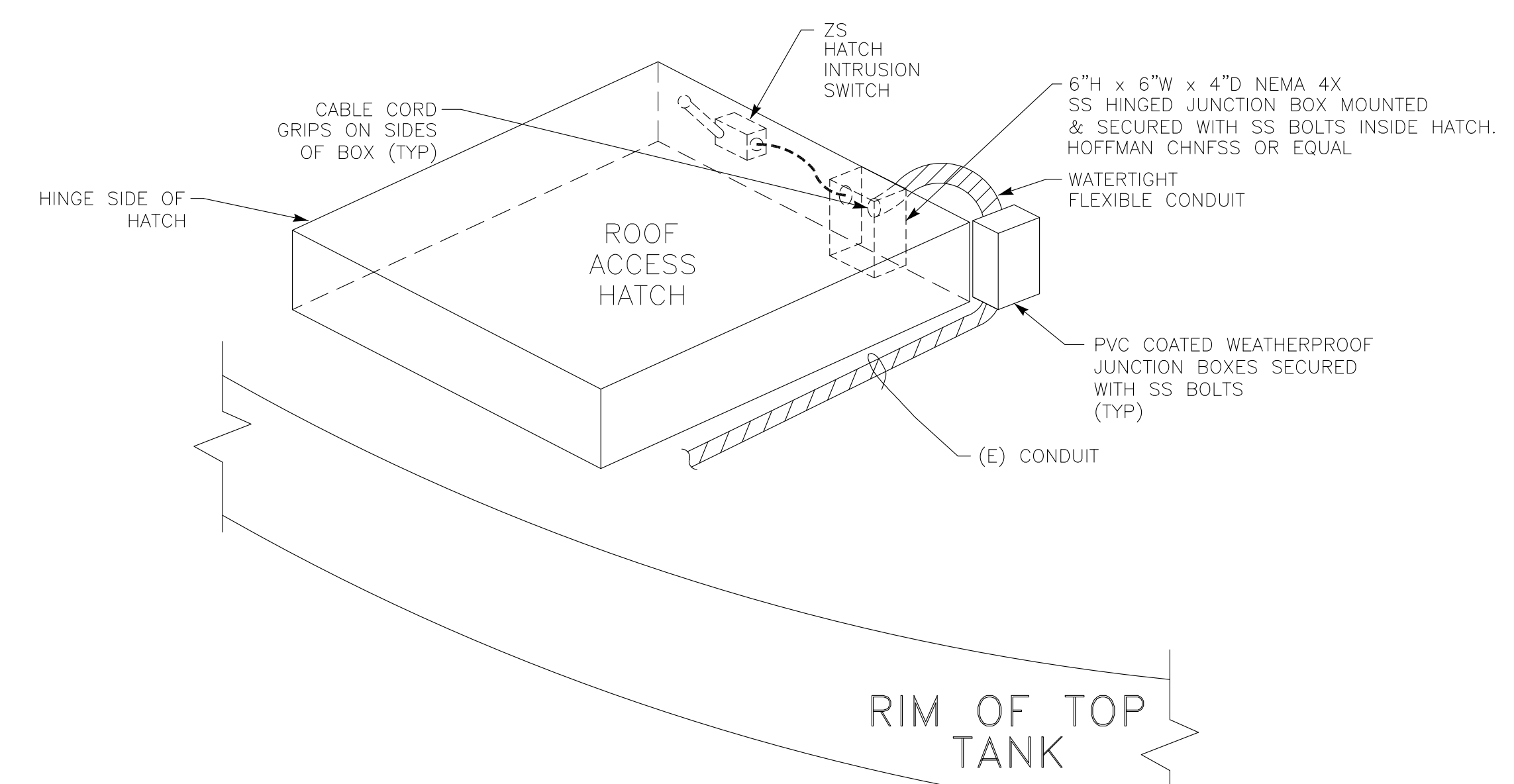
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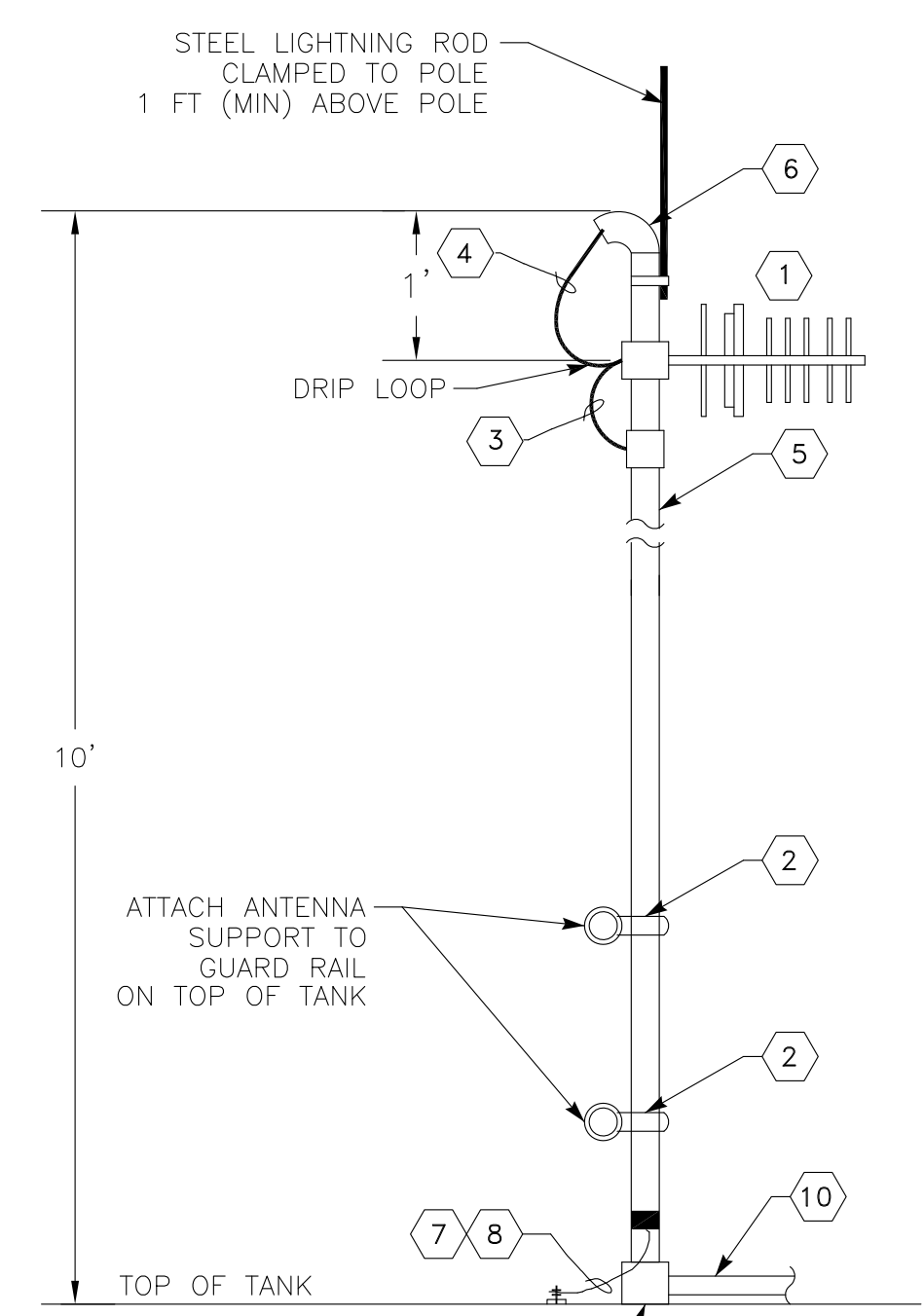
**HARDIN LANE
 TANK
 REHABILITATION**

PETALUMA, CALIFORNIA



TANK HATCH (A) (E5)
 NOT TO SCALE DETAIL

NOTES: ① THIS DETAIL SHOWS GENERAL INSTALLATION REQUIREMENTS. ADJUST ACCORDINGLY FOR HATCH ARRANGEMENT SHOWN ON CIVIL DWGS.



ANTENNA MAST HANDRAIL MOUNTING (B) (E5)
 NOT TO SCALE DETAIL

- KEY NOTES**
- ① DIRECT YAGI FOR OPTIMUM SIGNAL STRENGTH.
 - ② GALVANIZED OR STAINLESS STEEL U-BOLTS MINIMUM 3/8".
 - ③ COAXIAL CABLE GROUNDING KIT. ANDREW SURE GROUND OR EQUAL.
 - ④ 3/4" WEATHERPROOF COAXIAL CABLE CONNECTED TO ANTENNA WITH CONNECTOR THAT HAS WEATHER SEAL COVERING.
 - ⑤ 1" GRS, 10' IN LENGTH WP ELBOW INTO SIDE OF BOX.
 - ⑥ 1" WEATHERHEAD
 - ⑦ #1/0 COPPER GROUND WIRE.
 - ⑧ CONNECT TO TANK HANDRAIL SUPPORT USING BOLTED UL APPROVED GROUND CLAMP CONNECTION.
 - ⑨ 8" x 8" x 4" STAINLESS STEEL JUNCTION BOX. HOFFMAN CHNFSS OR EQUAL. DRILL DRAIN HOLE IN BOTTOM.
 - ⑩ CONDUIT PER CONDUIT SCHEDULE.

REVISIONS		
NO.	DATE	DESCRIPTION

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**TYPICAL
 ELECTRICAL
 DETAILS, E5**

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