SITZMARK HYDROPNEUMATIC PUMP STATION REPLACEMENT

CONTRACT DOCUMENTS

JULY 2026

Truckee Donner Public Utility District
11570 Donner Pass Road
Truckee, California 96160-0309
(530) 587-3896

GENERAL CONDITIONS
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SECTION 00030 – NOTICE TO BIDDERS

Notice is hereby given that the Board of Directors of Truckee Donner Public Utility District, Nevada County, California, herein referred to as the "DISTRICT", will receive sealed bids at the District office, 11570 Donner Pass Road, Truckee California 96161 until 3:00 PM, Thursday, August 20, 2026, at which time they shall be opened and publicly read for:

SITZMARK HYDROPNEUMATIC PUMP STATION REPLACEMENT

The WORK of this Contract comprises the construction of the following:

- Hydropneumatic pump station including the building structure, mechanical and electrical; skid pump; hydropneumatic tank; water piping and all other components required for system operation
- Site piping with ancillary items such as fittings, valves, locator wire, marking tape and other appurtenances
- Site work including grading and AC paving
- Relocation of existing diesel powered standby generator
- Demolition of the existing pump station structure

Bidding Documents are provided to prospective Bidders to enable them to prepare a Bid. Documents required to be submitted with the Bid are identified in Section 00100 - Instructions to Bidders.

This project is a public works project and is subject to compliance monitoring and enforcement by the California Department of Industrial Relations (DIR), in accordance with the California Labor Code Section 1770, et seq. No contractor or subcontractor may be listed on a bid for a public works project and no contractor or subcontractor may be awarded a contract for public works unless registered with the DIR, pursuant to Labor Code Section 1725.5.

The successful Bidder shall not pay less than the prevailing rate of per diem wages as determined by the Director of the DIR. Copies of the prevailing rate of per diem wages are on file with the DIISTRICT and may also be found on the DIR website at www.dir.ca.gov/dlsr/statistics_research.html. Questions pertaining to predetermined wage rates should be directed to the California Division of Labor Statistics and Research,

No bid will be considered unless it is made on the form provided and accompanied by Certified Check, Cashier's Check, or Bidder's Bond for 10% of the amount of the Bid, made payable to the "Truckee Donner Public Utility District". The above-mentioned check or bid bond shall be given as a guarantee that the Bidder executes the Contract, if it be awarded to it, in conformity with the Contract Documents. If a Bidder's Bond is used, the bond shall be conditioned such that the Bidder will pay the DISTRICT as liquidated damages the amount specified in the bond unless it enters into a Contract in accordance with its Bid and furnishes Performance and Payment Bonds as described below.

Within 15 days after the notification of the Award of the Contract, the successful bidder or bidders will be required to furnish Performance and Payment Bonds in an amount equal to one

hundred percent (100%) of the Contract Price. Said bonds shall be secured from a Surety Company satisfactory to the DISTRICT.

Pursuant to Section 22300 of the Public Contract Code of the State of California, the Contract will contain provisions permitting the successful bidder to substitute securities for any moneys withheld by the District to ensure performance under the Contract.

Each Bid must conform to the requirements of the Contract Documents, all of which may be examined at the offices of the DISTRICT: 11570 Donner Pass Road, Truckee, California, 96161. Copies of the Contract Documents may be obtained in electronic format at no charge upon request.

The DISTRICT reserves the right to reject any and all bids, waive any irregularities or informalities in the bidding, be the sole judge of the suitability of the items offered, and to accept any bid that it determines to be in its best interest.

END OF SECTION 00030

SECTION 00100 – INSTRUCTIONS TO BIDDERS

1. NOTICE TO BIDDERS

Truckee Donner Public Utility District, hereinafter referred to as "DISTRICT," advises that sealed bids subject to the conditions contained herein, will be received at the DISTRICT office until 3:00 PM, Thursday, August 20, 2026, at which time they shall be opened and publicly read for:

SITZMARK HYDROPNEUMATIC PUMP STATION REPLACEMENT

2. BID FORM

Bidders shall use the bid forms bound in these documents as Bid Forms. Each Bid must include the following:

- All pages of the Bid Forms (Section 00300). Information listed on the Experience Statement in the Bid Forms shall include documentation that the Bidder meets all of the Contractor Qualification requirements indicated in Article 1.06.A of Section 13209D – Welded Steel Tank Rehabilitation
- Certification Regarding Debarment and Other Matters (Section 00350)
- Iran Contracting Act Certification (Section 00360)
- Public Works Contractor Registration Certification (Section 00370)
- An acceptable bid security. The form of Bid Bond provided in Section 00435 – Bid Bonds may be used, or the Bidder may use another form of bid security as described in Article 1.5 of this Section.

It is not necessary for the Bidder to submit the entire set of Contract Documents with its bid.

3. DEFINED TERMS

Terms used in the Section 00100 – Instructions To Bidders, Section 00500 – Agreement, Section 00800 – Special Provisions have the meanings assigned to them in Article 1.1 of Section 00800 – Special Provisions.

4. COMPLIANCE WITH CONTRACTOR'S LICENSE LAWS

A. Pursuant to Section 7028.15 of the Business and Professions Code and Section 3300 of the Public Contract Code, Bidders must possess licenses issued by the State of California Contractors License Board for performance of this Contract. Subcontractors must possess the appropriate licenses for each specialty subcontracted.

B. Joint venture Bidders must possess a joint venture license. Each party to a joint venture must be properly licensed for the work of this Project.

C. The following conditions shall also apply:

1. No contractor or subcontractor may be listed on a Bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]

2. No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5; and

3. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

5. BID SECURITY

Each Bid shall be accompanied by a certified or cashier's check payable to the order of the Truckee Donner Public Utility District, for a sum not less than 10% of the amount of the Bid, or accompanied by a Bid Bond on the form attached or other acceptable form in an amount not less than 10% of the amount of the Bid provided by a surety licensed to do business in the State of California and appearing on Treasury Department Circular 570, as amended, conditioned that the Bidder will pay the DISTRICT as liquidated damages the amount specified in the bond unless it enters into a contract in accordance with its Bid and furnishes the insurance certificate, and payment and performance bond herein mentioned, within fifteen (15) days from the date at which it is notified that it is the successful bidder.

6. EXAMINATION OF CONDITIONS

A. Bidders shall satisfy themselves as to the conditions by personal examination of the Contract Documents and site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the proposed improvements and by other examinations and investigations that they may wish to make as to the nature of the work and the difficulties encountered.

B. Submitting of a Bid shall constitute affirmation by the Bidder that they have complied with the following:

1. Carefully examined the Contract Documents.

2. Visited the site of the Work.

3. Included in the Bid sum amounts sufficient to cover all items required by the Contract Documents and any applicable permits.

C. The failure or omission of any Bidder to receive or examine any form, instrument, addendum, or other documents or the site of the proposed Work shall in no way relieve any Bidder from any obligation with respect to its Bid or the Contract.

7. INTERPRETATION OR CORRECTION OF CONTRACT

A. The Bidder shall promptly notify the DISTRICT of any ambiguity, inconsistency, or error which they may discover in the Contract, or, if applicable, the site or local conditions.

B. If the Bidder requires clarification or interpretation of the Contract, they shall make a written request to reach the DISTRICT at least seven (7) days prior to the scheduled bid opening. Questions may be sent via email to neilkaufman@tdpud.org.

C. Any interpretations, corrections, or changes to the Contract prior to the bid opening shall be made by addenda issued to all Bidders. Each Bidder shall acknowledge receipt of each addendum in the Bid Forms.

D. Interpretations, corrections, or changes of the Contract prior to Bid opening made in any other manner than as described above will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

8. PRE-BID CONFERENCE

A. A pre-bid conference will be held at 3:00 p.m. on Wednesday, August 5, 2026. The conference will be held at the District Office at 11570 Donner Pass Road, Truckee, California, 96161.

B. Attendance at the pre-bid-conference is OPTIONAL. Representatives of the DISTRICT will be present to discuss the Project. In response to questions arising at the conference, the DISTRICT will issue Addenda as the DISTRICT considers necessary.

C. A site tour will be included in the prebid conference. Bidders shall be responsible to furnish their own transportation and persons attending the conference and site tour shall comply with appropriate social distancing and personal protection requirements.

D. The DISTRICT reserves the right to change the format of the pre-bid conference due to inclement weather. Such changes may include moving the pre-bid conference to an on-line platform such as Microsoft Teams or Zoom, and/or creating a self-guided tour where interested Bidders may tour the Project site on their own. Any modifications to the pre-bid conference format will be communicated as an Addendum.

9. LISTING OF SUBCONTRACTORS

A. Bidders shall list, in the Subcontractor List of the Bid Forms, the name, the location of the place of business, the California contractor license number, and public works contractor registration number issued pursuant to Section 1725.5 of the Labor Code of, and the portion of the Work to be performed by, each Subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the contract documents, 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 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.

B. The attention of Bidder is directed to Public Contract Code §4100, et seq. (Subletting and Subcontracting Fair Practices Act), related to penalties for use of unauthorized Subcontractors or by making unauthorized substitutions.

10. BIDDER QUALIFICATIONS

A. Bids will be received from qualified Bidders only. By submitting a Bid, Bidder warrants that it has:

1. Adequate financial resources to accomplish Work required.

2. Adequate equipment to accomplish Work required.

3. Personnel with sufficient experience to accomplish Work required.

4. Sufficient experience in the type of Work proposed.

5. Not violated public works laws as set forth in Labor Code Section 1777.7 related to apprentice/journeyman ratio.

6. The appropriate contractors' license for the Work to be performed (P.C.C. §3300), which the DISTRICT has determined to include: A-General Engineering.

7. No pending claims regarding performance, failure to deliver, labor violations, etc.

8. Ability to provide proof of Workers' Compensation, public liability and property damage insurance.

11. NONCOLLUSION AFFIDAVIT

In accordance with Public Contract Code Section 7106, Bidders are required to execute and submit the "Noncollusion Affidavit" included in the Bid Forms.

12. BID FORMS

A. Bidders are furnished with Section 00300 - Bid Forms. The Bid Forms may contain a schedule of items requesting lump sum prices. It may also state estimated quantities of various kinds of Work to be performed, or materials to be provided, with a schedule of items for which unit prices are required.

B. The unit prices or lump sum pricing must include full compensation for providing all labor, materials, services, tools, equipment and whatever else is required to perform all work in accordance with the requirements of the Contract Documents.

C. All Bids must be submitted on the Bid Forms furnished by the DISTRICT, and the Bidder is solely responsible to diligently follow all directions required by the DISTRICT with respect to the completion and submission of the Bid Forms, including these Instructions and as required under the Bid Documents. A Bid not submitted on the

form furnished by the DISTRICT, or that does not comply with the DISTRICT's directions with respect to the completion and submission of the Bid Forms, may be considered non-responsive by the DISTRICT in its sole discretion. The DISTRICT reserves all rights to reject any or all Bids, and to waive any minor irregularity in the completion of the Bid Forms, within its sole discretion.

D. The Bid Forms, and all other Bid Documents shall be executed in accordance with applicable Laws and Regulations, and as required under the Contract Documents, subject to the following:

1. Numbers shall be stated both in writing and in figures where so required.

2. In case of a difference in written words and figures, the amount stated in written words shall govern.

3. The completed forms shall be without interlineations, alterations, or erasures.

4. A correction to mistakes made by Bidder on figures or statements shall be validated with signed initials by the person or persons signing the Bid Forms.

5. The Bid shall be executed by the person or persons legally authorized to bind the Bidder, as required in Bid Forms.

6. As stated in Bid Forms, by signing the Bid Forms, Bidder represents that the statements made therein and elsewhere in the Bid Documents are true and correct and subject to penalty of perjury under California law.

E. Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed by the secretary or an assistant secretary.

F. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature.

G. The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which must be filled in on the Bid Forms).

13. MANNER OF SUBMITTING BIDS

A. Prior to submitting Bids, bidders must make sure that:

1. The Bid is complete and signed.

2. The Bid security in the proper amount is attached to the Bid package.

3. The Bid schedule is complete and the totals are correct.

4. The Bidder has acknowledged the receipt of any Addenda.

5. The Bidder has familiarized itself with all applicable laws and regulations. It is the sole responsibility of the Bidder to ensure that its Bid is received at the proper

time and at the proper location. Bids received after the time fixed for receiving them will not be considered.

6. Late Bids will be returned by the DISTRICT to the Bidder unopened.

7. When submitting a bid, place the complete bid document in a sealed envelope, mark the envelope “Sealed Bid” and mail to Sitzmark Hydropneumatic Pump Station Replacement Bid, Attn: Contract Administrator, Truckee Donner PUD, 11570 Donner Pass Road, Truckee, CA 96161. Bid documents shall be submitted in hard copy. Bid packages submitted in electronic form shall not be acceptable.

B. The Bidder certifies that in submitting its Bid it has taken into account all conduct which can be reasonably expected arising out of social distancing requirements and changes in the nature of construction means and methods including as arising out of the health and safety directives issued by all applicable governmental agencies and levels (Federal, State and local) due to the COVID-19 pandemic, and related matters. Bidder expressly represents that it has, to the best of its ability, taken all such factors, directives and requirements into account in formulating its Bid for the Work and has satisfied itself that all such costs are included in the total Bid price set forth in its Bid.

14. BID MODIFICATIONS

Bids may be modified up until the time of bid opening. Modifications must be in writing and may be sent in writing only must comply with the bid requirements. Modifications received via telephone, facsimile machine, or electronic mail will not be allowed.

15. BID WITHDRAWAL

Bids may be withdrawn any time prior to the time set for Bid opening only by written request of the Bidder. Withdrawal of a Bid does not prejudice the right of the Bidder to file a new Bid at any time prior to the time fixed for receiving Bids in this Instruction to Bidders. Once Bids are opened, Bids may only be withdrawn in strict accordance with the provisions of Public Contract Code Sections 5100 through 5107. All Bids shall be deemed a firm offer for not less than forty-five (45) days after the date of the Bid opening.

16. POSTPONEMENT OF OPENING

The DISTRICT reserves the right to postpone the time and date of bid opening as the DISTRICT deems necessary. Such postponement will be conveyed to all Bidders by written or facsimile notice which will state the new opening time and date.

17. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids will remain subject to acceptance for forty-five (45) days after the day of the Bid Opening, which may be extended by agreement between the Bidder and the DISTRICT. The DISTRICT may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

18. ENVIRONMENTAL PROVISIONS

It shall be the duty of the Bidder to familiarize itself with, and to comply with applicable environmental laws for the Work.

19. AWARD OF CONTRACT

A. Bidders must bid all of the items on the Bid Schedule. The DISTRICT intends to award one contract for the construction described in the Bid Schedule. The lowest Bid will be determined by the DISTRICT, based on the "Total Amount Of Bid" given on the bottom of the Bid Schedule on Page 00300-2 of the Bid Forms.

B. The DISTRICT reserves the right to reject any and all Bids and to waive any and all irregularities. The DISTRICT reserves the right to reject any nonconforming, nonresponsive, incomplete, unbalanced or conditional Bids.

C. In evaluating Bids, the DISTRICT will consider whether or not the Bids comply with the prescribed requirements, and include such Alternates, unit prices and other data, as may be required in the Bid Forms and supplements thereto. Further, the DISTRICT may reject any Bid, which, in its opinion, does not accurately reflect the cost to perform the Work. The DISTRICT may reject as non-responsive any Bid which unevenly weights or allocates costs, including but not limited to overhead and profit to one or more particular bid items.

D. In the event that the product of a unit and an estimated quantity does not equal the extended amount quoted, the unit price shall govern, and the correct product of the unit price and the estimated quantity shall be deemed to be the amount bid. If the sum of two or more items in a bidding schedule does not equal the total amount quoted, the individual item amounts shall govern and the correct total shall be deemed to be the amount bid.

E. All quantities stated on the Bid Schedule are estimates only. The DISTRICT in no way guarantees that the actual quantities for Work performed will be equal to or similar to the estimated quantities.

F. The DISTRICT may accept any Alternate without regard to the order in which they are listed. The DISTRICT will determine the lowest Bidder on the basis of the Base Bid. The DISTRICT reserves the right to add to the Basis of Bid any of the Alternates accepted in finalizing the contract.

G. If the Contract is to be awarded, the DISTRICT shall issue a Notice to Award, and the Contract will be awarded to the lowest qualified, responsible and responsive Bidder that in the DISTRICT's judgment will be in the best interests of the Project.

20. INSURANCE

The DISTRICT's requirements for insurance are set forth in Section 00500 - Agreement. The Successful Bidder shall purchase insurance from an insurance company or companies who meet the requirements as set forth in the Contract Documents, including, without limitation, Section 00500 - Agreement.

The Successful Bidder shall procure all insurance required under the Contract Documents, and deliver all required insurance certificates to the DISTRICT and Engineer prior to beginning work. In no case will the Notice to Proceed be considered as allowing the Work to begin until the insurance certificates are received by the DISTRICT, even though the Contract Time as stated in the Notice to Proceed will commence to run.

21. SIGNING OF AGREEMENT

When the DISTRICT gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within fifteen (15) days thereafter, the Successful Bidder shall sign and deliver the required number of counterparts of the Agreement together with the required Bonds to the DISTRICT. Within ten (10) days thereafter the DISTRICT will deliver one fully signed counterpart to the Successful Bidder.

22. RETAINAGE

The percentage of retainage that will be withheld from each Progress Payment is set forth in the Agreement. Pursuant to provisions of Section 22300 of the California Public Contract Code, the Bidder may substitute securities for any monies withheld by the DISTRICT to ensure performance of the Work.

23. CONTRACT

The Contract includes the Notice to Contractors, Instructions to Bidders, and Bidding Documents, Agreement, Performance and Payment Bond, Special Provisions, Technical Specifications, Change Orders, Field Orders, Drawings and Addenda and together they are the Contract Documents.

The Agreement, when executed, shall be deemed to include the entire agreement between the parties thereto, and the CONTRACTOR shall not claim any modification thereof resulting from any representation or promise made at any time by any officer, agent or employee of the DISTRICT or by any other person.

24. TIME OF COMPLETION

Pursuant to the provisions of Section 00500 – Agreement, the Work must be completed by June 30, 2028. It is anticipated that Board of Directors will award a contract at its September 2, 2026 meeting.

25. WAGE RATES

A. Pursuant to provisions of the California Labor Code, the Director of Industrial Relations has ascertained the prevailing rate of per diem wages in the locality in which the work is to be performed, applicable to the work to be done. Copies of these wage determinations are on file with the DISTRICT.

B. Bidders shall notify the DISTRICT promptly, in writing, of labor classifications not listed in the prevailing wage determination but necessary for the performance of the Work.

When a labor classification not listed in the prevailing wage determination is necessary for the performance of the Work, the Bidder may be required to pay, for the classifications not listed, the rate applicable to the classification most closely related to that which is not listed.

C. The Bidder shall pay not less than the prevailing rate of per diem wages determined by the Director of Industrial Relations, and the Bidder shall be responsible for its Subcontractors paying not less than said per diem wages. The Bidder may be subject to penalties for paying less than the prevailing wages pursuant to provisions of California Labor Code, Section 1775.

26. BID PROTEST PROCEDURE

A. All disputes and/or protests regarding the bidding process shall be subject to the following procedures. In submitting a Bid to the DISTRICT, the Bidder agrees to comply with and to be bound by these procedures.

B. Any Bid protest must be submitted in writing and received by the DISTRICT before 5:00 p.m. on the fifth (5th) working day following Bid opening (“Bid Protest Deadline”).

C. The initial protest document must contain a complete statement of the basis for the protest, and all supporting documentation.

D. 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.

E. The protest must refer to the specific portion of the Contract Document which forms the basis for the protest.

F. The protest must include the name, address and telephone number of the person representing the protesting party.

G. The party filing the protest must, by or before the Bid Protest Deadline, and concurrent with its delivery to the DISTRICT, transmit (via fax or e-mail) 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, including the protested Bidder. Such parties shall include, without limitation, all other Bidders who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest. Evidence that the protesting Bidder has complied with this requirement shall be provided at the time the Bid protest is submitted to the DISTRICT.

H. The protested Bidder may submit a written response to the protest, provided the response is received by the DISTRICT before 5:00 p.m., within five (5) working days after the Bid Protest Deadline or after receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation, and any materials submitted after the Response Deadline will not be considered. The response must include the name, address and telephone number of the person representing the protested Bidder.

I. 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 timely 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.

END OF SECTION 00100

SECTION 00300 – BID FORMS

SITZMARK HYDROPNEUMATIC PUMP STATION REPLACEMENT

TO: TRUCKEE DONNER PUBLIC UTILITY DISTRICT
11570 Donner Pass Road
Truckee, California 96161

ENTER INTO CONTRACT
The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the DISTRICT in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid, and in accordance with the other terms and conditions of the Contract Documents.

ACCEPTANCE OF TERMS AND CONDITIONS
Bidder accepts all of the terms and conditions of the Notice to Bidders and Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for forty-five (45) after the day of Bid opening.

RECEIPT OF ADDENDA
The undersigned Bidder acknowledges receipt of the following Addenda:

No. 1:	_____	signed	_____	dated
No. 2:	_____	signed	_____	dated
No. 3:	_____	signed	_____	dated
No. 4:	_____	signed	_____	dated
No. 5:	_____	signed	_____	dated
No. 6:	_____	signed	_____	dated
No. 7:	_____	signed	_____	dated
No. 8:	_____	signed	_____	dated
No. 9:	_____	signed	_____	dated

BID SCHEDULE

BID ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	SUBTOTAL
1	Mobilization	1	LS	_____	_____
2	Clearing and Grubbing	1	LS	_____	_____
3	Erosion Control BMPs	1	LS	_____	_____
4	Grading and Site Development	1	LS	_____	_____
5	Booster Pump Station Building	1	LS	_____	_____
6	Packaged Booster Pump Assembly	1	LS	_____	_____
7	8” Inlet and Outlet Pipeline and Fittings	150	LF	_____	_____
8	6” Fire Hydrant Laterals	43	LF	_____	_____
9	Reinstall Fire Hydrant Assemblies	2	EA	_____	_____
10	Booster Pump Station Mechanical	1	LS	_____	_____
11	Electrical and Instrumentation	1	LS	_____	_____
12	Relocate Standby Generator	1	LS	_____	_____
13	Demolition and Removal of Existing Pump Station	1	LS	_____	_____
14	A.C. Pavement and Base	1,040	SF	_____	_____
15	Rock Excavation	10	HR	_____	_____
16	All Other Work Required by the Contract Documents	1	LS	_____	_____
			Total Amount of Bid:		_____

CALIFORNIA CONTRACTOR'S LICENSE AND ENTITY INFORMATION

The terms used in this Bid are defined in the Section 00800 – Special Provisions and the Contract Documents and shall have the same meanings assigned to them. Bidder declares that it will possess a contractor's license of the required classification, valid in the appropriate jurisdiction at the time of contract award.

Contractor's license number(s): _____

License classification(s): _____

License expiration date(s): _____

SUBMITTED on _____, 20_____.

Bidder must provide the following information if Bidder is:

An Individual/Sole Proprietorship:

Name (typed or printed):_____

By: _____ (SEAL)
(Individual's signature)

Doing business as:_____

Business Address:_____

Phone Number: ( )_____ FAX Number: ( )_____

Email Address of Authorized Representative: _____

A Partnership or LLC:

Partnership or LLC Name: _____(SEAL)

By: _____
(Signature of general partner or member -- attach evidence of authority to sign)

Name (typed or printed):_____

Business address: _____

Phone Number: ( )_____ FAX Number: ( )_____

Email Address of Authorized Representative: _____

A Corporation:

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability):_____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____ (CORPORATE SEAL)

Attest: _____
(Signature of Corporate Secretary)

Business address: _____

Date of Qualification to do business is _____

Phone Number: ( )_____ FAX Number: ( )_____

Email Address of Authorized Representative: _____

A Joint Venture:

Joint Venture Name: _____(SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone Number: ( )_____ FAX Number: ( )_____

Email Address of Authorized Representative: _____

Joint Venture Name: _____(SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone Number: ( )_____ FAX Number: ( )_____

Email Address of Authorized Representative: _____

Each joint venture must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.

BIDDER'S DECLARATION

I declare under penalty of perjury under the laws of the State of California that the statements and representations in this Bid Forms are accurate, true and correct.

Dated _____ at _____, California.

By: _____

Print Name: _____

Title: _____

By signing the Bidders Declaration, the Bidder warrants the following:

NONCOLLUSION DECLARATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares: I am the _____ of,

_____ the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. 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. All statements contained in the bid are true. 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, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay any person or entity for such purpose. Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder. I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on_____[date], at_____ [city], _____ [state].

SUBCONTRACTOR LIST

(To be submitted with Bid)

Each Bidder shall set forth below with its Bid:

A. In compliance with the provisions of Sections 4100 to 4114, inclusive, of the California Public Contract Code, and any amendments thereof, the undersigned Bidder lists the name, the location of the place of business, the California contractor's license number and public works contractor registration number issued pursuant to Section 1725.5 of the California Labor Code, and the portion of the Work to be performed by each Subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a Subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the contract documents, in an amount in excess of one-half of 1 percent of the prime contractor's total Bid. The Bidder shall only list one Subcontractor for each portion of the Work as is defined by the Bidder in its Bid.

B. If the Bidder fails to specify a Subcontractor for any portion of the Work as above-stated, or if the Bidder lists more than one Subcontractor for the same portion of the Work, the Bidder agrees to perform that Work itself.

C. Bidder understands that circumvention of the requirement to list Subcontractors by the device of listing one Subcontractor who will in turn sublet portions constituting the majority of the work is a violation of the Subletting and Subcontracting Fair Practices Act (Division 2, Part 1, Chapter 4, of the California Public Contract Code), and shall subject Bidder to the penalties set forth in said Act.

[NOTE: Reproduce page two of the Subcontractor List for additional listings needed beyond the length of this form.]

Subcontractor Name	Location of Subcontractor	
	License Number	
	DIR Registration Number	
	Portion of Work Activity (%)	

Subcontractor Name	Location of Subcontractor	
	License Number	
	DIR Registration Number	
	Portion of Work Activity (%)	
Subcontractor Name	Location of Subcontractor	
	License Number	
	DIR Registration Number	
	Portion of Work Activity (%)	
Subcontractor Name	Location of Subcontractor	
	License Number	
	DIR Registration Number	
	Portion of Work Activity (%)	
Subcontractor Name	Location of Subcontractor	
	License Number	
	DIR Registration Number	
	Portion of Work Activity (%)	

EXPERIENCE STATEMENT

Following is a list of the Bidder's qualifications and experience pursuant to the requirements of Section 00100 - Instructions to Bidders.

END OF SECTION 00300

SECTION 00310
MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1 SCOPE

A. Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the Work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefor shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.

1.2 SCHEDULE OF VALUES

A. Three weeks prior to submitting the first Pay Request, Contractor shall prepare a Schedule of Values for the various portions of work as indicated in the following sections, aggregating total Contract Sum, divided so as to facilitate determination of percent complete and from which to base Pay Requests.

1.3 PAYMENT FOR ROCK EXCAVATION

A. The DISTRICT determines the number of hours spent performing rock excavation as follows:

1. For power-operated hammers and rock saws, the measurement includes all time the equipment is in use on site. The time for mobilization of the equipment to the site and time spent removing the broken up rock from the trench shall not be due additional compensation.

2. For drilling and blasting, the measurement includes time spent drilling charge holes, time spent filling and preparing the charges, time spent backfilling over the charges, and time spent excavating the backfill from over the charges. The time for mobilization of the equipment to the site and time spent removing the broken up rock from the trench shall not be due additional compensation. In the event that blasting results in more damage to the street than is customary, in the opinion of the DISTRICT, due to excess use of explosives, the CONTRACTOR shall not be due additional compensation for the time and expense incurred repairing or replacing the damaged asphalt.

3. Any exploratory drilling for rock shall be at the expense of the CONTRACTOR.

B. The quantity(ies) given in the Bid Schedule(s) for rock excavation are estimates based upon historic experience in the general vicinity and expected soil conditions. Detailed investigations of subsurface soil conditions have not been conducted in conjunction with

the preparation of the Contract Documents. There is no guaranteed minimum quantity of rock excavation to be performed and there is no guaranteed minimum compensation to the CONTRACTOR associated with rock excavation.

PART 2 – MEASUREMENT AND PAYMENT

2.1 MOBILIZATION

A. No measurement of mobilization will be made. The lump sum price for mobilization shall include all costs for obtaining all bonds, permits, and licenses; moving of equipment and materials onto the site; furnishing and erecting construction trailers and other construction facilities; and all preparatory work as required for the proper performance and completion of the project, including work items not identified in a separate bid item. The Total Price for mobilization shall not exceed five percent (5%) of the Total Bid price.

1. When the project has been established and equipment has been moved in, sixty percent (60%) of the bid item amount will be paid.

2. When ten percent (10%) of the total original Contract amount is earned from other bid items, one hundred percent (100%) of the bid item amount will be paid.

2.2 CLEARING AND GRUBBING

A. No measurement of this item will be made. The bid schedule lump sum price shall be full compensation for furnishing all the labor, materials, tools, equipment, and incidentals for clearing and grubbing the booster pump station site, including tree removal, for the lump sum price shown in the Bid Schedule.

2.3 EROSION CONTROL BMPs

A. No measurement of this item will be made. The lump sum bid price shall constitute full payment for erosion control, complete as specified. The lump sum price shall include all costs for installation of erosion control including but not limited to construction entrance, silt fencing and tree protection and all preparatory work as required for the proper performance and completion of the project.

2.4 GRADING AND SITE DEVELOPMENT

A. No measurement of this item will be made. The lump sum price shall constitute full compensation for furnishing all labor, materials, tools, equipment, and incidentals to complete this item, including but not limited to, site preparation; excavation, removal and disposal of excess or unsuitable material; rough and final grading operations, grade setting and checking, transport, moisture conditioning, blending material, screening, placement, backfilling, backfilling materials, slope cleanup and stabilization and compaction required in preparation for the booster pump station and site piping, all in accordance with the Contract Documents.

2.5 BOOSTER PUMP STATION BUILDING

A. No measurement of this item will be made. The lump sum bid price shall constitute full payment for all labor, equipment, tools, supplies and materials as well as delivery, inspection and storage of materials required to complete this item. This bid item

includes, but is not limited to, the building foundations and slab, base and compaction, housekeeping pads, trench drain, walls, doors, windows, roofing, panels, insulation, framing, rafters, stoops, finishes and hardware and all other items for a complete structure; all in accordance with the Contract Documents.

2.6 PACKAGED BOOSTER PUMP ASSEMBLIES

A. No measurement of this item will be made. The lump sum bid price shall constitute full payment for all labor, equipment, tools, supplies and materials as well as delivery, inspection and storage of materials required to complete this item. This bid item includes, but is not limited to, all pump bowls, impellers, columns, line shafts, seals, inlet and outlet manifolds, pump system skid, check valves, isolation valves, motors, testing and commissioning, and all other items required for a complete and operable pump system all in accordance with the Contract Documents.

2.7 8” INLET AND OUTLET PIPELINE AND FITTINGS

A. Measurement of 8” water pipeline and fittings will be the actual installed centerline length, in lineal feet, of new 8" pipe as determined by the DISTRICT. The CONTRACTOR will be paid for furnishing and installing 8" pipeline and fittings based on the unit prices shown in the Bid Schedule and on the DISTRICT’s determination of the length of installed pipeline. Measurement of 8” pipe will be from the outside wall of the pump station building to the various points of connection to existing DISTRICT pipelines. Payment for installation of 8" pipeline will include payment for pipe, fittings, valves, trenching, backfill, disinfection, pressure testing, and all other associated work unless specified separately in the bid schedule. No separate payment shall be made for any fittings or materials including connections to existing pipelines, except those itemized in the Bid Schedule.

2.8 6” FIRE HYDRANT LATERALS

A. Measurement of 6” water pipeline will be the actual installed centerline length, in lineal feet, of new 6" pipe as determined by the DISTRICT. The CONTRACTOR will be paid for furnishing and installing 6" pipeline based on the unit prices shown in the Bid Schedule and on the DISTRICT’s determination of the length of installed pipeline. Payment for installation of 6" pipeline will include payment for pipe, fittings, valves, trenching, backfill, disinfection, pressure testing, connection to 6” gate valves, and all other associated work unless specified separately in the bid schedule. No separate payment shall be made for any fittings or materials including connections to existing pipelines, except those itemized in the Bid Schedule.

2.9 REINSTALL FIRE HYDRANT ASEMBLIES

A. Measurement of Fire Hydrant Assemblies will be the actual number of fire hydrant assemblies installed. The bid schedule price shall be full compensation for furnishing all the labor, materials, tools, equipment, and incidentals for reinstalling the existing fire hydrants. Fire hydrant assemblies include the fire hydrant and all piping and equipment shown in the contract drawings between the water main and the fire hydrant except those items listed separately in the bid schedule. The CONTRACTOR will be paid for furnishing and installing each fire hydrant as shown on the contract drawings.

2.10 BOOSTER PUMP STATION MECHANICAL

A. No measurement of this item will be made. The lump sum bid price for shall constitute full payment for all labor, equipment, tools, supplies and materials as well as delivery, inspection and storage of materials required to complete this item. This bid item includes all interior equipment, piping and conduits; and any exterior wall mounted equipment as specified in the structural, mechanical, and civil drawings. This bid item includes, but is not limited to, all mechanical fans, louvers, heaters, dampeners thermostats and controls; interior water and buried piping to the exterior wall of the building, hydropneumatic pressure tank including compressor and accessories, interior fittings, valves, air valves, check valves, pressure gauge assemblies, flow meter, and any other water or mechanical appurtenances; all in accordance with the Contract Documents.

2.11 ELECTRICAL AND INSTRUMENTATION

A. No measurement of this item will be made. The bid schedule lump sum price shall be full compensation for furnishing all the labor, materials, tools, equipment, and incidentals for furnishing and installing the electrical and instrumentation including, grounding systems, underground conduit, duct banks, pull boxes, light fixtures and devices, panelboards, above and below ground raceway systems, wire and cable, VFDs and pump controllers, interior and exterior wall mounted electrical and communication conduit, wiring, controls, lighting, panels and equipment, installation and hanging of all SCADA components, communications, new automatic transfer switch, miscellaneous electrical equipment, transformers, power panel, alarm equipment, and startup, system testing, operations and commencement, all in accordance with the Contract Documents, for the lump sum price shown in the Bid Schedule. The CONTRACTOR shall furnish the DISTRICT with a convenient breakdown of this lump sum to allow for payment of components of this lump sum. DISTRICT is responsible for SCADA integration.

2.12 RELOCATE STANDBY GENERATOR

A. No measurement of this item will be made. The lump sum bid price for shall constitute full payment for all labor, equipment, tools, supplies and materials as well as delivery, inspection and storage of materials required to complete this item. This bid item includes relocating and reinstalling the existing generator, generator electrical connections, testing, and commissioning. This item includes, but is not limited to, generator installation, concrete generator pad, generator seismic bracing, electrical and communications connections and testing and commissioning all in accordance with the Contract Documents.

2.13 DEMOLITION AND REMOVAL OF EXISTING PUMP STATION

A. No measurement of this item will be made. The lump sum bid price for shall constitute full payment for all labor, equipment, tools, supplies and materials as well as hauling and permanent disposal, inspection and storage of materials required to complete this item. This bid item includes a building, concrete, mechanical and electrical equipment, above ground and buried pipe and fittings, conduit and wiring, to be hauled off-site and properly disposed of all in accordance with the Contract Documents.

2.14 A.C. PAVEMENT AND BASE

A. Measurement of asphalt concrete pavement, including aggregate base, will be the actual area of new pavement as determined by the DISTRICT, in square feet. The CONTRACTOR shall be paid based on his unit price shown in the Bid Schedule and on the DISTRICT's determination of paved area. No separate measurement will be made of temporary paving, erosion protection provided outside of paved areas, or other surface restoration activities, as these activities are deemed to have been paid for in the other unit prices.

2.15 PERFORM ROCK EXCAVATION (Bid Item No. 15)

A. Measurement of rock excavation shall be based on measurement of the actual number of hours spent by performing rock excavation work as determined by the DISTRICT. The price given by the CONTRACTOR shall include all labor, equipment, materials and subcontractors necessary to perform this Work.

B. The CONTRACTOR shall have the option of using power-operated hammers, rock saws, drilling and blasting or other appropriate rock excavation methods. The hourly rate listed shall include all compensation due to the CONTRACTOR for performing rock excavation. The CONTRACTOR **SHALL NOT** be entitled to any additional monies or compensation, including stand-by time for crew members idled during the performance of rock excavation. The CONTRACTOR shall not be due payment if its forces are unable to perform work while waiting for subcontractors or materials to arrive on the project site.

C. The use of expansive compounds or similar methods that have a time delay associated with their effectiveness shall be reviewed on a case-by-case basis and the CONTRACTOR shall not be entitled to compensation while waiting for such methods to become effective.

D. Section 02200 – Earthwork defines the level of effort required before the DISTRICT will consider excavation work to be rock excavation. In the event that the CONTRACTOR chooses to utilize excavation equipment with a flywheel horsepower lower than that given in Section 02200, the CONTRACTOR shall not be entitled to payment for rock excavation.

2.16 FURNISH AND INSTALL ALL OTHER WORK REQUIRED BY THE CONTRACT DOCUMENTS

A. No measurement shall be made for this item. The CONTRACTOR will be compensated for all costs in this item based on the lump sum price provided in the Bid Schedule. The price given by the CONTRACTOR shall include all labor, equipment and materials necessary for all WORK in the Contract Documents not covered by the other Bid Items required for successful completion of the project.

PART 3 – EXECUTION (Not used)

END OF SECTION 00310

SECTION 00350 – CERTIFICATION REGARDING DEBARMENT SUSPENSION AND OTHER RESPONSIBILITY MATTERS

(To be submitted with Bid)

The Bidder certifies to the best of its knowledge and belief that it, and its principals:

(A) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(B) Are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any State or local government entity;

(C) Have not within a three year period preceding this Bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(D) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal. State, or local) with commission of any of the offenses enumerated in paragraph (1) or (2) of this certification; and

(E) Have not within a three-year period preceding this application/Bid had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this Bid or termination of the award.

_____

Name of Bidder

_____

Typed Name & Title of Authorized Representative

_____

Signature of Authorized Representative Date

I am unable to certify to the above statements. My explanation is attached. ☐

END OF SECTION 00350

SECTION 00360 - IRAN CONTRACTING ACT CERTIFICATION

(To be submitted with Bid)

(Public Contract Code Section 2200 et seq.)

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 et seq.) is true and correct:

☐ The Contractor is not:

(A) Identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

(B) A financial institution that extends, for 45 days or more, credit in the amount of $20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

☐ The DISTRICT has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the DISTRICT will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

☐ The amount of the Contract payable to the Contractor for the Project does not exceed $1,000,000.

Signed: _____

Titled: _____

Firm: _____

Date: _____

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of $250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

END OF SECTION 00360

SECTION 00370 - PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION
(To be submitted with Bid)

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See http://www.dir.ca.gov/Public-Works/PublicWorks.html for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder: _____

DIR Registration Number: _____

Bidder further acknowledges:

(A) Bidder shall maintain a current DIR registration for the duration of the project.

(B) Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.

(C) Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Signature: _____

Name of Bidder: _____

Name: _____

Title: _____

Dated: _____

END OF SECTION 00370

SECTION 00435 – BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____

_____

as Principal, and _____
as Surety, are hereby held and firmly bound unto _____

_____ as OWNER in the penal sum of

_____

for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____day of _____ 2026.

The Condition of the above obligation is such that whereas the Principal has submitted to

_____

a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the _____

_____

NOW, THEREFORE;

(A) If said BID shall be rejected, or

(B) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said Contract and for the payment of all persons performing labor and/or furnishing materials in connection therewith, and shall in all other respects perform the Agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the DISTRICT may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ Principal

_____ Surety

By:

*IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

END OF SECTION 00435

SECTION 00500 – AGREEMENT

SITZMARK HYDROPNEUMATIC PUMP STATION REPLACEMENT

This Agreement ("Agreement") is entered into as of the ____ day of _____2026, by and between the Truckee Donner Public Utility District, a local public agency of the State of California (the "DISTRICT") and
_____("CONTRACTOR").

The parties hereto agree as follows:

1. WORK

   The CONTRACTOR agrees, for the consideration and under the terms and conditions set forth in this Agreement and the Contract Documents, to furnish and transport all necessary labor, services, materials, tools, equipment, implements, and appliances and any and all other expenses necessary or incidental to the performance of the Work within the Contract Time required to perform and completely finish in a workmanlike manner to the satisfaction and approval of the DISTRICT, free of any and all liens and claims of laborers, materialmen, suppliers, and subcontractors, and in conformity in all respects with all applicable federal, state, county and town ordinances, rules, and regulations, the public work of improvement, hereafter referred to as the "SITZMARK HYDROPNEUMATIC PUMP STATION REPLACEMENT," consisting of construction of the hydropneumatic pump station, site piping, site grading, AC paving, relocation of existing diesel powered standby generator, demolition of existing pump station structure and related work hereafter referred to as the "Work" or the "Project", which is more fully described in the Contract Documents.

2. CONTRACT DOCUMENTS

   A. The Contract Documents include the following:

      1. Notice to Bidders (Section 00030);

      2. Instructions to Bidders (Section 00100);

      3. Bid Forms (Section 00300);

      4. Noncollusion Affidavit (Section 00300);

      5. Subcontractor List (Section 00300);

      6. Experience Statement (Section 00300);

      7. Measurement and Payment (Section 00310);

      8. Certification Regarding Debarment, Suspension and Other Responsibility Matters (Section 00350);

      9. Iran Contracting Certification (Section 00360);

10. Public Works Contractor Registration Certification (Section 00370);

11. Bid Bond (Section 00435);

12. Agreement (Section 00500);

13. Performance Bond (Section 00600);

14. Payment Bond (Section 00610);

15. Special Provisions (Section 00800);

16. Addenda numbers ____ through ____, inclusive;

17. Specifications;

18. Appendices:

19. Drawings;

20. Notice to Proceed; and

21. Executed Change Orders, if any, which may be effective after the date of this Agreement.

B. The CONTRACTOR shall keep on the Site a copy of the Contract Documents and shall at all times give the DISTRICT access thereto The Contract Documents constitute the entire Agreement between the DISTRICT and the CONTRACTOR for the Work, and supersede all prior agreements, written or oral. It is the intent of the Contract Documents to include everything necessary for the proper execution of the Work as a complete functioning facility that serves the intended purpose. The CONTRACTOR shall provide all labor, material, equipment, and services required by the Contract Documents, or that may reasonably be inferred from the Contract Documents, as being required to perform the Work and produce the intended result. Words and abbreviations which have well known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

C. Whenever two or more standards or requirements appear in the Contract Documents, the highest standard, quality or requirement shall be applied and followed in the performance of the Agreement. In the case of conflict between terms of the Contract Documents, the following order of precedence shall apply:

1. In cases of discrepancy concerning dimension, quantity and location, the Drawings shall take precedence over the Specifications. Explanatory notes on the Drawings shall take precedence over conflicting drawn indications. Large-scale details shall take precedence over smaller scale details and figured dimensions shall take precedence over scaled measurement. Where figures are not shown, scale measurements shall be followed but shall in all cases be verified by measuring actual conditions of Work already in place. In cases of

discrepancy concerning application of materials and non-technical requirements over materials, the Specifications shall take precedence over the Drawings.

2. For all other conflicts between portions or terms of the Contract Documents that cannot be resolved as set forth above, the following order of precedence shall apply:

   a. Agreement;

   b. General Conditions;

   c. Specifications; and

   d. Drawings.

3. CONTRACT PRICE

The DISTRICT shall pay to the CONTRACTOR as full compensation for the performance of the Agreement, subject to any additions or deductions as provide din the Contract Documents, and including all applicable taxes and costs, the sum of:

_____ Dollars ($_____), hereinafter referred to as the Contract Price.

4. CONTRACT TIME

Time is of the essence in the performance of the Work. The CONTRACTOR agrees to commence work within TEN (10) calendar days of the date stated in the DISTRICT's Notice to Proceed, unless other arrangements are made with the DISTRICT in writing, and agrees to carry out the Project at all times with the greatest possible dispatch and to complete the entire Project under this Agreement, as may be amended, no later than June 30, 2028, ("Contract Time"). The CONTRACTOR is referred to Section 00800 - Special Provisions for intermediate milestones. By its signature hereunder, CONTRACTOR agrees that the Contract Time, including with respect to the intermediate milestones set forth in the Special Provisions, is adequate and reasonable to complete the Work, however the time for completion may be extended by written agreement of the DISTRICT due to extraordinary weather conditions.

5. LABOR

A. In addition to any other requirements concerning labor pursuant to the Contract Documents and applicable California and federal law, the CONTRACTOR declares the Work will be conducted pursuant to the following requirements:

   1. **Wage Scale.** CONTRACTOR and its subcontractors shall pay not less than the prevailing rate of wages in accordance with the Labor Code, which rates have been determined by the Director of the California Department of Industrial Relations and shall be made available through the DISTRICT, and a copy of which is also included with the Contract Documents, the provisions of which are hereby specified as the rate of prevailing wage to be paid workers on this Project, and the provisions of Labor Code Sections 1720 et seq. and 1770 et seq., as well

as California Code of Regulations, Title 8, Section 16000 et seq. shall be complied with. The CONTRACTOR and each subcontractor shall forfeit as a penalty to the DISTRICT not more than two hundred dollars ($200) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing wage rate for any work done by him or her, or by any subcontract under him or her, in violation of the provisions of the Labor Code. The difference between such stipulated prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the CONTRACTOR. CONTRACTOR shall post, at appropriate conspicuous points on the Project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.

2. **Payroll Records.** Pursuant to Labor Code Section 1776, the CONTRACTOR and each subcontractor shall maintain weekly certified payroll records showing the name, address, social security number, work classification, straight time and overtime hours paid each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the Work. CONTRACTOR shall certify under penalty of perjury that records maintained and submitted by CONTRACTOR are true and accurate. CONTRACTOR shall also require subcontractor(s) (s) to certify weekly payroll records under penalty of perjury. In accordance with Labor Code section 1771.4, the CONTRACTOR and each subcontractor shall furnish the certified payroll records directly to the Department of Industrial Relations ("DIR") on a weekly basis and in the format prescribed by the DIR, which may include electronic submission. CONTRACTOR shall comply with all requirements and regulations from the DIR relating to labor compliance monitoring and enforcement. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement ("DLSE") of the DIR or shall contain the same information as the forms provided by the DLSE. Any copy of records made available for inspection and furnished upon request to the public 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 or any subcontractor shall not be marked or obliterated.

3. In the event of noncompliance with the requirements pertaining to the preparation and submission of certified payroll records, the CONTRACTOR shall have ten (10) days in which to comply subsequent to receipt of written notice specifying any item or actions necessary to ensure compliance with this section. Should noncompliance still be evident after such ten (10) day period, the CONTRACTOR shall forfeit one hundred dollars ($100.00) for each day, or portion thereof, for each worker until strict compliance is effectuated. Upon the request of the DIR, such penalties shall be withheld from contract payments.

4. **Hours of Labor.** Eight-hour labor constitutes a legal day's work.

5. **Apprentices**. In accordance with the provisions of Section 1777.5, 1777.6 and 1777.7 of the Labor Code, and in accordance with the regulations of the California Apprenticeship Council, properly registered, apprentices may be employed in the prosecution of the Work. Information relative to number of apprentices, identifications, wages, hours of employment and standards of

working conditions shall be obtained from the Director of the Department of Industrial Relations, who is the Administrative Officer of the California Apprenticeship Council.

B. **Prohibited Employment Discrimination.** Attention is directed to Section 1735 of the California Labor Code, which reads as follows: "No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical handicap, mental condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter."

C. The CONTRACTOR shall comply strictly with all applicable federal, state, and local requirements relating to the establishment of non-discriminatory practices in hiring and employment. During the performance of this Agreement, the CONTRACTOR and its subcontractors shall not deny the Agreement's benefits to any person on the basis of race, religion, color, ethnic group identification, national origin, ancestry, sex, age, physical or mental disability, medical condition, marital status, or sexual orientation, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, ethnic group identification, national origin, ancestry, sex, age, physical handicap, mental disability, medical condition, marital status, or sexual orientation. The CONTRACTOR shall ensure that the evaluation and treatment of employees and applicants for employment are free of such discrimination.

D. The CONTRACTOR and its Subcontractors shall comply with the provisions of the Civil Rights Act of 1964 (42 United States Code, Section 1983), Executive Orders 11246, 11375 and 11478, the Fair Employment and Housing Act (California Government Code, Section 12900 et seq.), the regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285.0 et seq.), and the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (California Government Code, Sections 11135-11139.5).

E. The CONTRACTOR and its Subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

F. The CONTRACTOR shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Agreement.

G. Workers' Compensation Insurance. In accordance with the provisions of Article 5, Chapter 1, Part 7, Division 2 (commencing with Section 1860) and Chapter 4, Part 1, Division 4 (commencing with Section 3700) of the California Labor Code, the CONTRACTOR is required to secure the payment of compensation to his employees and shall for that purpose obtain and keep in effect adequate Workers' Compensation Insurance. The undersigned CONTRACTOR is aware of the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for Workers' Compensation claims or to undertake self-insurance in accordance with the provisions of that Code, and will comply with such provisions before commencing the performance of the Work in this Agreement.

H. **Security for Compensation.** The CONTRACTOR hereby agrees that the provisions of Section 1775 of the California Labor Code will be complied with. The CONTRACTOR further agrees to secure the payment of compensation to its employees in accordance with the provisions of Section 3700 of the California Labor Code.

6. INDEMNITY

A. To the fullest extent permitted by law, the CONTRACTOR shall indemnify, defend (with independent counsel approved by the DISTRICT) and hold harmless the DISTRICT, and its directors, officers, employees, agents, representatives, and volunteers (the "Indemnified Parties"), from and against any and all liabilities (including without limitation all claims, losses, damages, penalties, fines, and judgments, associated investigation and administrative expenses, and defense costs, including but not limited to reasonable attorneys' fees, court costs and costs of alternative dispute resolution), in law and in equity, of every kind, nature or type that arise out of, pertain to, or relate to the performance of the Work, the CONTRACTOR's operations to be performed under the Contract Documents, the negligence, reckless, or willful misconduct of the CONTRACTOR or the acts or omissions of any employee, agent or subcontractor of the CONTRACTOR regardless of whether or not caused in whole or in part by a party indemnified hereunder (collectively "Claims" for purposes of this section); excepting therefrom only such Claims arising from the sole or active negligence or willful misconduct of the Indemnified Parties or defects in design furnished by those persons. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this paragraph. The provisions of this paragraph shall survive completion of the Work and/or the termination of this Contract. The provisions of this paragraph are not limited by the provisions of the Contract Documents relating to insurance. The CONTRACTOR's indemnification obligations shall apply to all damages or claims for damages suffered as a result of or by the CONTRACTOR's performance or operations regardless if any insurance is applicable or not.

B. It is intended that this section shall comply with California Civil Code §§ 2782, et seq., to the extent applicable to the CONTRACTOR's obligations as set forth in this Section. If it is determined by a Court of competent jurisdiction that any aspect of this Section exceeds the restrictions or limitations under California law applicable to indemnity obligations, only that portion which exceeds the restrictions or limitations under California law shall be null and void, and all remaining indemnity obligations shall be fully enforceable to the fullest extent allowed under California law.

C. In any and all Claims against the Indemnified Parties by any employee of the CONTRACTOR, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any subcontractor under Workers' or Workmen's Compensation Acts, disability benefit acts or other employee benefit acts.

D. The CONTRACTOR's liability to the Indemnified Parties under this Section shall not be limited by any legal limitation on the amount or type of damages, compensation or

benefits payable under workers' compensation acts, disability benefit acts or other employee benefit acts.

E. The CONTRACTOR's liability insurance shall provide coverage for the CONTRACTOR's defense and indemnification obligations.

7. INSURANCE

The CONTRACTOR shall, at its sole cost, obtain and maintain, in force and effect for the duration of the Agreement, including the Warranty period, insurance that shall protect the CONTRACTOR and its Subcontractors and suppliers, and the DISTRICT against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the CONTRACTOR, its agents, representative, employees or subcontractors and suppliers, and the following specific types of insurance coverages with limits not less than those set forth below, in a company or companies with a Best's rating of no less than A:VII and admitted to issue insurance in the State of California. Except for Builder's Risk Insurance as provided in this Section or as otherwise may be waived by the DISTRICT, in writing, in its sole discretion, the CONTRACTOR shall require compliance with all other Insurance Requirements as provided in this Section by its lower tier subcontractors.

A. Workers' Compensation Insurance, including occupational illness or disease coverage, in accordance with the laws of the nation, state, territory or province having jurisdiction over the CONTRACTOR's employees and Employer's Liability Insurance with limits the greater of the statutory requirements, or $1,000,000 per accident and, for bodily injury by disease, $1,000,000 per employee. Coverage shall include all work covered under the U.S. Longshoreman's and Harbor Workers' Compensation Act and Jones Act in the event that they are applicable to the Work, or any aspect of the Work. The CONTRACTOR shall not utilize occupational accident or health insurance policies, or the equivalent, in lieu of mandatory Workers' Compensation insurance, or otherwise attempt to opt out of the statutory Workers' Compensation system. This insurance shall contain a waiver of subrogation (also known as "Transfer of Rights of Recovery Against Others to Us") against the DISTRICT and its Board members, officers, employees, agents and consultants. The obligations of CONTRACTOR, or its Subcontractors, under this provision shall apply regardless of whether or not the DISTRICT has received a waiver of subrogation from the insurer.

B. Commercial General Liability Insurance (Occurrence Form) at least as broad as ISO Form CG 00 01 12 04, or DISTRICT approved equivalent, with a full defense and indemnity, which shall include, and be subject to, the following:

1. A minimum combined single limit of liability of $2,000,000 or the limits required by law, whichever is greater for each occurrence for bodily injury and property damage;

2. A minimum limit of liability of $1,000,000 each person for personal and advertising injury liability;

3. A minimum limit of liability of $1,000,000 each occurrence for products/completed operations liability. The products/completed operations liability shall be

maintained in full force and effect for not less than 10 years following completion of any of the CONTRACTOR's work;

4. A general aggregate limit of not less than $2,000,000, which shall be provided on a per project basis by means of ISO Form CG 25 03 11 85 or DISTRICT approved equivalent;

5. XCU coverage for claims arising from explosion, collapse and underground damage;

6. Contractor Pollution Liability Insurance coverage by the CONTRACTOR for all Work with a minimum limit of liability of not less than $2,000,000 per occurrence, and $10,000,000 policy aggregate;

7. Contractual liability coverage for all oral and written contracts including the indemnity provisions contained herein;

8. Deductibles shall not exceed $25,000 per occurrence and shall be the sole responsibility of the CONTRACTOR;

9. Cross Liability, Separation of Insureds endorsement, or coverage for Severability of Interest shall be included;

10. Claims made policies are not acceptable;

11. Coverage for Work performed on or within 50 feet of a railroad, by deletion of any limitation or exclusion of coverage on or within 50 feet of a railroad or by a Railroad Protective Liability policy which complies with this Section; and

12. An endorsement that names the DISTRICT and its directors, officers, employees, agents and consultants as additional insureds. Such endorsement shall be made upon an ISO Endorsement CG 20 10 11 85 or approved equivalent (CG 20 10 04 13 is not equivalent or acceptable), Additional Insured - DISTRICT, Lessees or CONTRACTOR (Form B) and shall state "insurance is primary and all other insurance shall be noncontributory" and shall waive all rights of subrogation against the additional insureds. Any insurance, or self-insurance, maintained by the DISTRICT, its directors, officers, employees, and authorized volunteers shall be in excess of the CONTRACTOR's insurance and shall not contribute with it.

C. Automobile Liability Insurance (Business Auto Coverage, Form CA 00 01) covering use of all owned, non-owned and hired automobiles (Symbol 1) with a minimum combined single limit of liability for bodily injury and property damage of at least $1,000,000 per occurrence, and shall include, and be subject to, the following:

1. An endorsement that names the DISTRICT and its directors, officers, employees, agents and consultants as additional insureds, states such "insurance is primary and all other insurance shall be noncontributory", and waives all rights of subrogation against the additional insureds. Any insurance, or self-insurance, maintained by the DISTRICT, its directors, officers, employees, and authorized volunteers shall be in excess of the CONTRACTOR's insurance and shall not contribute with it.;

2. (2) Cross Liability, Separation of Insureds endorsement, or coverage for Severability of Interest;

D. Builder's Risk (Course of Construction) coverage shall be provided by the CONTRACTOR utilizing an "All Risk" (Special Perils) coverage form (and shall include an installation floater (for materials and equipment)) with minimum limits of liability in the amount of the initial Contract Price as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. Until the completion and final acceptance by the DISTRICT of all the Work under and implied by the Contract, the Work shall be under the CONTRACTOR's sole responsible care and charge. The CONTRACTOR shall rebuild, repair, restore and make good all injuries, damages, re-erections, and repairs occasioned or rendered necessary by causes of any nature whatsoever. The making of progress payments to the CONTRACTOR shall not be construed as creating an insurable interest by or for the DISTRICT or be construed as relieving the CONTRACTOR or its subcontractors of responsibility for loss from any direct physical loss, damage or destruction occurring prior to final acceptance of the work by the DISTRICT. The coverage required under this Article shall also include and be subject to the following:

1. The interests of the DISTRICT, the CONTRACTOR, and each of their directors, officers, employees and authorized volunteers, officials, agents, consultants, and all tiers of subcontractors, all of whom shall be listed as insureds, or additional insureds as appropriate, and the policy shall, by endorsement, waive all rights of subrogation against the insureds and additional insureds and the endorsement shall state: "Subrogation: This insurance shall not be invalidated should the named Insured waive in writing prior to a loss, any right of recovery against any person for loss occurring to the property described.";

2. Coverage for the Completed Value. If the DISTRICT is damaged by the failure of the CONTRACTOR to maintain such insurance, the CONTRACTOR shall bear all reasonable costs properly attributable thereto;

3. Coverage against the perils of fire and extended coverage and all physical loss or damage including, without limitation or duplication of coverage: (i) lightning, windstorm, hail, smoke, explosion, riot, riot attending a strike, civil commotion, aircraft and vehicles; (ii) theft, vandalism, malicious mischief, and water damage; (iii) collapse, flood including tidal waves or overflow from bodies of water, landslide, water pressure or earth movement and earthquake; (iv) removal of debris resulting from an insured loss and demolition occasioned by enforcement of any applicable legal requirements; (v) falsework, temporary buildings and safety devices used by the CONTRACTOR to perform the Work; (vi) portions of the Work stored on and off the site and in transit when such portions of the Work are included in an Application for Payment (including Inland Marine coverage and Installation and Equipment Floater coverage as applicable); (vii) compensation for the services of the design engineer required as a result of the insured loss. (viii) flood and tidal wave insurance coverage shall be for the maximum percentage of the Contract Price permitted by law.

4. Remaining in full force and effect until the Final Payment has been made to the CONTRACTOR. The property insurance policy shall be endorsed to allow for

partial use or occupancy by the DISTRICT without permitting a cancellation or lapse of insurance coverage;

5. Deductibles shall not exceed $25,000 per occurrence with a deductible aggregate of $25,000. The CONTRACTOR shall pay for deductible losses at no cost to any other insured or additional insured. Deductibles and any self-insured retentions shall be declared to and approved by the DISTRICT. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or the DISTRICT; and

6. Unless the DISTRICT directs otherwise, a loss insured under the Builder's Risk insurance shall be adjusted with the CONTRACTOR and made payable to the CONTRACTOR as fiduciary for the insured and additional insureds. The CONTRACTOR shall deposit the insurance proceeds in a separate account and shall distribute payment to the appropriate parties in proportion to their cost for repairing or replacing the damaged Work. The CONTRACTOR shall provide a complete audited accounting of the distribution of insurance proceeds to the DISTRICT and all other parties of interest.

E. Certificates of Insurance and Endorsements

1. Prior to performing any Work, the CONTRACTOR and its subcontractors shall file with the DISTRICT, Certificates of Insurance in a form satisfactory to the DISTRICT (ACCORD form) along with a copy of all endorsements as required in this Section. All certificates and endorsements are to be received and approved by the DISTRICT before work commences. However, failure to obtain the required documents prior to the Work beginning shall not waive the CONTRACTOR's obligation to provide them. The DISTRICT reserves the right to require complete, certified copies of all required insurance policies, including policy declaration pages and endorsement pages, required by these specifications, at any time. Failure to continually satisfy the insurance requirements of the Agreement is a material breach of contract.

2. The certificates shall name each additional insured required by this Agreement, shall state "insurance is primary and all other insurance shall be noncontributory", shall waive all rights of subrogation against the additional insureds; and shall also contain a provision that the DISTRICT shall be notified in writing 30 days before the policies may be canceled or allowed to expire or any reduction in coverage. An additional certificate shall be submitted with the final Application for Payment showing required continuation of coverage beyond the Final and Payment. If CONTRACTOR maintains broader coverage and or/higher limits than the minimums required in the Contract Documents, the DISTRICT requires and shall be entitled to the broader coverage and/or higher limits maintained by the CONTRACTOR. Any available insurance proceeds in excess of the specified minimum of insurance and coverage shall be available to the DISTRICT.

8. PERFORMANCE AND PAYMENT BONDS

A. The CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount equal to the Contract Price as security for the faithful performance and payment of the CONTRACTOR's obligations under the Contract Documents. The

Payment Bond shall remain in full force and effect throughout the entire performance of the Work, and within the timelines established under California law to allow a Claimant to assert a claim against the Payment Bond. The Performance Bond shall remain in full force and effect for a period until final completion and final acceptance of all work, or until the expiration of all Warranties as required by the Contract Documents, whichever period may be later. All Bonds shall be in the forms prescribed by law and by the Contract Documents and be executed by Sureties named in the current list of "Certified Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds or Certified Reinsurer Companies Holding Certificates Of Authority As Acceptable Reinsuring Companies" published in Circular 570 (most recent amendment) by the Audit Staff Bureau of Accounts, U.S. Treasury Department(www.fms.treas.gov/c570/index.html) and is admitted to issue bonds in the states in which the Project is located and all Work is performed. If the Surety is declared bankrupt or becomes insolvent or its right to do business is terminated by the state where the Work is located or if it ceases to meet the foregoing listing requirement, the CONTRACTOR shall provide another Bond acceptable to the DISTRICT meeting the stated requirements. All Bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

B. Sureties shall specifically waive all rights of notice of and consent to any and all changes, extensions of time, or modifications, deletions, alterations or additions to the terms of the Contract. The CONTRACTOR shall be solely responsible for notifying Sureties of all events that may affect them, and unless the Contract Documents provide otherwise, the DISTRICT bears no obligation to provide any such notification to Surety.

9. WARRANTY

A. CONTRACTOR warrants that all labor, materials and equipment furnished under the Contract Documents shall be warranted one year. The CONTRACTOR warrants that all materials and equipment is new unless otherwise specified in the Contract Documents; and that all Work conforms to the Contract Document requirements and is free of any defect whether performed by the CONTRACTOR or any subcontractor or supplier.

1. Unless otherwise stated in the Contract Documents, all warranty periods shall begin upon the filing of the Notice of Completion.

2. The CONTRACTOR shall remedy and correct, at its own expense, any damage to real or personal property caused by its work, or that of any subcontractor or supplier.

3. The CONTRACTOR shall furnish the DISTRICT with all warranty documents required pursuant to the Contract Documents as directed by the DISTRICT, and prior to Substantial Completion of the Project.

4. The DISTRICT shall notify the CONTRACTOR, in writing, within a reasonable time after the discovery of any failure, defect, or damage. CONTRACTOR shall within seven (7) calendar days after being notified commence and perform with due diligence all necessary Work to complete or correct the Work at issue. If the CONTRACTOR fails to promptly remedy any defect, or damage, the DISTRICT

may, in its sole discretion, exercise its right to replace, repair, or otherwise remedy the defect, or damage at the CONTRACTOR's expense. However, in the event of any emergency constituting an immediate hazard to health, safety, property, or licensees, when caused by Work of the CONTRACTOR not in accordance with the Contract Documents, the DISTRICT may undertake and the CONTRACTOR and his surety shall be liable to the DISTRICT for the cost thereof expense, and without prior notice, all actions necessary to correct such condition.

5. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for Work performed and Materials furnished under the Contract Documents, the CONTRACTOR shall:

   a. Obtain for the benefit of the DISTRICT all warranties that would be given in normal commercial practice and/or that are required pursuant to the Contract Documents;

   b. Require all warranties to be executed, in writing, for the benefit of the DISTRICT; and

   c. Enforce all warranties for the benefit of the DISTRICT, unless otherwise directed in writing by DISTRICT.

6. The warranty provisions under this Agreement shall in no way limit the DISTRICT's rights under the Contract Documents or otherwise under California law, including without limitation, with respect to patent or latent defects, gross negligence, or fraud. The DISTRICT specifically reserves all rights related to defective work, including but not limited to the defect claims pursuant to California Code of Civil Procedure Sections 337.1 or 337.15.

7. **Storage of Materials, Products, and Equipment.** CONTRACTOR shall provide proper storage facilities and exercise such measures, as may be reasonably required by the DISTRICT upon review of CONTRACTOR's storage measures, to ensure the preservation of the specified quality and fitness of materials, products and equipment to be used in the Work. Stored materials, products and equipment shall be located so as to provide reasonable access for observation by the DISTRICT. In case of suspension of the Work, CONTRACTOR shall store and protect materials and equipment as necessary to maintain the quality, integrity, and availability when performance of the Work is resumed. See Section 001600 for additional details.

10. CHANGES IN THE WORK

A. **Changes.** No modification, amendment, deviation, or change concerning the Contract Documents will be permitted by the CONTRACTOR without prior written consent of the DISTRICT. However, the DISTRICT, without invalidating the Agreement and with or without notification to the CONTRACTOR's sureties, may order changes in the Work or make changes by altering, adding to, or deducting from the Work, or changes to the Contract Documents to provide for additions, deletions, and revisions or to modify terms and conditions, including changes to the Work, the Contract Price, and/or the Contract Time. Modifications, amendments, deviations, or changes to the Contract

Documents may only be authorized by a written Change Order or Work Directive Change.

B. The CONTRACTOR expressly agrees that it shall not consider any order, instruction, Clarification, Response to a Request for Information or any other communication either written or oral given intentionally or unintentionally by the DISTRICT or any other person as authorization or direction to do work that would cause a change in Contract Time or Contract Price unless it is a Change Order or Work Directive Change signed by the DISTRICT.

C. **Requests for Quotation**. If a change involving Contract Price or Contract Time is being considered, the DISTRICT will issue a Request for Quotation describing the proposed change. The CONTRACTOR shall submit a quotation within ten (10) days of receipt of a Request for Quotation, or sooner if requested by the DISTRICT so as not to delay or interfere with the progress of the Work, and in accordance with the requirements for determining the cost of changes described in this Article.

D. **Change Orders.** If the DISTRICT and the CONTRACTOR agree on the change in Contract Price and Contract Time for a proposed change, a Change Order will be issued and signed by the CONTRACTOR and the DISTRICT. An executed Change Order shall be conclusive and constitute a final settlement of the change in Contract Time and Contract Price for the work covered by the Change Order, including, without limitation, the effect of the change on all other portions of the Work completed or not and shall include compensation for all related claims for disruption, impact, delay or extended overhead, if any, that may result from the change. Unless expressly reserved by the CONTRACTOR and agreed to by the DISTRICT, an executed Change Order shall also constitute a waiver by the CONTRACTOR (and its Subcontractors and suppliers, of every tier) of any Claims or potential Claims arising from or concerning all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change, any adjustments to the Contract Price, and any and all adjustments to the Contract Time. The CONTRACTOR acknowledges that explicitly included in every Change Order in accordance with this Article is a waiver of Section 1542 of the California Civil Code (as well as under any other state or federal statute or common law principle of similar effect) which provides as follows: “GENERAL RELEASE; EXTENT A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release and that, if known by him or her, must have materially affected his or her settlement with the debtor or released party.”

E. Any change or modification in the Work shall be performed under applicable provisions of the Contract Documents, and the CONTRACTOR shall proceed promptly, unless otherwise provided in the Change Order or Work Directive Change.

F. **Eliminated Items**. The DISTRICT reserves the right to eliminate any item of Work prior to the award of the Agreement without incurring any obligation to pay therefor. Should any item of the Work be eliminated in its entirety following the award of the Agreement and in the absence of an executed Change Order covering such elimination, payment will be made to the CONTRACTOR for reasonable costs actually incurred, and which are validated by the DISTRICT as being incurred, in connection with such eliminated item of Work but only to the extent that such reasonable costs

were incurred prior to the date of notification in writing by the DISTRICT of such elimination.

G. In the event that a change or modification in the Work results in a reduction of the amount of labor and material to be supplied by the CONTRACTOR, the DISTRICT shall be given a credit equal to the actual value of such labor and materials plus a reasonable amount for the use of tools, materials and reasonable overhead and profit as set forth below; or, in the event that a modification results in an increase in the amount of labor and materials to be supplied by the CONTRACTOR, the DISTRICT shall pay the CONTRACTOR the actual value of such labor materials and equipment plus reasonable overhead and profit as set forth below. Unless otherwise agreed to by the DISTRICT and the CONTRACTOR, or as may otherwise be directed by the DISTRICT, all costs shall be included as unit prices acceptable to the DISTRICT and the CONTRACTOR, lump sum prepared by the CONTRACTOR and found acceptable by the DISTRICT, or by cost accounting pursuant to a Work Directive Change in accordance with this Article.

H. In the event that the DISTRICT and the CONTRACTOR are unable to agree upon an increase or decrease to the Contract Price and/or modification to the Contract Time pursuant to any change or modification in the Work, the DISTRICT may, in addition to all other rights and remedies it has at law and pursuant to the Contract, take the following actions: (i) issue a written order to the CONTRACTOR to promptly proceed with the Work as directed by the DISTRICT pursuant to a Work Directive Change including, without limitation, on a cost accounting basis (e.g., force account) as set in this Agreement. Any claim by the CONTRACTOR for an increase in the Contract Price or an extension of the Contract Time shall be made in writing and in accordance with the provisions of this Agreement; or (ii) partially terminate the Contract for the items in question, and any such partial termination shall not be interpreted as a breach of contract and shall not give rise to any Claim on behalf of the CONTRACTOR for an adjustment in Contract Price, Contract Time, or both; or (iii) the DISTRICT may proceed to have the items in question performed by its own forces or by others, in its sole discretion.

I. **Work Directive Change**. To the extent the DISTRICT elects not to issue a Change Order for the performance of Work that the CONTRACTOR contends is changed or modified Work, or if the DISTRICT and the CONTRACTOR have not agreed on the change in Contract Price and/or Contract Time, if any, required for a proposed change, or if time constraints do not permit preparation of an appropriate quotation, the DISTRICT may, without invalidating the Agreement, order changes or modifications to the Work and direct the CONTRACTOR to proceed accordingly by issuing a Work Directive Change. The CONTRACTOR shall, promptly upon receipt of a Work Directive Change, perform the identified Work as directed, including pursuant to the force account procedures under this Agreement, in strict compliance with the Work Directive Change and the Contract Documents, as expeditiously and timely as possible, and shall submit a complete and specific Claim for any increase in Contract Price or adjustment of Contract Time, or both, within ten (10) calendar days after such Work is performed.

J. A Work Directive Change shall be used in the absence of total agreement on the terms of a Change Order, and shall be signed by the DISTRICT. If the Work Directive

Change provides for an adjustment to the Contract Price, the adjustment shall be based on one of the following methods at the sole discretion of the DISTRICT:

1. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

2. Unit prices stated in the Contract Documents or subsequently agreed upon;

3. Costs pursuant to the force account basis as set forth in this Agreement; or

4. Costs to be determined in a manner agreed upon by the DISTRICT and the CONTRACTOR and a mutually acceptable fixed or percentage fee, or as otherwise directed by the DISTRICT.

K. The amount of credit to be given to the DISTRICT for a deletion or change pursuant to a Work Directive Change that results in a net decrease in the Contract Price shall be based on actual net cost as confirmed by the DISTRICT and the CONTRACTOR's overhead and profit on such costs. When both additions and credits covering related work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

L. Pending final determination of the total cost of a Work Directive Change, the CONTRACTOR may request payment for the Work completed under the Work Directive Change through an appropriate Application(s) for Payment. The DISTRICT will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the recommended amount that the DISTRICT determines, in their professional judgment, to be reasonably justified, if any.

M. When the DISTRICT and the CONTRACTOR agree concerning the adjustments in the Contract Price and/or Contract Time, or both, the Work Directive Change shall be converted into a Change Order as promptly as reasonably possible. Change Orders may be issued for all or any part of a Work Directive Change. Failure of the CONTRACTOR to notify the DISTRICT in writing of any disagreement with any proposed adjustment to the Contract Price and/or Contract Time, or both, as applicable, or method for determining them as set forth in a Work Directive Change, within seven (7) days after the date of receipt by the CONTRACTOR of such Work Directive Change shall be deemed to be an agreement by the CONTRACTOR to the proposed adjustment to the Contract Price and/or Contract Time, or both, as applicable, or method for determining them as set forth in such Work Directive Change, and shall constitute a waiver by the CONTRACTOR of any Claims related thereto.

N. **Information, Interpretations and Minor Changes**. The DISTRICT has the authority to order minor changes in the Work, including interpretations which are consistent with the intent of the Contract Documents. If the CONTRACTOR considers that any minor changes so ordered causes a change in Contract Price or Contract Time, or both, the CONTRACTOR shall notify the DISTRICT in writing within ten (10) calendar days of receipt of the order.

O. If, after reviewing the CONTRACTOR's objection or response to a minor change, the DISTRICT determines the Work is required by the Contract Documents and does not

involve a change in Contract Price or Contract Time, the DISTRICT may direct the CONTRACTOR, in writing, to proceed with the work. If so directed, the CONTRACTOR shall promptly proceed with the work, and should the CONTRACTOR believe it is entitled to see a change in Contract Price or Contract Time, or both, the CONTRACTOR may assert a Claim in accordance with this Agreement, and shall document all costs in accordance with this Article.

P. **Determining Cost of Changes; Force Account.** The CONTRACTOR's quotations of cost on proposed changes and cost reported for work performed on a cost accounting basis (e.g., force account) shall be determined as the sum of the following:

1. Costs of labor including foremen engaged on the work but not of the Superintendent, field project manager, and other supervisory or support personnel except as provided in Article 11.P.5. Labor costs shall include the cost of social security, old age and unemployment insurance, fringe benefits required by labor agreements and workers' or workmen's compensation insurance;

2. Costs of materials, supplies and equipment, including cost of transportation, incorporated in the Work;

3. Rental costs for power tools and special or heavy equipment, except small tools and minor items of equipment, the CONTRACTOR will be paid in accordance with the current edition of “Labor Surcharge and Equipment Rental Rates” published by the State of California, Department of Transportation, Caltrans. No separate payment will be made for the use of small tools and minor items of equipment which cost shall be considered included in the overhead allowance. As used herein, small tools and minor items of equipment shall be individual tools or items of equipment having each a replacement value of $200 or less;

4. Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the change;

5. The increased or decreased cost of the CONTRACTOR's supervision and field office personnel but only if the change affects the “critical path” of construction activities and requires a change in Contract Time;

6. The reasonable cost of any tier of Subcontractors’ work computed as required for the CONTRACTOR’s work. The mark-up charged by all Subcontractors for overhead and profit shall be the lesser of: i) subject to negotiation, ii) as included in the original Bid for the Work, or iii) an amount not to exceed a cumulative total of 15% of the direct costs of all Work performed by Subcontractor, or by Subcontractor and its sub-subcontractors where multiple tiers of Subcontractors are involved in the performance of the Work, and

7. For the reasonable Work performed by the CONTRACTOR, the mark-up for overhead, profit and all other costs shall be the lesser of: i) subject to negotiation, ii) as included in the original bid for the Work and contained in escrowed bid documents, or iii) an amount not to exceed: (A) For work self-performed by the CONTRACTOR, a total amount of 15% of the direct costs of the changed work performed; or (B) For work performed by both the CONTRACTOR and its Subcontractors, of all tiers (where the CONTRACTOR and its Subcontractors, of

all tiers, participate in the performance of the changed work), a total amount of 20% of the direct costs of the changed work performed.

Q. **Limitations on Markup for Changes.** Where the CONTRACTOR self-performs a change in the Work, the maximum total amount of adjustment to the Contract Price for markup for overhead, profit, and all other costs shall not exceed fifteen percent (15%) of the direct costs of the changed work performed by the CONTRACTOR. Where the CONTRACTOR and its Subcontractors, of all tiers, participate in the performance of a change in the Work, the maximum total amount of adjustment to the Contract Price for markup for overhead, profit, and all other costs shall not exceed twenty percent (20%) of the direct costs of the changed work performed by the CONTRACTOR and its Subcontractors, of all tiers. Work shall be done making the most effective use of labor; materials shall be purchased at the lowest available price and all discounts shall be passed on to the DISTRICT; equipment shall be rented at the most favorable rate available for the term of use required.

R. When both additions and deletions are related and pertain to the same Work item and are included in the same Change Order or Work Directive Change, the markup for overhead and profit shall be computed on the net increase, if any.

S. The CONTRACTOR shall keep the DISTRICT informed as to when and where work is being performed on a cost accounting basis and shall submit complete auditable records of the cost of such work including daily time sheets signed daily by the DISTRICT.

T. **Contractor Maintenance of Daily Records for Changes**. In the event that the CONTRACTOR is directed to perform any changes to the Work, or should the CONTRACTOR encounter conditions which the CONTRACTOR believes would obligate the DISTRICT to adjust the Contract Price and/or the Contract Time, the CONTRACTOR shall maintain detailed records of the cost of such changes on a daily basis and a summary in a daily report supplemented by back-up records. Such records shall include without limitation hourly records for labor and construction equipment, itemized records of materials, including delivery tickets, and equipment used each day in connection with the performance of any change to the Work. In the event that more than one change to the Work is performed by the CONTRACTOR in a calendar day, the CONTRACTOR shall maintain separate records of labor, construction equipment, materials, and equipment for each such change. In the event that any Subcontractor of any tier shall provide or perform any portion of any change to the Work, the CONTRACTOR shall require that each such Subcontractor maintain records in accordance with this Article. Each daily record maintained hereunder shall be signed by the CONTRACTOR; such signature shall be deemed the CONTRACTOR's representation and warranty that all information contained therein is true, accurate, complete, and relates only to the change referenced therein. All records maintained by Subcontractors of any tier, relating to the costs of a change in the Work shall be signed by such Subcontractor's authorized Project Manager or Superintendent as a representation and warranty that all information contained therein is true, accurate, complete, and relates only to the change referenced therein.

U. **Submission of Daily Records.** All such records shall be delivered to the DISTRICT not later than on the day the Work is performed (same day) for independent verification. The DISTRICT shall attempt to review and reconcile costs of changes on a

daily basis. The DISTRICT's signature on the report shall indicate agreement with the information reflected therein, not that the CONTRACTOR is entitled to payment of the costs in the report. If the DISTRICT disagrees with the response, the DISTRICT shall note the areas of disagreement on the report. In the event that the CONTRACTOR shall fail or refuse, for any reason, to maintain or make available for inspection, review and/or reproduction such records, adjustments to the Contract Price or Contract Time, if any, on account of any change to the Work may be deemed waived for that day. The CONTRACTOR's obligation to maintain back-up records hereunder is a material inducement to and in addition to, and not in lieu of, any other CONTRACTOR obligation under the Contract Documents with respect to changes to the Work.

1. Labor. The daily report shall show the names, trade, labor, classifications, and hours worked, for the workers.

2. Material. The daily report shall describe and list quantities of materials used, attaching delivery tickets.

3. Equipment. The daily report shall show type of operation, including loading and transportation, if applicable.

4. Other Services and Expenditures. Other services and expenditures shall be described in such detail in the daily report as the DISTRICT may require.

5. Cost. The report shall provide dollar values for each category of cost.

V. Any work or changed work for which the CONTRACTOR may wish to make a Claim shall strictly comply with, and be done in accordance with this Agreement, including, without limitation, the cost accounting (e.g., force account) requirements set forth under this Agreement.

W. Change in Contract Time Due to Changes in the Work. If the Work required by a Change Order results in an extension of, or adversely affects, the Critical Path of construction tasks under the existing construction schedule and is the sole, unavoidable cause for an increase in the length of time required to complete the Work, the Contract Time will be adjusted accordingly subject to the CONTRACTOR's strict compliance with all requirements of the Contract Documents, including, without limitation Section 00800 - Special Provisions.

11. CLAIMS AND DISPUTE RESOLUTION PROCEDURES

A. **Notice of Potential Claim.** The CONTRACTOR is not entitled to additional compensation for any cause, including a disagreement, protest, or change, an act or failure to act by the DISTRICT, or the happening of an event, thing or occurrence, or an adjustment of Contract Price or Contract Time, unless the CONTRACTOR has given the DISTRICT written Notice of Potential Claim ("NOPC") as required under this Article.

1. The NOPC must clearly describe the nature, circumstances, and basis of the potential claim, and must explain the reasons that the CONTRACTOR believes additional compensation and/or time will or may be due, the nature of the costs

and/or time involved, the amount of the potential claim, a request for equitable adjustment, and written and verifiable documentation and support.

2. Except as otherwise required in the Contract Documents, the CONTRACTOR must promptly provide an NOPC to the DISTRICT upon discovery of concealed or unknown conditions or a disagreement, protest, situation, event, or occurrence that may result in a Claim. This notice must be submitted no more than 7 calendar days after the discovery or occurrence of an event that may be the basis for a Claim for an adjustment of the Contract Price or an extension of Contract Time, or both, or within any time limits specified elsewhere in the Contract Documents, whichever is shorter; failure to do so waives the CONTRACTOR's right to assert the Claim. Nothing set forth in this Section shall reduce, limit or waive any requirements set forth elsewhere in the Contract Documents, or by law, including without limitation as to the time and manner of any notice.

3. If costs or time cannot be reasonably determined at the time the NOPC is provided, the NOPC must be amended to include quantified cost and time impacts within 30 days after work has ceased on the event that prompted the NOPC; failure to do so waives the Claim in its entirety. For NOPC events that extend more than 30 days, the CONTRACTOR must provide a monthly accounting of ongoing costs and time impacts by the 5th day of the succeeding month; failure to do so waives the Claim.

B. **Duty to Mitigate Damages.** The CONTRACTOR is required to undertake all reasonable and practical efforts to mitigate the damaging effects of a potential current or future Claim it perceives as a result of an act or failure to act on the part of the DISTRICT, or as a result of an event, thing or occurrence. Written notice by the CONTRACTOR of a potential Claim does not excuse the CONTRACTOR from pursuing the mitigation of a Claim in good faith and with due diligence. Where possible, or if directed by the DISTRICT, the CONTRACTOR must be prepared to discuss various methods of mitigation with the DISTRICT prior to actual mitigation. The obligation to minimize foreseeable damages requires that the CONTRACTOR use reasonable care and diligence to prevent an unwarranted incurrence of damages from a delay caused by the other party or an unforeseen event. In evaluating a delay, if, in the opinion of the DISTRICT, the delay could have been avoided by due care of the CONTRACTOR, the CONTRACTOR is responsible for the additional costs attributed to the failure to mitigate.

C. The CONTRACTOR's Surety or Sureties shall be bound by any award or judgment rendered in any proceeding arising from the Project or undertaken in accordance with the Contract Documents. Further, the CONTRACTOR's Surety or Sureties shall be bound by and subject to the CONTRACTOR's Surety or Sureties shall, at the request of the DISTRICT (or the CONTRACTOR), participate in any dispute resolution proceedings, including mediation or litigation, that occur pursuant to the Contract Documents.

D. The DISTRICT and the CONTRACTOR intend that any disputes or differences between the DISTRICT and the CONTRACTOR arising under the Agreement or concerning the Contract Documents be brought to the attention of the DISTRICT at the earliest possible time in order that such matters may be addressed and/or settled, if

possible, or other appropriate action promptly taken. The DISTRICT and the CONTRACTOR agree to initially strive to resolve all disputes amicably and in an informal manner as provided for in the Contract Documents. If the resolution of any dispute involves a change in the Work, increase or decrease in the Contract Price, or adjustment in the Contract Time, then the informal dispute resolution shall be documented and confirmed by a Change Order pursuant to the Contract Documents. Informal discussions or negotiations with the DISTRICT or its representatives concerning informal resolution of a dispute shall not toll or suspend the times associated with pursing a Claim provided herein, unless so provided by the DISTRICT in writing.

E. The CONTRACTOR shall not be entitled to an increase in Contract Price, or adjustment of Contract Time, or both, for claimed extra work (or otherwise on account of any claim, cause, act, failure to act, or happening of any event or occurrence) unless the DISTRICT has issued a Change Order pursuant to the Contract Documents, or a Claim has been timely filed and approved pursuant to the Contract Documents. If the CONTRACTOR fails to timely file a written Claim in accordance with the Contract Documents, then the CONTRACTOR shall be deemed to have waived any right or remedy to thereafter pursue the Claim against the DISTRICT in any administrative, arbitration or litigation proceeding.

F. Claims. “Claim” or “Claims” means a separate written demand by the CONTRACTOR for one or more of the following:

1. An extension of Contract Time, including, without limitation, for relief from damages or penalties for delay assessed by the DISTRICT under the Contract for the Project;

2. Payment by the DISTRICT of money or damages arising from work done by, or on behalf of, the CONTRACTOR which shall result in an increase to the Contract Price, and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; and/or

3. Payment of any amount that is disputed by the DISTRICT.

G. **Requirements for Filing of Claim;** Contents; Filing Deadline. The CONTRACTOR may file a Claim with the DISTRICT. A Claim must (a) be in writing; (b) be labeled or clearly indicated as a Claim under the Agreement; (c) set forth in detail the reasons why the CONTRACTOR believes an adjustment to the Contract Price and/or Contract Time is or may be due, the nature of the costs and time issues involved, and, insofar as possible, the total amount of the Claim; (d) include (or reference earlier provided) documents that support and substantiate the Claim, including, without limitation complete documented costs of doing the Work for which it is making a Claim submitted in accordance with the requirements of the Contract Documents; and (e) include the following certification, properly completed and executed by CONTRACTOR or any officer of CONTRACTOR:

I, _____, BEING THE _____ (must be a project manager or officer) OF _____(CONTRACTOR), DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA, AND I DO PERSONALLY CERTIFY AND ATTEST THAT: I HAVE

THOROUGHY REVIEWED THE ATTACHED CLAIM FOR ADDITIONAL COMPENSATION AND/OR EXTENSION OF TIME, AND KNOW ITS CONTENTS, AND SAID CLAIM IS TRUTHFUL AND ACCURATE; THAT THE AMOUNT AND/OR CONTRACT TIME EXTENSION REQUESTED ACCURATELY REFLECTS THE CONTRACT ADJUSTMENT FOR WHICH THE DISTRICT IS LIABLE; AND FURTHER, THAT I AM FAMILIAR WITH CALIFORNIA PENAL CODE SECTION 72 AND CALIFORNIA GOVERNMENT 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.

H. A Claim must be submitted to the DISTRICT within the following Claim filing deadlines: (a) if a deadline is set forth in the Contract Documents for filing of the particular Claim, then the Claim must be filed by the specified time; (b) if the Claim relates to extra, additional or unforeseen work for which the CONTRACTOR intends to demand an adjustment to the Contract Price or Contract Time, or both, written notice shall be given to the DISTRICT at least five (5) days prior to the time that the CONTRACTOR is to commence performance of the Work giving rise to the potential Claim, and the CONTRACTOR shall not proceed with that work until so directed by the DISTRICT; and (c) for all other Claims not included within (a) or (b), the Claim must be filed on or before ten (10) days after the date of the occurrence, event or circumstance giving rise to the Claim. In no event shall a Claim be filed later than the date of Final Payment. The failure of the CONTRACTOR to timely file its Claim shall result in the waiver of the Claim in its entirety.

I. **Claims Subject to Public Contract Code Section 9204; Procedures.** This Section applies solely to the handling and resolution of a Claim(s) sent to the DISTRICT by registered mail or certified mail with return receipt requested in accordance with Public Contract Code section 9204(c)(1).

1. With respect to any Claim(s) sent to the DISTRICT in accordance with this Agreement, the provisions of Public Contract Code section 9204 shall apply

2. In the event mediation, if any, is unsuccessful pursuant to Public Contract Code section 9204, and all or parts of the Claim(s) remain in dispute, then the CONTRACTOR shall thereafter comply with the Claim procedures as set forth, in this Agreement, as applicable.

J. **Claims Equal to or Less than $375,000; Procedures.** This applies solely to the handling and resolution of a Contract Claim(s) that is/are in an amount equal to or less than Three Hundred Seventy-Five Thousand Dollars ($375,000).

1. With respect to any Claim(s) subject to this section, the provisions of Public Contract Code Section 20104, et seq. shall apply.

2. Agreement to Opt-Out. Notwithstanding anything to the contrary in the Contract Documents, the DISTRICT and the CONTRACTOR may mutually agree at any time, in writing, that any Claim(s) to which the obligations set forth in this Section apply (i.e., unresolved Claims in an amount equal to or less than $375,000) shall be subject to the dispute resolution requirements as set forth below applicable to the resolution and handling of claims in an amount in excess of $375,000.

K. **Claims Exceeding $375,000; Procedure**. This applies solely to the handling and resolution of a Claim(s) that is/are in an amount exceeding Three Hundred Seventy-Five Thousand Dollars ($375,000). With respect to any Claim(s) subject to this Part, the following shall apply:

1. The DISTRICT shall review facts pertinent to the Claim and request any additional information from the CONTRACTOR deemed necessary for a decision, if any. The CONTRACTOR shall promptly respond to any such request and provide any additional information as requested by the DISTRICT. The DISTRICT shall render a written decision on the Claim within sixty (60) days of receipt of the Claim and any additional information, unless the DISTRICT advises the CONTRACTOR in writing that additional time is required to evaluate the Claim, which shall constitute the Final Claim Determination.

2. If the CONTRACTOR disputes the Final Claim Determination of the DISTRICT, or if the DISTRICT fails to respond within the time prescribed, the CONTRACTOR may so notify the DISTRICT, in writing, either within fifteen (15) days of receipt of the written decision or the DISTRICT'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 DISTRICT shall schedule a meet and confer conference within thirty (30) days for the purpose of discussing settlement of the Claim.

3. Submission of a Claim, in conformance with all the requirements of the Contract Documents, and rejection of all or part of said Claim by the DISTRICT, is a condition precedent to any further action upon the Claim by the CONTRACTOR.

4. **Mediation.** The DISTRICT and the CONTRACTOR (and the CONTRACTOR's Surety or Sureties, or any Subcontractor, if requested to participate by the DISTRICT) agree to engage in good faith efforts to seek to resolve any outstanding Claims submitted pursuant to this Article by mediation prior to proceeding with, and as a condition precedent to, further dispute proceedings.

   a. **Initiation of Mediation.** Within ten (10) calendar days after the DISTRICT issues its Final Claim Determination pursuant to this Agreement, or the conclusion of any meet and confer conference pursuant to this Agreement, either party may initiate mediation of a Claim or dispute by notifying the other party, in writing, of its intent to mediate any Claims denied or rejected by the DISTRICT or otherwise in dispute. The CONTRACTOR hereby expressly waives all Claims not timely submitted to mediation.

   b. **Request for Mediation**. A request for mediation must be in writing and set forth a brief statement that identifies the Claim, the asserted damages, the names, addresses, and contact information of the parties, and identify their authorized representative, if any, that will participate in the mediation.

   c. **Selection of Mediator.** Upon receipt of a request for mediation, within fourteen (14) calendar days, the parties will meet and confer to select an appropriate mediator agreeable to all parties. If the parties cannot agree on a mediator, they hereby agree to accept a mediator to be appointed by a

recognized alternative dispute resolution organization, such as the American Arbitration Association or JAMS. The parties agree that any neutral selected or appointed to preside over the mediation shall be an attorney admitted to practice law in the State of California or a retired judge, and he or she shall possess at least 10 years' experience practicing law in the substantive areas of public contracting, public construction contracts and construction litigation.

d. **Time and Place of Mediation.** The mediator, using advice and input from the parties, shall set the time of each mediation session, as well as the mediation protocol (i.e., submission of briefs, statement of damages, etc.). The mediation will be held at any convenient location agreeable to the mediator and the parties, as the mediator determines. All reasonable efforts will be made by the parties and the mediator to schedule the first session within thirty (30) calendar days after selection of the mediator.

e. **Expenses.** All fees paid to the mediator, including any required traveling and other expenses of the mediator, will be shared equally among the parties to the mediation.

f. **Termination of Mediation.** The mediation may be terminated: (a) by the execution of a settlement agreement by the parties; (b) by a written declaration of the mediator to the effect that further efforts at mediation are no longer worthwhile; or (c) by a writing on behalf of a party or parties to the effect that the mediation proceedings are terminated. (g) Privileges and Protections: All meetings, communications and correspondence relative to the mediation procedures set forth in this Section shall be subject to any applicable mediation or settlement related privilege afforded under California law, including, without limitation, California Evidence Code Sections 1115, et seq., 1152 and 1154.

g. **Presentation of Statutory Claims; Litigation.** Nothing in this Part or the Contract Documents is intended nor shall be construed to change the time periods for filing tort claims or other actions specified by Chapter 1 (commencing with section 900) and Chapter 2 (commencing with section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code, nor otherwise effect the requirements of any other provisions of California law applicable to the presentation of Claims and prosecution of disputes by the CONTRACTOR. The CONTRACTOR shall be responsible to fully and timely satisfy all such requirements as may be applicable to any Claim presented by the CONTRACTOR in accordance with any applicable laws and regulations. Any litigation arising out of the Contract Documents shall be brought in the Nevada County Superior Court, and the CONTRACTOR, and its Surety(ies), expressly waive the removal provisions of California Code of Civil Procedure Section 394.

L. **Work Continues During Disputes**. In the event of any dispute between the DISTRICT and the CONTRACTOR, or during the pendency of any Claim(s) or associated proceedings under this Article or the Contract Documents, the CONTRACTOR shall not stop, or delay performance of, the Work, but shall prosecute the Work diligently to completion in the manner directed by the DISTRICT, unless otherwise directed in writing by the DISTRICT.

M. **Application.** The procedures and remedies set forth in this Article shall not apply to any claim by the DISTRICT against the CONTRACTOR or its Surety or Sureties, nor any right or obligation which the DISTRICT seeks to enforce against the CONTRACTOR (unless the DISTRICT, in its sole discretion, opts to proceed hereunder).

12. CONTRACT TIME AND DELAYS

A. Definitions of Terms:

1. "Excusable Delay" is any delay to the completion of the Project beyond the expiration of the Contract Time caused by conditions beyond the control and without any fault or negligence of the CONTRACTOR (or its Subcontractors or suppliers), such as strikes, embargoes, fire, unavoidable casualties, unusual delays in transportation, national emergency, and Unusual Weather. The financial inability of the CONTRACTOR or any subcontractor or supplier, and default of any subcontractor or supplier, without limitation, shall not be deemed conditions beyond the CONTRACTOR's control. The CONTRACTOR may make a Claim under this Agreement for an extension of Contract Time due to an Excusable Delay if it can show that the Excusable Delay is the sole and unavoidable cause increasing the Contract Time actually needed to complete the Work. The CONTRACTOR shall not be entitled to an increase in Contract Price due to an Excusable Delay.

2. "Compensable Delay" is any delay to the completion of the Project beyond the expiration of the Contract Time for which the DISTRICT is solely responsible due to its conduct or inaction (and not including delays arising from Excusable Delay) and which delay is unreasonable under the circumstances involved, and not within the contemplation of the parties, but shall not include any delay to the performance of the Work to the extent that the CONTRACTOR's performance is, was or would have been suspended, delayed or interrupted by another cause for which the CONTRACTOR (or its Subcontractors or suppliers) is/are solely or partially responsible (i.e., concurrent CONTRACTOR-caused delays). Subject to strict compliance with the terms and requirements of the Contract Documents, a Compensable Delay may entitle the CONTRACTOR to an extension of the Contract Time and/or an adjustment of the Contract Price. Except as provided for under the Contract Documents, and subject to Public Contract Code section 7102, the CONTRACTOR shall have no claim for damage or compensation for any delay, interruption, hindrance, or disruption. In the case of a delay which was caused in part by the CONTRACTOR and in part by the DISTRICT (Concurrent Delay), the CONTRACTOR shall only be entitled to an extension of the Contract Time and the CONTRACTOR shall not be liable for Liquidated Damages during the period of Concurrent Delay, but the CONTRACTOR shall not be entitled to any adjustment to the Contract Price whatsoever during the period of Concurrent Delay.

3. "Unusual Weather" is defined as the number of Wet Days exceeding the most recent published mean number of Wet Days for the construction period (e.g., for the same month) at the weather observing station closest to the project site as reported in "Comparative Climatic Data" published by the National Oceanic and

Atmospheric Administration, Ashville, NC 28801. “Wet Days” are defined as days that have at least 0.01 inch of rainfall.

B. **Computation of Time.** Any period of time referred to in the Contract Documents measured in days shall mean consecutive calendar days and shall exclude the first and include the last day. If the last day falls on a Saturday, Sunday or legal holiday, it shall be omitted from the calculation.

C. **Contract Time.** Time limits stated in the Agreement are the essence of the Contract. The CONTRACTOR confirms that the Contract Time is a reasonable period for performing the Work and includes enough float time to allow for normal unfavorable weather and other reasonably anticipated delays.

D. **Damages for Late Completion.** The CONTRACTOR shall complete all Work (inclusive of all interim milestones as defined in the Contract Documents), in strict accordance with the Contract Documents, and within the allocated Contract Time, subject to approved extension(s) of the Contract Time that may be granted by the DISTRICT, if any, during the course of the Project. In the event of a failure on part of the CONTRACTOR to achieve Final Completion within the allocated Contract Time, the CONTRACTOR shall pay to the DISTRICT Liquidated Damages in accordance with the Contract Documents. The DISTRICT reserves the right, in its sole discretion, to make a detailed written determination of the losses and damages incurred arising from the failure of the CONTRACTOR to achieve Final completion within the Contract Time, including any approved extensions, and to receive such full recompense from the CONTRACTOR.

E. **Commencing Work**. The CONTRACTOR shall not commence work (1) prior to the date in the Notice to Proceed; (2) prior to giving the DISTRICT five (5) days written notice; and (3) prior to the effective date of insurance coverage required under this Agreement, evidence of which shall be submitted to the DISTRICT prior to commencement of the Work.

F. **Delays**. Time is of the essence in the performance of this Agreement. The CONTRACTOR must complete the entire Work of the Project, and all designated portions thereof, within the Contract Time(s), subject to any authorized extension(s) thereof, pursuant to the Contract Documents. Failure of the CONTRACTOR to include an element of the Work required for performance of the Agreement in the current, updated construction schedule (or any earlier version of the construction schedule), or any inaccuracy in the construction schedule, does not relieve the CONTRACTOR from responsibility for accomplishing the Work within the Contract Times designated in the Contract Documents. The CONTRACTOR must provide an adequate workforce, materials of proper quality, and equipment to properly execute the Work and to ensure completion of each part of the Work in accordance with the Contract Documents and the construction schedule.

G. **Acceleration to Meet Construction Schedule.** The contractor shall proceed expeditiously with adequate forces and shall achieve Final Completion within the Contract Time. If the CONTRACTOR's performance falls behind schedule, the CONTRACTOR shall accelerate the Work, or a portion of the Work, as required to get back on schedule at no additional cost to the DISTRICT. Accelerated work shall include air or express delivery of materials and equipment, increasing the number of

workers, working overtime, working Saturdays, Sundays, and holidays (subject to the advance approval of the DISTRICT), and working additional shifts. The CONTRACTOR shall pay the DISTRICT for any extra cost of inspection made necessary by accelerated work required under this provision.

1. The DISTRICT reserves the right to direct the CONTRACTOR to accelerate performance of the Work, or any portion of the Work, or to work overtime when it is determined to be in the best interest of the DISTRICT or the Project. No action or direction of the DISTRICT other than an express written direction by the DISTRICT to accelerate performance of the Work or to work overtime shall be construed by the CONTRACTOR to be direction to accelerate the Work or to work overtime.

H. The DISTRICT will consider extensions to the Contract Times for the following reasons only if they are adequately demonstrated by the CONTRACTOR to affect the critical path of the construction schedule, as may be adjusted in accordance with the Contract Documents:

1. Delays in the progress of the Work due to Excusable Delay;

2. Delays in the progress of the Work due to a Compensable Delay or an act of neglect by the DISTRICT, but only for the amount of delay time that occurs after the CONTRACTOR has notified the DISTRICT in writing and the DISTRICT has had a reasonable time to respond to the notification; or

3. An Approved Change Order that extends the Contract Time.

I. Whenever the CONTRACTOR foresees any delay in the prosecution of the Work, the CONTRACTOR must notify the DISTRICT in writing of any potential delay or impact, including any anticipated impact on the Contract Price and/or Contract Time, or both. Within seven (7) calendar days from the beginning of any critical path delay to the construction schedule, or the occurrence(s) giving rise to the delay, whichever occurs earlier, the CONTRACTOR must provide written notice of the delay event to the DISTRICT. Said written notice shall include a description of the event or occurrence giving rise to the delay, the estimated duration of the delay, and the impact of the event or occurrence upon the critical path and Final Completion. The CONTRACTOR expressly waives any claim for delay or adjustment to the Contract Time and/or Contract Price if the CONTRACTOR fails to provide such written notice to the DISTRICT.

J. Within thirty (30) calendar days after the initial written notice of the CONTRACTOR, the CONTRACTOR shall submit all supporting information to the DISTRICT to validate the claimed impact of the delay on the Contract Time, including a Time Impact Analysis (“TIA”) in accordance with the requirements and provision set forth in Section 1310 – Construction Progress Schedule. If requested by the DISTRICT, the CONTRACTOR shall promptly, and no later than seven (7) calendar days after the DISTRICT’s request, provide updated or further supporting information, including an updated or revised TIA, with respect to the claimed delay or impact. The CONTRACTOR expressly waives any Claim for delay or adjustment to the Contract Time and/or Contract Price if the CONTRACTOR fails to promptly and timely provide

all supporting information, including the TIA and any additional/supplemental supporting information as may reasonably be requested by the DISTRICT.

K. The DISTRICT will ascertain the facts and the extent of the delay and adjust the Contract Times for completing the Work (and/or adjust the Contract Price) if, in the DISTRICT's sole discretion and judgment, the facts justify such an adjustment pursuant to the Contract Documents. The DISTRICT's written determination in this regard shall be considered final and conclusive. In the event CONTRACTOR disputes the DISTRICT's written determination, CONTRACTOR's sole and exclusive remedy shall be to pursue a Claim in strict accordance with the requirements of this Agreement.

L. The DISTRICT shall not consider any request for an adjustment to the Contract Time and/or Contract Price unless the CONTRACTOR satisfies the requirements set forth in the Contract Documents for providing prompt and timely written notice of the potential delay and submission of supporting information (including the TIA, and any further or additional supporting information as may be reasonably requested by the DISTRICT) establishing the impact of the delay on the critical path of the construction schedule. No adjustment of the Contract Time and/or Contract Price will be considered, or granted, as a consequence of any claimed delay event in the absence of the CONTRACTOR's strict compliance with the requirements of the Contract Documents.

M. The DISTRICT shall not be responsible to the CONTRACTOR for any constructive acceleration due to the CONTRACTOR's failure to comply with the submission and justification requirements of the Contract Documents for Contract Time and/or Contract Price adjustment requests. The CONTRACTOR's failure to perform in accordance with the construction schedule shall not be excused because the CONTRACTOR has submitted a request for adjustment of the Contract Time, unless and until the DISTRICT approves such request.

N. Unless the DISTRICT and the CONTRACTOR agree otherwise pursuant to a Change Order, in the event that the DISTRICT adjusts the Contract Time pursuant to a Compensable Delay, any request by the CONTRACTOR for delay costs (inclusive of all direct and indirect costs, expenses and overhead costs), if applicable, shall be limited solely to those costs identified in this Agreement. The CONTRACTOR shall neither claim nor recover any overhead costs in addition to those expressly allowed in this Agreement, nor shall the CONTRACTOR be entitled to claim or recover any "home office" expenses, "extended site overhead," or any other overhead cost on the basis of any "home office" damages formula, "Eichleay" formula, "Total Cost" recovery formula or any other such formula or calculation.

O. Adjustments in Contract Time associated with changes or modifications ordered through a Change Order by the DISTRICT are subject to the requirements under this Agreement. An executed Change Order covering changes or modifications ordered by the DISTRICT under this Agreement, or the resolution of Claims made under the Agreement, shall be the final and conclusive resolution of any adjustment to the Contract Time and/or Contract Price for the Work or Claim covered by the Change Order.

P. **No Early Completion Delay Damages.** While the CONTRACTOR may schedule completion of all the Work, or portions thereof, earlier than the Contract Time

established in the Agreement, the DISTRICT is exempt from liability for and the CONTRACTOR shall not be entitled to an adjustment of the Contract Price or to any additional costs, damages, or compensation whatsoever, for use of float or for the CONTRACTOR's inability to complete the Work earlier than the Contract Time established in the Agreement, for any reason whatsoever, including but not limited to, delay caused by the DISTRICT, or other delay event.

13. INSPECTION, DEFECTIVE WORK, WARRANTY

A. **Defective Work.** Defective Work is Work that, among other things: (1) is unsatisfactory, rejected, faulty, deficient, non-compliant, or leaks, breaks, fails or does not conform, whether generally or strictly, to the Contract Documents; or (2) does not meet the requirements of reference standards, tests or approvals specifically referred to in the Contract Documents; or (3) has been damaged prior to final acceptance; or (4) does not meet applicable industry or trade standards; or (5) a submittal is required and Favorable Review has not been obtained.

B. **Access to Work and Notice.** The CONTRACTOR shall provide the DISTRICT and its representatives safe access to every part of the Work at all times Work is in progress for observation, inspecting and testing. The CONTRACTOR shall give at least two (2) business days' notice of work being ready for required inspection, test or approval or of intent to cover work up.

C. **Tests and Inspections.** Unless otherwise specified, the CONTRACTOR shall arrange and pay for tests, inspections and approvals required by Laws and Regulations, ordinances, rules, and orders of public authorities having jurisdiction, or by the Contract Documents. All such tests, inspections and approvals shall be performed by an independent testing laboratory or inspection agency acceptable to the DISTRICT or to the appropriate public authority. Samples to be tested and items of work to be inspected will be selected by the DISTRICT or the public authority requiring the test or inspection. Test reports, inspection reports and certificates shall be submitted directly to the DISTRICT by the performing laboratory or agency. The CONTRACTOR shall notify the DISTRICT at least two (2) business days' prior to all tests and inspections to permit observation by the DISTRICT.

D. **Re-inspection.** If the DISTRICT determines that portion(s) of the Work require additional testing or retesting, the CONTRACTOR shall provide material to be tested, safe access to test locations, power, light and other services. The cost of retesting shall be paid for by the DISTRICT, but if the additional tests or retesting indicate that said portion of the Work is Defective, the CONTRACTOR shall pay the DISTRICT all costs associated with additional testing or retesting including the cost of the DISTRICT's additional service.

E. **Uncovering Work.** If work is covered or concealed without giving the DISTRICT at least two (2) business days' notice to permit observation, it shall be uncovered or exposed at the CONTRACTOR's expense to permit observation if so requested.

F. If the DISTRICT wishes to have work uncovered for observation after having been given the required notice to observe it, the CONTRACTOR shall uncover the work on a cost accounting (e.g., force account) basis in accordance with this Agreement. If the work is found to be in accordance with the Contract Documents, the DISTRICT shall

pay the cost of uncovering and replacing the work. If the Work is found to be Defective, the CONTRACTOR shall pay the cost of uncovering and correcting the work and the cost of required additional Project Management and testing service.

G. **Correction of Defective Work.** The CONTRACTOR shall promptly correct or remove and replace, to the satisfaction of the DISTRICT: (1) work rejected by the DISTRICT as being Defective, and (2) work that is Defective whether or not rejected by the DISTRICT. The CONTRACTOR shall correct Defective Work prior to installing subsequent related or connected Work. The CONTRACTOR's obligation to correct Defective Work applies to latent as well as patent defects and whether or not the work is fabricated, installed or completed and whether observed before or after Substantial Completion. The CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or replacement and removal (including but not limited to fees and charges of any consultants) made necessary thereby.

1. The fact that work and materials have been tested or inspected from time to time, and payments have been made, shall not relieve the CONTRACTOR from the responsibility of replacing and making good any defective work or materials that may be discovered before or after the date of completion of the Work by the CONTRACTOR and its approval and acceptance by the DISTRICT.

2. Failure of the DISTRICT to object to any defects in Work or material or variances from the Drawings and Specifications during or after construction shall not be deemed a waiver by the DISTRICT of such defects or variances; nor by such failure shall the DISTRICT be deemed stopped from requiring the CONTRACTOR to correct such defects or variances.

H. **Acceptance or Use of Defective Work.** The DISTRICT may elect to accept Defective Work in which case a deductive Change Order shall be signed by the CONTRACTOR reflecting the decreased value of the Work. If final payment has been made, the CONTRACTOR shall pay to the DISTRICT a sum reflecting the decreased value of the Work. The CONTRACTOR shall also bear all direct, indirect and consequential costs attributable to the DISTRICT's evaluation of and determination to accept such Defective Work (and which shall include, but not be limited to, fees and charges of Project Managers, architects, and other consultants).

1. The DISTRICT may use Defective Work without negating its rejection or decreasing the Warranty Period which shall commence when the work is finally corrected or replaced and accepted. When all or part of the Work is being used by the DISTRICT, the CONTRACTOR shall schedule correction or replacement of Defective Work at the DISTRICT's convenience.

I. **Correction of Defective Work by the DISTRICT.** Should the CONTRACTOR fail or refuse, after written notice from the DISTRICT to correct Defective Work, or to remove and replace rejected Defective Work as required by the DISTRICT, or when the CONTRACTOR fails to perform the Work in strict accordance with the Contract Documents, or when the CONTRACTOR fails to comply with any other provision of the Contract Documents, the DISTRICT may, at its sole option and after two (2) days written notice to the CONTRACTOR, correct and remedy any such Defective Work. No written notice shall be required from the DISTRICT in the event that the correction and

remediation of the Defective Work is required to immediately address an emergency situation, or to abate any risk to life, health or safety.

1. The DISTRICT's exercise of the rights and remedies under this Section shall be in addition to, and not in lieu of, any other rights and remedies available under the Contract Documents of applicable law.

2. All direct, indirect and consequential costs incurred by the DISTRICT in exercising such rights and remedies will be charged against the CONTRACTOR, and a Change Order will be issued adjusting the Contract Price. Such direct, indirect and consequential costs shall include, but not be limited to, fees and charges of any consultants, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the CONTRACTOR's defective work.

3. The CONTRACTOR shall not be allowed an extension of Contract Time because of any delay in performance of the Work attributable to the exercise by the DISTRICT of DISTRICT's rights and remedies under this Article.

J. **Warranty and Correction Period.** When within one year after the date of the DISTRICT's acceptance of the Work or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable warranty or special guarantee required by the Contract Documents or by any specific provisions of the Contract Documents, any Work is found to be Defective Work, the CONTRACTOR shall promptly, without cost to the DISTRICT and in accordance with written instructions given by the DISTRICT, either correct such defective work, or, when it has been rejected by the DISTRICT, remove it from the site and replace it with nondefective work. Acceptance of the Work by the DISTRICT or its representatives, shall in no way release the CONTRACTOR from its responsibility to comply with the provisions of the Contract Documents, even though deviations or Defective Work may not be discovered within the aforementioned one-year period. The one-year correction period set forth herein, and any and all guarantee or correction periods, does not in any way limit or waive the DISTRICT's rights to pursue legal action for patent or latent construction defects in accordance with California Code of Civil Procedure sections 337.1 and/or 337.15. Further, nothing contained in the Contract Documents shall be construed to limit in any manner the liability of the CONTRACTOR, or its Subcontractors and suppliers, or any tier, for damages sustained as a result of latent or patent defects in equipment or materials furnished or caused by the negligence of the CONTRACTOR or its subcontractors and suppliers, of any tier. The warranty contained in this Agreement, shall not be a waiver of nor shall they reduce any guarantee or warrantee offered by the suppliers of materials or equipment furnished under this Agreement nor shall they reduce any responsibilities imposed on manufacturers or suppliers of such equipment under applicable law.

K. Where the CONTRACTOR does not promptly and strictly comply with the terms of such written instructions given by the DISTRICT, or if the CONTRACTOR fails to comply with the requirements of any warranty or guarantee required by this Agreement within two (2) days after being notified in writing, or in an emergency where delay would cause serious risk of loss or damage, the DISTRICT may have the defective work corrected or the rejected work removed and replaced in accordance with this Section.

L. In special circumstances where a particular item of equipment is placed in continuous use and service before final acceptance of the Work by the DISTRICT, the correction period for that item may start to run from an earlier date when so provided in the Contract Documents, or if agreed to in writing by the DISTRICT.

M. In the event it is necessary for the DISTRICT to commence litigation to enforce any obligation or liability of the CONTRACTOR pursuant to this Section, the DISTRICT shall be entitled to recover from the CONTRACTOR, in addition to all other amounts found due and owing, fees of any consultants or experts necessary to address or correct the Defective Work.

14. PAYMENT

A. **Schedule of Values.** At least thirty (30) days prior to the first Application for Payment Date, the CONTRACTOR shall submit a Schedule of Values, in a form acceptable to the DISTRICT, allocating the Contract Price to various trades, types of work, pieces of equipment, and major tasks to assist the DISTRICT in evaluating the percentage completion for each part of the Work. The CONTRACTOR's overhead and profit shall be uniformly pro-rated over all items in the Schedule of Values. The Schedule of Values shall represent the actual cost of each segment of the work and shall not allocate higher costs, overhead or profit to work items scheduled for early completion. The total sum of the Schedule of Values shall equal the Contract Price. If the DISTRICT objects to the allocation of cost or the level of detail provided, the CONTRACTOR shall revise and resubmit the Schedule of Values. This Schedule of Values, unless objected to by the DISTRICT, shall be used only as a basis for the CONTRACTOR’s Applications for Payment. This Schedule of Values shall be so arranged that the value of the Work as it progresses may be readily determined.

B. **Application for Payment.** The period covered by each Application for Payment shall be one calendar month. Payment shall be based on work completed as of the Application for Payment Date which shall be the last day of the month unless otherwise stated in the Agreement. Within seven (7) days prior to each Application for Payment Date, the CONTRACTOR shall meet with the DISTRICT to review the line item amounts proposed by the CONTRACTOR for payment. When the amounts proposed are acceptable to the DISTRICT, the CONTRACTOR shall prepare and submit within three (3) days, an Application for Payment in a format acceptable to the DISTRICT, along with all required Conditional and Unconditional releases from the CONTRACTOR, each subcontractor, supplier and materialman whose work is included in the Application for Payment, and all other documentation (including, without limitation, certified payroll reports and information) that may be reasonably required by the DISTRICT. The CONTRACTOR shall sign and certify on the Application for Payment, subject to penalty of perjury, the following: “The undersigned CONTRACTOR certifies that to the best of the CONTRACTOR's knowledge, information and belief, the Work covered by this Application for Payment has been completed in accordance with the Contract Documents and that all Work for which previous payments have been received is free and clear of liens, claims, security interests or encumbrances of any kind. The CONTRACTOR further warrants that title to all Work covered by this Application for Payment will pass to the DISTRICT no later than the time of payment.”

1. As a condition precedent to payment by the DISTRICT, each itemized Application for Payment shall be accompanied by a current Conditional Waiver and Release On Progress Payment, in the form specified by the applicable California Civil Code, from CONTRACTOR and each of CONTRACTOR's subcontractors, suppliers, and union trust funds for which payment is sought by the Application for Payment, and an Unconditional Waiver and Release On Progress Payment, in the form specified by the applicable California Civil Code, from CONTRACTOR and each of CONTRACTOR's subcontractors, suppliers, and any union trust fund for which payment was sought by CONTRACTOR in the immediately preceding Application for Payment and for which the DISTRICT made payment.

2. The CONTRACTOR warrants that title to all work materials and equipment covered by an Application for Payment will pass to the DISTRICT, or its assignee, either by incorporation in the construction or upon receipt of payment by the CONTRACTOR, whichever occurs first, free and clear of all liens, stop notices, claims, security interest or encumbrances hereinafter referred to in this section as "liens". CONTRACTOR represents that no work, materials or equipment covered by an Application for Payment will have been acquired by the CONTRACTOR, or by any other person performing work at the Project or furnishing materials and equipment for the Project, subject to an agreement under which an interest or an encumbrance is retained by the seller or otherwise imposed by the CONTRACTOR or such other person.

3. **Taxes**. The CONTRACTOR shall pay all applicable sales, consumer, use, and similar taxes for the Work provided by the CONTRACTOR and such taxes shall be included in the Contract Price.

4. **Liability for Employee Payments.** CONTRACTOR accepts full liability and responsibility for the payment of any and all contributions, deductions, or taxes for social security, unemployment insurance, old age and survivor's benefits, medical and health benefits, or for any other purpose now or hereafter imposed under any applicable law measured by the wages, salary or other remuneration paid to persons employed by or on behalf of CONTRACTOR for the Work. CONTRACTOR covenants and agrees to observe and fully comply with all applicable law, including procurement of any necessary occupational licenses, permits and inspection certificates.

C. **Payment for Items Delivered But Not Installed**. Subject to the consent of the DISTRICT, Applications for Payment may include the percentage of value stipulated in the Agreement for major equipment and custom fabricated items that have been delivered, stored and adequately protected at the site of the Project, and CONTRACTOR acknowledges that payment of such amounts included in any Application for Payment is within the sole discretion of the DISTRICT. As express conditions precedent to payment for stored materials, CONTRACTOR shall provide all documentation required by the DISTRICT to confirm that title to such major equipment and/or custom fabricated items will pass to the DISTRICT upon payment which may include, without limitation, the following:

1. Certificates of insurance, evidence of transfer of title to the DISTRICT, and consent of surety to payment, for stored materials; and

2. Supporting documentation that verifies all amounts requested, such as paid invoices (overhead and profit on stored materials shall not be included in any Application for Payment). Payment will not be made for material stored at the site of the Project that is not custom fabricated. Payment will not be made for items stored off site. Payment will not be made for stored or installed items that are not protected from physical, environmental or other damage.

D. Within seven (7) days after receipt of the CONTRACTOR's Application for Payment, the DISTRICT will approve the application as submitted or will notify the CONTRACTOR of reasons for withholding a portion of the requested payment. The DISTRICT may withhold any payment in whole or in part to the extent necessary to reasonably protect the DISTRICT, or if it is unable to verify the accuracy of an Application for Payment. If the DISTRICT is unable to verify the accuracy of an Application for Payment, the DISTRICT will notify the CONTRACTOR in writing. If the CONTRACTOR and the DISTRICT cannot agree on a revised amount, the DISTRICT will promptly process payment for those amounts for which it is able to verify. The DISTRICT may also withhold any payment, or portion thereof, to protect the DISTRICT from loss because of known, or subsequently discovered, issues which may include, without limitation, the following:

1. Defective Work not corrected or remedied;

2. Third party claims filed or reasonable evidence indicating probable filing of such claims, including claims by separate contractors;

3. Failure of the CONTRACTOR to make payments properly or timely to subcontractors or suppliers for labor, materials or equipment;

4. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;

5. Damage to property, the Work, the DISTRICT, another contractor or a third party, including liquidated damages;

6. Reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

7. Work performed for which submittals are required prior to obtaining Favorable Review of submittals;

8. Failure to carry out the Work in accordance with the Contract Documents, including, without limitation, failure to make required submittals;

9. Failure to submit a construction schedule or to update the construction schedule in accordance with the Contract Documents;

10. Failure to update Record Drawings weekly;

11. Failure to provide all insurance coverages in accordance with the Contract Documents, or to reinstate required insurance coverage that has lapsed;

12. Non-payment of money owed to the DISTRICT for the extra cost of inspection;

13. Stop payment notice(s) served upon the DISTRICT;

14. Failure to submit certified weekly payrolls

15. Failure or refusal of CONTRACTOR to comply with the requirements and obligations of the Contract Documents; and

16. Any material breach of the Contract Documents by CONTRACTOR and/or its Subcontractors or suppliers, of any tier, or any other person or entity for which CONTRACTOR bears responsibility.

E. When the grounds for withholding any amount are removed to the satisfaction of the DISTRICT, in its sole discretion, payment shall be made by the DISTRICT for amounts withheld because of them within ten (10) Days' thereafter. Neither approval of an Application for Payment, delivery or making of a progress payment, nor partial or entire use or occupancy of the Project by the DISTRICT, shall constitute an acceptance of any Work not in accordance with the Contract Documents, nor shall it be deemed a waiver of the DISTRICT of any remedy it may have in law or equity. Should any stop payment notice be filed with the DISTRICT, the DISTRICT shall in accordance with California Civil Code Section 9358, withhold the amount claimed, plus an allowance of an additional 25% to cover its litigation costs plus interest at the rate of 10%, from progress payments until such claims have been resolved pursuant to law.

F. **Retainage.** Absent an express finding pursuant to Public Contract Code section 7201(b) authorizing the DISTRICT to withhold a higher amount of retention (in excess of five percent (5%) of the estimated value of the work done and the labor, materials, equipment, and services provided), the DISTRICT shall retain an amount from each progress payment not to exceed five percent (5%) of the estimated value of the work done and the labor, materials, equipment, and services provided, all in accordance with Public Contract Code section 7201. This retained amount shall be retained by the DISTRICT until the time of final acceptance of the Work and released in accordance with requirements of the Contract Documents and applicable law. In lieu of the five percent (5%) retainage, the CONTRACTOR may substitute securities as provided for in Public Contract Code Section 22300 and the Contract Documents.

G. Payments to the CONTRACTOR will be made within the time limits required under applicable law after submission to the DISTRICT of an appropriate Application for Payment, inclusive of all required documentation to substantiate the Application for Payment, and subject to the DISTRICT's regular approval and accounting procedures.

H. CONTRACTOR, and its subcontractors, shall promptly pay any subcontractor not later than seven (7) calendar days of receipt of each progress payment in accordance with the provision in section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The CONTRACTOR shall, by an appropriate written subcontract with each Subcontractor, require each Subcontractor to make payments to their sub-subcontractors in similar manner.

I. **Final Payment.** Thirty five (35) days after the acceptance of the Work by the DISTRICT and recordation by the DISTRICT of a Notice of Completion with the County Recorder, and upon CONTRACTOR providing to the DISTRICT all documents and information required by the Contract Documents including, without limitation, all releases, maintenance guarantees, maintenance manuals and technical specifications, and all other requirements for project completion and closeout as set forth in the Contract Documents having been fully and completely satisfied, the CONTRACTOR shall be entitled to the balance due for the completion and acceptance of the Work, provided that all claims for labor and materials have been paid, and that no Claims shall have been filed with the DISTRICT based upon acts or omissions of the CONTRACTOR and that no stop payment notices have been filed, less sums withheld for liquidated damages, if any, or any other damages incurred by the DISTRICT, or other sums withheld pursuant to the terms of the Contract Documents or as authorized by California law.

1. Final payment will be made in accordance with the Contract Documents and California law, including, without limitation, Public Contract Code Section 7107. Pursuant to Public Contract Code Section 7107, in the event of a dispute between the DISTRICT and CONTRACTOR, the DISTRICT may withhold from the final payment an amount not to exceed 150 percent of the disputed amount. All provisions of the Contract Documents, including without limitation those establishing obligations and procedures, shall remain in full force and effect notwithstanding the making or acceptance of final payment.

J. Waiver of Claims. Subject to the terms of the Contract Documents, the acceptance of final payment shall, after the date of Substantial Completion of the Project, constitute a waiver of all Claims by the CONTRACTOR.

K. The making of final payment shall not constitute a waiver of any claims or rights by the DISTRICT.

15. TERMINATION

A. **Termination by the DISTRICT for Cause (Default).** If the CONTRACTOR refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will ensure its completion within the time specified within the Contract Documents, including any authorized extension thereof; or abandons the Work; or fails to perform the Work, in any manner, as required by the Contract Documents and/or industry standards; or fails to retain a valid Contractor's license of the classification required for the Work; or fails to complete such work within such time as required under the Contract Documents; or seeks to assign the Contract; or, if the CONTRACTOR should be adjudged as bankrupt, or is otherwise deemed insolvent by the DISTRICT based on good cause and is unable to proceed with the Work; or if the CONTRACTOR should make a general assignment for the benefit of creditors; or if a receiver should be appointed on account of insolvency; or if the CONTRACTOR files a petition to take advantage of any debtor's act; or should any Subcontractor materially violate any of the provisions of the Contract Documents; or if the CONTRACTOR should persistently or repeatedly refuse or fail to provide the required project management, supervision, quality control, and/or supply enough properly skilled workers or proper materials to complete the Work in the time specified; or if the CONTRACTOR should fail to make

prompt payment to Subcontractors or suppliers for material or labor; or if the CONTRACTOR should persistently disregard laws or instructions given by the DISTRICT; or if the CONTRACTOR otherwise substantially fails to fulfill its obligations under, or commits a material breach of, or violates, the Contract Documents or any provision or term thereof; the CONTRACTOR shall be default under the Contract Documents. In such instance, the DISTRICT may, in its sole discretion, after providing the CONTRACTOR seven (7) Days' written notice, and without prejudice to any other remedy the DISTRICT may have:

B. Provide any such labor, equipment, equipment and/or services required to perform the Work or designated portion of the Work or to correct any deficiencies or delays and deduct the cost from any money due or to become due to the CONTRACTOR, or if the money due or to become due to the CONTRACTOR is not sufficient to cover such amount, the CONTRACTOR shall pay the difference immediately to the DISTRICT upon demand; or

C. Terminate the Contract, in its entirety or in part, effective immediately upon the DISTRICT's delivery to the CONTRACTOR and its Surety(ies) of a notice of termination of the Contract.

D. Upon receipt of the notice of termination of the Agreement for default, the Surety shall immediately takeover and assume the control of and perform the Work as the successor to the CONTRACTOR and shall immediately assume all rights obligations and liabilities, including Liquidated Damages, that have accrued under the Agreement. The Surety shall maintain the site of the Project and all of its safety controls. If the Surety fails to maintain the site of the Project, the DISTRICT may correct unsafe conditions and charge the Surety for costs incurred. If the Surety assumes the CONTRACTOR's terminated Work, it shall take the CONTRACTOR's place in all respects for that part and shall be paid by the DISTRICT for all work performed by it in accordance with the terms of the Contract Documents. If the Surety assumes the entire Agreement, all money due the CONTRACTOR at the time of its default, if any, shall be payable to the Surety as the work progresses, subject to the terms of the Contract Documents and any applicable bond, less all amounts due to the DISTRICT.

1. Within seven (7) days of its receipt of the notice of termination of the Agreement for default, the Surety shall provide to the DISTRICT a written plan detailing the course of action it intends to take to remedy the default of the CONTRACTOR. The DISTRICT will review and notify the Surety if the plan is satisfactory.

2. If the Surety fails to submit a satisfactory plan or to maintain progress on the plan as accepted by the DISTRICT, or does not otherwise comply fully and completely to the DISTRICT's satisfaction with the terms of the bond and within the time periods stated therein, the DISTRICT may, in its sole discretion, take over the Work and prosecute the same to completion by contractor by any other method it may deem advisable for the account and at the expense of the CONTRACTOR. The Surety and CONTRACTOR shall be liable to the DISTRICT for any excess cost and all other damages and costs incurred by the DISTRICT thereby or to which the DISTRICT is entitled under the Contract Documents or by law, and shall pay the DISTRICT all such amounts within thirty (30) days after the DISTRICT submits an invoice for such amounts. In such an event, the DISTRICT may without liability for so doing, take possession of and utilize such materials,

tools, equipment, supplies and other property belonging to the CONTRACTOR and/or assume assignment of any and all subcontracts for Subcontractors and/or suppliers that may be necessary to complete the Work. For any portion of such Work that the DISTRICT elects to complete by furnishing its own employees, materials, tools, and equipment, the CONTRACTOR and Surety shall compensate the DISTRICT for all costs related thereto. If requested by the DISTRICT, the CONTRACTOR shall demobilize, and shall remove any part or all of the CONTRACTOR's materials, supplies, equipment, tools, and construction equipment and machinery, from the Project site within 7 Days of such request; and if the CONTRACTOR fails to do so, the DISTRICT may remove or store, and after ninety (90) days sell, any of the same at the CONTRACTOR's expense.

3. If a termination for default is asserted by the DISTRICT, and demand made upon Surety by the DISTRICT, Surety shall not tender the CONTRACTOR, or any affiliate thereof, as its completion contractor except as authorized in the bond and subject to the sole discretion of the DISTRICT.

E. The CONTRACTOR hereby consents to assigning to the DISTRICT and/or the DISTRICT's replacement contractor all subcontracts and other agreements of any and all Subcontractors and/or suppliers that may be necessary to complete the Work in the event of a termination for default (or termination for convenience, as set forth below). The CONTRACTOR agrees to obtain, by way of a subcontract provision, the consent of each and every Subcontractor and/or supplier for such assignment prior to the commencement of each such Subcontractor's and/or supplier's conduct of the Work.

F. In the event of such termination for default, the CONTRACTOR will not be entitled to receive any further payment until the entire Work or disputed portion of the Work is completed and accepted by the DISTRICT. Any amounts due to the CONTRACTOR will be based on unit prices or lump sum bid and the quantity of work completed at the time of termination, less damages caused by acts of the CONTRACTOR, including but not limited to, all costs to complete the Work, all costs arising from professional services and attorneys' fees, and all costs incurred to insure or bond the work performed by any completion contractor and Subcontractors utilized to complete the Work. If such costs due to the DISTRICT on behalf of the CONTRACTOR exceed the unpaid balance, the CONTRACTOR or Surety shall pay the difference to the DISTRICT promptly upon demand. On failure of the CONTRACTOR to pay, the Surety shall pay all such amounts on demand by the DISTRICT. Nothing set forth herein shall limit Surety's obligations under the subject bonds or the timing thereof, which shall arise immediately upon the CONTRACTOR's default.

G. The CONTRACTOR and the DISTRICT agree that nothing in this Section is intended to create a right of either party to recover attorney fees as prevailing party in any lawsuit on this Contract.

H. In addition to all of its rights and remedies stated herein and under the Contract Documents and by law, the DISTRICT may also order the CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the DISTRICT to stop the Work shall not give rise to any duty on the part of the DISTRICT to exercise this right for the benefit of the CONTRACTOR or any other person or entity.

I. All obligations of the CONTRACTOR pursuant to the Contract Documents shall survive the termination for cause of the Agreement. The provisions of this Section are in addition to, and not in limitation of, any other rights or remedies under law or in equity available to the DISTRICT.

J. If it is later determined that the DISTRICT's termination of the Agreement for default was wrongful, or the CONTRACTOR had an excusable reason for not performing, such as a fire, flood, or other event which was not the fault of or was beyond the control of the CONTRACTOR, the DISTRICT, after setting up a new performance schedule, may allow the CONTRACTOR to continue work, or treat the termination as a termination for convenience, and the rights and obligations of the DISTRICT and the CONTRACTOR shall be the same as if the termination had been issued for the convenience of the DISTRICT.

K. **Termination by the DISTRICT for Convenience.** The DISTRICT may terminate the CONTRACTOR's performance under the Agreement for convenience, either in whole or in part, at its sole discretion for any reason, or when conditions encountered during the performance of the Work make it impossible or impracticable to proceed, or when the DISTRICT is prevented from proceeding with the Agreement by act of God, by law, or by official action of a public authority, or upon a determination that such termination is in the best interest and convenience of the DISTRICT, or whenever the DISTRICT is prohibited from completing the Work for any reason.

L. Upon receipt of a written notice of termination for convenience, the CONTRACTOR shall:

1. Stop work as specified in the written notice;

2. Terminate all orders and subcontractors except as necessary to complete any portion of the Work that is not terminated;

3. If directed in writing by the DISTRICT to do so, assign all right, title and interest in subcontracts and materials in progress, in which case the DISTRICT will have the right at its discretion to settle, or pay any or all claims arising out of the termination of such Subcontractors, but in no event shall recovery by any Contractor include lost profits for uncompleted portions of the Work;

4. Deliver or otherwise make available to the DISTRICT all data, drawings, specifications, reports, estimates, summaries and such other information and material as may have been accumulated by the CONTRACTOR in performing the Work whether completed or in process;

5. Settle outstanding liabilities and claims with the approval of the DISTRICT;

6. Complete performance of such part of the Work as has not been terminated; and

7. Take such other actions as may be necessary, or as may be directed by the DISTRICT for the protection and preservation of the Work and/or property related to the Work.

M. Upon receipt of the DISTRICT's written notice of termination for convenience, the CONTRACTOR shall submit to the DISTRICT a request for final payment in accordance with the requirements of the Contract. Such request shall be submitted promptly, but no later than sixty (60) days from the effective date of the termination for convenience.

N. The final payment to the CONTRACTOR after a written termination for convenience shall be limited to the following amounts due and owing under the Contract at time of termination: (1) Any actual costs incurred by the CONTRACTOR for restocking charges; (2) The agreed upon price of protecting the Work in any manner, if any, as directed by the DISTRICT; and (3) The Contract Price allocable to the portion of the Work properly performed or goods supplied by the CONTRACTOR as of the date of termination, as determined in accordance with the Contract Documents, reduced by any sums previously paid to the CONTRACTOR.

1. The above payment shall be the sole and exclusive remedy to which the CONTRACTOR is entitled in the event of a termination for convenience of the Agreement; and the CONTRACTOR will not be entitled to any other compensation or damages and expressly waives same.

2. The CONTRACTOR shall not be entitled to payment for any work not performed, including, without limitation, overhead and profit on work not performed.

3. The DISTRICT shall have the right to withhold any portion or the whole of the final payment under this provision in the event there are any outstanding claims or rights asserted by the DISTRICT against the CONTRACTOR, or by any third party against the DISTRICT which arises out of the CONTRACTOR's Work.

a. All obligations of the CONTRACTOR pursuant to the Contract Documents shall survive the termination for convenience of the Contract.

b. The CONTRACTOR shall include this termination for convenience provision in all subcontracts and purchase orders of every tier, which shall be binding upon all Subcontractors and suppliers, of every tier.

c. **Suspension by the DISTRICT for Convenience**. The DISTRICT shall have the authority to suspend or delay the performance of the Work, in whole or in part, for such period for any reason as the DISTRICT may deem necessary. The CONTRACTOR must immediately comply with the DISTRICT’s written order to suspend or delay the Work. The suspended or delayed Work can only be resumed upon written direction of the DISTRICT. A suspension or delay of Work as set forth in this Section shall not relieve the CONTRACTOR of its responsibilities as set forth elsewhere in the Contract Documents

d. In the event the DISTRICT orders a suspension or delay of the performance of the Work or any portion thereof for any reason the CONTRACTOR shall perform, at an agreed-upon cost with the DISTRICT, all the work necessary to (i) preserve and protect the Work and related facilities and improvements from weather and other environmental conditions during the period of suspension, (ii) repair any damage to the Work and/or related facilities and

improvements occurring before, provide a safe, smooth, and unobstructed passageway through construction for use by public traffic and any other public use during the period of suspension. In the absence of an agreed-upon amount between the DISTRICT and the CONTRACTOR to perform such work, the CONTRACTOR shall proceed to perform as directed by the DISTRICT and the CONTRACTOR may seek an adjustment of the Contract Price, limited to the amount of its direct costs to perform such work, in accordance with this Agreement.

e. In addition to the suspension or delay of the performance of the Work, in the event the DISTRICT determines in the sole discretion of the DISTRICT that a situation exists where continuation of the Work would be illegal or endanger the health, safety or welfare of persons or property on or affected by the Work, the DISTRICT will have the right to order the CONTRACTOR in writing to delay or suspend the Work in whole or in part for a period of time equal to the period of time while such situation exists. Such order of the DISTRICT shall not otherwise modify or invalidate in any way any of the provisions or requirements of the Contract Documents, and, notwithstanding anything to the contrary in the Contract Documents, the CONTRACTOR shall not be entitled to any damages or compensation from the DISTRICT on account of such delay or suspension.

16. RIGHT TO AUDIT

A. **Maintenance, Inspection, and Audit of Records**. All books, account, reports, files, correspondence, data and other records relating to this Contract as described in this Article shall be maintained by the CONTRACTOR, its Subcontractors and material suppliers, and shall be subject at all reasonable times to review, inspection, and audit by the DISTRICT, and their agents, upon the request of the DISTRICT, in its sole discretion, and at all times during performance of the Work and for a period of five (5) years after Final Completion of the Work.

B. **Accounting System**. Contactor shall exercise such controls as may be necessary for proper financial management of the Work. Such accounting and control systems shall comply with prevailing custom and practice for similar projects, be satisfactory to the DISTRICT and shall include preservation of records for a period of five (5) years after Final Completion, or for such longer period as may be required by Laws and Regulations.

C. **Books and Records**. The CONTRACTOR shall keep, and shall require all Subcontractors and suppliers, of every tier, to keep, full and detailed books, records, information, materials and data, of every kind and character (hard copy, as well as computer readable data), that pertain to the performance of the Work or the Contract, and any matters, rights, duties or obligations relating to the Work or the Contract, including, without limitation, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, change orders, change order requests, estimates, field orders, schedules, diaries, logs, reports, shop drawings, samples, exemplars, drawings, specifications, invoices, delivery tickets, receipts, vouchers, canceled checks, memoranda; accounting records; job cost reports; job cost files (including complete documentation of negotiated settlements); back charges; general ledgers; documentation of cash and trade discounts earned; insurance rebates and dividends

and other documents relating in any way to any claims, charges or time extensions asserted by the CONTRACTOR of any of the subcontractors.

D. **Inspection and Copying**. The CONTRACTOR, its Subcontractors and suppliers shall allow the DISTRICT, and its authorized representative(s), auditors, attorneys and accountants, upon twenty-four (24) hour notice to the CONTRACTOR, full access to inspect and copy all such books and records identified in this Article at a location as designated by the DISTRICT.

E. **Noncompliance by the CONTRACTOR**. The CONTRACTOR's compliance with any audit requested pursuant to this Article shall be a condition precedent to maintenance of any judicial or extra-judicial action arising from the Contract Documents. In addition to and without limitation upon the DISTRICT's other rights and remedies for breach, including any other provisions for withholding as set forth in the Contract Documents, the DISTRICT shall have the right, exercised in its sole discretion, to withhold from any payment to the CONTRACTOR due under each current Application for Payment an additional sum of up to ten percent (10%) of the total amount set forth in such Application for Payment, until the CONTRACTOR and the subcontractors have complied with any outstanding and unsatisfied audit request by the DISTRICT under this Article. Upon compliance with this Article, any such monies withheld shall be released to the CONTRACTOR.

F. **Enforcement by the DISTRICT**. The CONTRACTOR agrees that any failure by the CONTRACTOR, or any Subcontractor or supplier, to provide access to books and records as required by this Article shall be specifically enforceable by issuance of a preliminary and/or permanent mandatory injunction by a court of competent jurisdiction based on affidavits submitted to such court and without the necessity of oral testimony, to compel the CONTRACTOR, Subcontractors or suppliers to permit access, inspection, audit and/or reproduction of such records or the require delivery of such records to the DISTRICT for inspection, audit and/or reproduction. The CONTRACTOR shall expressly incorporate and make the requirements of this Agreement applicable to and binding upon all subcontracts, of any tier, and purchase orders in excess of $25,000, at any tier. The CONTRACTOR shall also require that the audit provisions pursuant to this Agreement be included in all agreements, contracts or subcontracts in excess of $25,000 entered into by Subcontractors and suppliers, of any tier.

17. FAILURE TO ACT NOT A WAIVER OF RIGHTS

Except as expressly provided in the Contract Documents, no action or failure to act by the DISTRICT, shall constitute a waiver of any right afforded or duty imposed under the Contract Documents. No such action or failure to act shall constitute approval of or acquiescence in failure to perform in accordance with the Contract Documents.

18. RIGHTS AND REMEDIES

Duties, obligations, rights and remedies prescribed by the Contract Documents shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed by or available under law.

19. LAWS AND REGULATIONS

The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations relating to the Project. If the CONTRACTOR observes that the Drawings and Specifications are at variance therewith, they shall promptly notify the DISTRICT in writing, and any necessary changes shall be adjusted as provided in the Agreement for changes in the work. If the CONTRACTOR performs any work contrary to such laws, ordinances, rules and regulations, and without written notice to the DISTRICT, they shall bear all costs arising therefrom and shall not be paid by the DISTRICT for performing such work.

20. CUSTOMER RELATIONS

The CONTRACTOR agrees that its personnel and equipment shall at all times present a neat appearance; all work shall be done, all contacts with customers and all complaints handled with due regard for the DISTRICT's public relations. The CONTRACTOR agrees that complaints of any nature received from the public or from public authorities shall receive immediate attention. All complaints and any action taken by CONTRACTOR with respect to such complaints shall be reported to the DISTRICT.

21. NOTICES

Any and all notices or other matters required or permitted by this Agreement or by law to be served on, given to, or delivered to either party hereto by the other party to this Agreement shall be in writing and shall be deemed duly served, given, or delivered when personally delivered to the party to whom it is addressed or in lieu of such personal service, five (5) days after deposited in the United States mail, first-class postage paid, addressed to the DISTRICT at 11570 Donner Pass Road, Truckee, California 96161, or to the CONTRACTOR at _____.

Either party, the DISTRICT or the CONTRACTOR, may change its address for the purpose of this section by giving written notice of such change to the other party in the manner provided in this section.

22. ATTORNEYS', EXPERTS' AND CONSULTANTS' FEES

In the event of any litigation concerning any controversy, claim or dispute between the parties hereto, arising out of or relating to this Agreement or the breach hereof, or the interpretation hereof, the prevailing party shall be entitled to recover from the losing party reasonable expenses, attorneys' fees, experts' fees, and consultants' fees, and costs incurred therein or in the enforcement or collection of any judgment or award rendered therein.

23. CAPTIONS

The captions and headings of the different sections of this Agreement are inserted for convenience of reference only and are not to be taken as part of this Agreement or to control or affect the meaning, construction, or effect of the same.

24. NECESSARY ACTS

Each party to this Agreement agrees to perform any further acts and execute and deliver any further documents that may be reasonably necessary to carry out the provisions of this Agreement.

25. ASSIGNMENT

Neither party may assign this Agreement, or payments due under the Agreement, without the written consent of the other party.

26. GOVERNING LAW

This Agreement shall be construed in accordance with, and governed by, the laws of the State of California.

27. FORUM

This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Nevada, State of California, and governed by California law. By entering into this Agreement, the CONTRACTOR, on behalf of itself and its Surety(ies), consents and submits to the jurisdiction of Courts of the State of California, County of Nevada, over any action of law, suit in equity, and/or other proceeding that may arise out of the Contract Documents, and expressly waive the removal provisions of California Code of Civil Procedure Section 394.

28. SOLE AND ONLY AGREEMENT

This Agreement, including any exhibits attached hereto, constitutes the sole and only Agreement of the parties hereto relating to the Project and correctly sets forth the rights, duties and obligations of each to the other as of its date. Any prior agreements, promises, negotiations, or representations not expressly set forth in this Agreement are of no force and effect.

29. DISTRICT POWERS

Nothing herein contained shall be deemed to limit, restrict or modify any right, duty or obligation given, granted, or imposed upon the DISTRICT by the laws of the State of California now in effect, or hereafter adopted, nor to limit or restrict the power or authority of the DISTRICT.

30. SEVERABILITY

In the event that any part or provision of this Agreement is found to be illegal or unconstitutional by a court of competent jurisdiction, such findings shall not affect the remaining parts, portions, or provisions of this Agreement.

31. ASSIGNMENTS OF RIGHTS

The CONTRACTOR agrees to assign to the DISTRICT all rights, title, and interest in and to all causes of action it may have 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 Agreement and that such assignments shall be made and become effective at the time the DISTRICT tenders final payment to the CONTRACTOR, without further acknowledgement by the parties.

32. WORKMANSHIP

All work shall be done and completed in a thorough workmanlike manner notwithstanding any omission from these specifications or from the Drawings, and it shall be the duty of the CONTRACTOR to call the DISTRICT's attention to apparent errors or omissions and request instructions before proceeding with the work. The DISTRICT may, by appropriate instructions, correct errors, and omissions, which instructions shall be as binding upon the CONTRACTOR as though contained in the original Contract Documents

33. CHARACTER OF WORKPERSONS

Whenever, in the opinion of the DISTRICT, any superintendent, foreman, or workman employed by the CONTRACTOR or their subcontractors is disrespectful, intemperate, disorderly, or otherwise objectionable, they shall, at the written request of the DISTRICT, be removed and not again be employed on the worksite without the written consent of the DISTRICT.

34. CONDITION OF WORKSITE AND EQUIPMENT

A. The CONTRACTOR at all times shall keep the Project site free from debris such as waste, rubbish, and excess materials and equipment. The CONTRACTOR shall use equipment that is in good working order and remove inoperable equipment. CONTRACTOR shall not store debris under, in, or about the premises. Upon completion of Work, the CONTRACTOR shall remove temporary fencing, barricades, planking, construction toilet and similar temporary facilities from site. The CONTRACTOR shall also clean all buildings, asphalt and concrete areas to the degree necessary to remove oil, grease, fuel, or other stains caused by CONTRACTOR operations or equipment.

B. The CONTRACTOR shall fully clean up the Project site at the completion of the Work or such other time(s) as DISTRICT may reasonably request, in their sole discretion. If the CONTRACTOR fails to fully clean the Project site, at any time, to the satisfaction of the DISTRICT, the DISTRICT may do so and the cost of such clean up shall be back charged back to the CONTRACTOR.

35. CONTRACTOR'S REPRESENTATIVE AND EMERGENCIES

A. The CONTRACTOR shall, at all times during working hours, be represented in all matters pertaining to this project by one, and only one, fully competent and experienced general superintendent. Instructions and information given by the DISTRICT to the CONTRACTOR's superintendent on the work shall be considered as having been given to the CONTRACTOR. Before any work is done at the job site, the CONTRACTOR shall give written notice to the DISTRICT stating who the CONTRACTOR's superintendent will be, giving a telephone number at which they can always be reached day or evening. The DISTRICT shall be informed in writing prior to

any change. A statement naming more than one representative at a time to be in charge and depending upon which is present at the time will not be acceptable.

B. Emergencies may arise during the progress of the WORK which may require special effort or require extra shifts of workers to continue the WORK beyond normal working hours. The CONTRACTOR shall be prepared in case of such emergencies from whatever cause, to do all necessary work promptly.

36. WORK INVOLVING TRENCHING OR EXCAVATION

For any work which involves digging trenches or other excavations that extend deeper than four feet below the surface, the CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the DISTRICT, in writing, of any: (1) 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; (2) Subsurface or latent physical conditions at the site differing from those indicated; or (3) 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. The DISTRICT shall promptly investigate the conditions, and if it finds that the conditions do so materially differ, or do 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 shall issue a change order according the procedure described in this Agreement. In the event a dispute arises between the DISTRICT and the CONTRACTOR whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the cost of, or performance of any part of the work, the CONTRACTOR shall not be excused from any scheduled completion date provided by this Agreement, but shall proceed with all work to be performed under this Agreement. The CONTRACTOR shall retain any and all rights provided either by this contract or by law which pertain to resolution of disputes and protests between contracting parties.

37. RESPONSIBILITIES OF DISTRICT

A. The DISTRICT shall assume the responsibility, between the parties to this Agreement, 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 this Agreement, if such utilities are not identified by the DISTRICT in the drawings and specifications. The CONTRACTOR shall be compensated for the costs of locating such utility facilities, repairing damage not due to the failure of the CONTRACTOR to exercise reasonable care, removing or relocating such utility facilities not indicated in the drawings and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work, and 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 DISTRICT or the owner of the utility to provide for removal or relocation of such utility facilities.

B. Nothing herein shall be deemed to require the DISTRICT to indicate the presence of existing service laterals or appurtenances whenever 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 the

construction; provided, however, nothing herein shall relieve the DISTRICT from identifying main or trunklines in the drawings and specifications.

C. Nothing herein shall preclude the DISTRICT from pursuing any appropriate remedy against the utility for delays which are the responsibility of the utility. Nothing herein shall be construed to relieve the utility from any obligation as required whether by law or by contract to pay the cost of removal or relocation of existing utility facilities.

D. If the CONTRACTOR, while performing the Contract discovers utility facilities not identified by the DISTRICT in the Contract Drawings or Specifications, the CONTRACTOR shall immediately notify the DISTRICT and utility in writing.

E. The DISTRICT, where it is the owner, shall have the sole discretion to perform repairs or relocation work or permit the CONTRACTOR to do such repairs or relocation work at a reasonable price.

38. NECESSARY TIME

The CONTRACTOR agrees to devote the time necessary to perform the services set forth in this Agreement in an efficient and effective manner. The CONTRACTOR may represent, perform services for and be employed by additional individuals or entities, in the CONTRACTOR's sole discretion, as long as the performance of these extra-contractual services does not interfere with or present a conflict with the DISTRICT's business.

39. NO ASSIGNMNENT

No assignment by the CONTRACTOR of any rights under or interests in the Agreement will be binding on the DISTRICT without the advance written consent of the DISTRICT; and, specifically but without limitation, moneys that may become due and moneys 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 CONTRACTOR from any duty or responsibility under the Contract Documents.

40. BOUND TO CONTRACT DOCUMENTS

The CONTRACTOR binds itself, and its partners, successors, sureties, assigns, and legal representatives to the DISTRICT, its partners, successors, assigns, and legal representatives, in respect to all covenants, agreements, and obligations contained in the Contract Documents.

41. UNENFORCEABLE PROVISION

Any provision or part of the Contract Documents held to be void or unenforceable under any law or regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the DISTRICT and the CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

42. RULES AD REGULATIONS

The CONTRACTOR acknowledges that the Project is or may be subject to requirements and regulations issued on behalf of various governmental and/or regulatory bodies. The CONTRACTOR agrees, on behalf of itself and its subcontractors, of any tier, to fully and promptly comply with any and all requirements and regulations issued on behalf of such entities.

43. ENTIRE AGREEMENT

This Agreement, inclusive of all Contract Documents, represents the entire agreement of the Parties concerning the subject matter hereof, and supersedes all prior negotiations, representations, or agreements of the parties, whether written or oral, with respect to such subject matter.

44. SURVIVAL OF TERMS

Any indemnity, warranty or guarantee given by the CONTRACTOR to the DISTRICT under this Agreement shall survive the expiration or termination of the Agreement and shall be binding upon the CONTRACTOR and their subcontractors and suppliers until any action is barred according to terms in the Agreement or by the applicable statute of limitations or statute of repose. All obligations of the CONTRACTOR under this Contract shall survive the expiration or termination of this Contract.

TRUCKEE DONNER PUBLIC UTILITY DISTRICT

By: _____

Name: _____

Title: _____

(Seal)

Attest: _____

Name: _____

Title: _____

CONTRACTOR

By: _____

Name: _____

Title: _____

(Seal)

Attest: _____

Name: _____

Title: _____

END OF SECTION 00500

SECTION 00600 – PERFORMANCE BOND

This Construction Performance Bond ("Bond"), dated _____ is in the penal sum of _____, and is entered into by and between the parties listed below to ensure the faithful performance of the Construction Contract identified below. This Bond consists of this page and the Bond Terms and Conditions, Paragraphs 1 through 14, attached hereto. Any singular reference to _____ ("Contractor"), ("Surety"), the Truckee Donner Public Utility District ("DISTRICT") or other party shall be considered plural where applicable.

CONTRACTOR:	SURETY:
_____	_____
Name	Name
_____	_____
Address	Principal Place of Business and Address

Truckee Donner Public Utility District
11570 Donner Pass Road
Truckee, California 96161

Attn: Contract Administrator

CONSTRUCTION CONTRACT:
Sitzmark Hydropneumatic Pump Station Replacement

DATED_____, 2026,

in the amount of $_____.

IN WITNESS THEREOF, the above bounden parties have executed this instrument under their seals this _____ day of _____, 2026, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature:	Signature:
_____	_____
Name and Title:	Name and Title:
_____	_____
Address	Address

If CONTRACTOR is a partnership, all partners must execute BOND.

PERFORMANCE BOND TERMS AND CONDITIONS

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the DISTRICT for the complete and proper performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor completely and properly performs all of its obligations under the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond.

3. The Surety's obligation under this Bond shall arise after the DISTRICT has declared a Contractor Default under the Construction Contract pursuant to the terms of the Construction Contract. Upon declaring the Contractor in default, the DISTRICT shall agree to make the undisputed Balance of the Contract Sum available to the Surety for completion of the work on the Project under the Construction Contract.

4. When the DISTRICT has satisfied the conditions of Paragraph 3, the Surety shall promptly, and in no event later than seven (7) working days after receipt of any notice of default, and at the Surety’s sole expense, confirm in writing as to its election to take one of the following actions:

    A. Arrange for the Contractor, with consent of the DISTRICT, to perform and complete the Construction Contract (but the DISTRICT may withhold consent in its sole discretion (with or without cause), in which case the Surety must immediately elect option 4B, 4C or 4D, below), and that such performance shall commence within an additional thirty (30) calendar days; or

    B. Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors (other than the Contractor), and that such performance shall commence within an additional thirty (30) calendar days; or

    C. As promptly as reasonably possible, obtain bids from qualified, responsible contractors (other than the Contractor) acceptable to the DISTRICT for a contract for performance and completion of the Construction Contract, and, upon determination by the DISTRICT that the contractor selected with the DISTRICT’s concurrence is responsible, and subject to full compliance with all applicable laws as may be required (including, without limitation, any applicable competitive bidding and public contracting and procurement requirements pursuant to California and/or Federal laws, if applicable), arrange for a contract to be prepared for execution by the DISTRICT and the contractor selected with the DISTRICT's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract and subject to the consent of the DISTRICT; and, if the Surety's obligations defined in Paragraph 6 exceed the Balance of the Contract Sum, then the Surety shall pay to DISTRICT the amount of such excess; or

    D. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and subject to its investigation and consultation with the DISTRICT, determine in good faith the amount for which it may then be liable to the DISTRICT under Paragraph 6 for the performance and completion of the Construction Contract and, within ten (10) additional calendar days, tender payment therefor to the DISTRICT

with full explanation of the payment's calculation. If the DISTRICT accepts the Surety's tender under this paragraph 4(D), the Surety shall remain liable for future damages, then unknown or unliquidated, and including, without limitation, additional costs incurred to complete the Construction Contract and any unsatisfied liquidated damages, resulting from the Contractor Default. If the DISTRICT disputes the amount of Surety's tender under this paragraph 4(D), the DISTRICT may exercise all remedies available to it at law to enforce the Surety's liability under paragraph 6.

5. If the Surety does not proceed as provided in Paragraph 4, then the Surety shall be deemed to be in default on this Bond ten (10) calendar days after receipt of an additional written notice from the DISTRICT to the Surety demanding that the Surety perform its obligations under this Bond. At all times the DISTRICT shall be entitled to enforce any remedy available to the DISTRICT at law or under the Construction Contract including, without limitation, and by way of example only, rights to perform work, protect work, mitigate damages, or coordinate work with other consultants or contractors.

6. The Surety's monetary obligations under this Bond are commensurate with the obligations of the Contractor under the Construction Contract. The Surety's obligations shall include, but are not limited to:

   A. The responsibilities of the Contractor under the Construction Contract for completion of the Construction Contract and correction of defective, deficient and/or non-compliant work;

   B. The responsibilities of the Contractor under the Construction Contract to pay liquidated damages, and for damages for which no liquidated damages are specified in the Construction Contract, actual damages, and all damages caused by non-performance or lack of proper performance of the Construction Contract, including but not limited to, all valid and proper back charges, offsets, payments, indemnities, and/or other damages;

   C. Additional administrative, management, legal, design professional and delay costs resulting from the Contractor Default or resulting from the actions or failure to act of the Surety under Paragraph 4.

7. No right of action shall accrue on this Bond to any person or entity other than the DISTRICT or its heirs, executors, administrators, or successors.

8. The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way 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 Contract Documents or to the Project and the provisions of Section 2819 and 2845 of the California Civil Code. Without limiting the foregoing, such changes, extensions of time and alterations or additions shall include, but are not limited to, changes or alterations to the Contract Documents (including, without limitation, an increase in the Contract Price), extensions of Contract Time, or modifications of the time, terms, or conditions of payment to the Contractor. No extension of time, change, alteration, modification, deletion, or addition to the Contract Documents, or of the work required thereunder, shall release or exonerate Surety on this Bond or in any way affect the obligations of Surety on this Bond.

9. Any proceeding, legal or equitable, under this Bond shall be instituted in the Superior Court for the County of Nevada.

10. As a part of the obligation secured under this Bond, and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees and expert costs, incurred by the DISTRICT in successfully enforcing any obligation arising under this Bond, all to be taxed as costs and included in any judgment rendered.

11. Notice to the Surety, the DISTRICT or the Contractor shall be mailed or delivered to the address(es) shown on the signature page.

12. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted here from and provisions conforming to such statutory requirement shall be deemed incorporated herein.

13. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains, including any warranty and guarantee obligations. Nothing herein shall limit the DISTRICT's rights or the Contractor or Surety's obligations under the Contract Documents, law or equity, including, but not limited to, California Code of Civil Procedure Section 337.1 or 337.15.

14. Definitions:

    A. Balance of the Contract Sum: The total amount payable by the DISTRICT to the Contractor pursuant to the terms of the Construction Contract after all proper adjustments have been made under the Construction Contract, for example, deductions for progress payments made, and increases/decreases for approved modifications to the Construction Contract.

    B. Construction Contract: The Agreement between the DISTRICT and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

    C. Contractor Default: Material failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

NOTE TO SURETY:

The following form of acknowledgement should be used. If any other form of acknowledgement is used, there must be submitted a certified copy of unrevoked resolution of authority for the attorney-in-fact.

SURETY COMPANY ATTORNEY-IN-FACT

STATE OF CALIFORNIA)
COUNTY OF _____) ss.
)

On _____, before me, the undersigned, a Notary Public in and for the State, personally appeared _____, known to me to be the duly authorized Attorney-in-Fact of the corporate Surety named in the within instrument, known to me to be authorized to execute that instrument on behalf of said corporation, known to me to be the person whose name is subscribed to such instrument as the Attorney-in-Fact of said corporation, and acknowledged to me that he (she) subscribed the name of said corporation thereto as Surety, and his (her) own name as Attorney-in-Fact and that said corporation executed the same.

WITNESS MY HAND AND OFFICIAL SEAL:
(SEAL)

_____
Notary Public for the State of California.

Acknowledgement by Attorney-in-Fact must be attached.
Corporate seals of Principal and Surety must be attached.

(Place Seal Above or Enclose on Separate Paper if more space is required)

END OF SECTION 00600

SECTION 00610 – PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS that the Truckee Donner Public Utility District ("District"), by its order made on _____, 2026, has awarded to

_____, hereinafter designated as the "Principal," a contract for the construction of the public work of improvement known as the Sitzmark Hydropneumatic Pump Station Replacement.

NOW, THEREFORE, we the Principal and _____

("Surety"), are held and firmly bound unto the District in the penal sum of _____

_____ Dollars ($_____), lawful money of the United States of America for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his/her or its heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 9100 of the Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed by any such claimant, any prevailing wages due and penalties incurred pursuant to the California Labor Code or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the Contractor and their subcontractors pursuant to Section 18806 of the Revenue and Taxation Code with respect to such work and labor as required by Sections 9550 et seq. of the Civil Code of California, then said Surety will pay for the same, in or to an amount not exceeding the amount set forth herein, and also will pay in case suit is brought upon this bond, such reasonable attorney's fees, as shall be fixed by the court, awarded and taxed as in the above mentioned statutes provided.

AND, the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Contract Document accompanying the same shall in any wise affect its obligations on this bond, and Surety does hereby waive the provisions of California Civil Code Section 2819 concerning any such consent to change, extension of time, alteration or addition to the terms of the contract, or to the work, or to the Contract Documents, or notice of the same.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their

seals this _____ day of _____, 2026, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Attestation on next page.

ATTEST:

_____	_____
Principal Secretary	Principal
(SEAL)	By _____ (s)
	_____
_____	_____
Witness as to Principal	(Address)
_____	_____
(Address)	(Surety)

ATTEST:

_____	_____
(Witness to Surety)	(Attorney-in-Fact)
_____	_____
(Address)	(Address)

If CONTRACTOR is a partnership, all partners must execute BOND.

END OF SECTION 00610

SECTION 00800 – SPECIAL PROVISIONS

1. DEFINITIONS AND TERMS

These definitions are supplemental to those defined elsewhere in the Contract Documents. Whenever in the Contract Documents the following terms are used, the intent and meaning shall be interpreted as follows:

1.1 ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, drawings and specifications, by additions, deletions, clarifications or corrections.

1.2 AGREEMENT - The written contract between the DISTRICT and the CONTRACTOR covering the WORK to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

1.3 BID - The offer or Bid of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.4 BIDDER - Any person, firm or corporation submitting a Bid for the Work.

1.5 BONDS - Bid Bond, Performance Bond and Payment Bond and other instruments of security, furnished by the CONTRACTOR and its surety in accordance with the Contract Documents.

1.6 CALENDAR DAY - Any day shown on the calendar.

1.7 CHANGE ORDER - A document signed by the CONTRACTOR and the DISTRICT authorizing an addition, deletion or revision in the WORK and, if warranted, an adjustment in the Contract Price or the Contract Time, or terms and conditions of the Contract Documents, issued on or after the Effective Date of the Agreement.

1.8 CONTRACT DOCUMENTS - All items of the contract as defined in the Agreement.

1.9 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the Contract Document.

1.10 CONTRACT TIME - The number of calendar days stated in the contract documents for the completion of the WORK

1.11 DISTRICT – The Truckee Donner Public Utility District, along with its authorized agents and representatives, including but not limited to managers, Project Manager, inspectors, engineers and consultants.

1.12 DRAWINGS – The part of the Contract Documents which show the characteristics and scope of the work to be performed and which have been prepared or approved by the DISTRICT.

1.13 FIELD ORDER - A written order effecting a change in the Work not involving an adjustment in the Contract Price or an extension of the Contract Time, issued by the DISTRICT to the CONTRACTOR during construction.

1.14 INSPECTOR - An authorized representative of the DISTRICT assigned to make any or all inspections of the work performed by the CONTRACTOR.

1.15 LABORATORY - A laboratory qualified to perform tests specified herein or other special laboratory designated by the DISTRICT or selected by the CONTRACTOR and approved by the DISTRICT.

1.16 NOTICE OF AWARD - The written notice of the acceptance of the Bid from the DISTRICT to the successful Bidder.

1.17 NOTICE TO PROCEED - The written notice given by the DISTRICT to the CONTRACTOR fixing the date on which the Contract Time will commence to run and on which the CONTRACTOR shall start to perform the CONTRACTOR's obligations under the Contract Documents.

1.18 OTHER AGENCIES - Any legal entity of the State of California, or any utility district or company (county, town, electric company, telephone company, water district, sewer district, etc.) that has any interest or control in construction or construction inspection, or are performing other work within or adjacent to the Project area.

1.19 SHOP DRAWINGS – All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a Subcontractor, manufacturer, supplier, or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

1.20 SPECIFICATIONS – A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment construction systems, standards and workmanship; also referred to as the Technical Specifications.

1.21 STANDARD SPECIFICATIONS - Whenever reference is made to the "Standard Specifications" such reference shall be made to those certain specifications entitled "State of California, Department of Transportation, Standard Specifications," latest edition, certain portions of which are made a part hereof by specific reference thereto.

1.22 Whenever the following underlined terms are used in the Standard Specifications, or in any of the Contract Documents or instruments governed by the Standard Specifications, they shall be defined as follows:

State: The DISTRICT.

Public Works Building: Office of the DISTRICT.

Department of Public Works: The DISTRICT.

Director of Public Works: The DISTRICT.

State Highway Engineer: The DISTRICT.

Engineer: The Engineer retained by the DISTRICT or authorized representative of the DISTRICT, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

Laboratory: The established laboratory of the Materials and Research Department of the Department of Transportation of the State of California or laboratories authorized by the DISTRICT to test materials and work involved in the contract.

Reference is made to Section 1 of the Standard Specifications for other pertinent definitions.

1.23 SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with the CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

1.24 STANDARD PLANS - Whenever reference is made to the "Standard Plans" such reference shall be made to those certain plans entitled "State of California, Department of Transportation, Standard Plans," latest edition, certain portions of which are made a part hereof by specific reference thereto.

1.25 SUBSTANTIAL COMPLETION - That date as certified by the DISTRICT when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the project or specified part can be utilized for the purposes for which it is intended.

1.26 SUPPLIER - Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

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

1.28 WORKING DAY - Any calendar day, except as noted below on which weather or ground conditions do not prevent utilization of at least fifty percent of the usual daily man hours during regular working hours.

1.29 WORK PACKAGE - Information consisting of, but not limited to, cover sheet and map, instruction per work location, material summary, construction sketch and pole type(s) provided as part of a Work Package.

1.30 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted as described in Section 00500 - Agreement to the said party at his last given address, or delivered in person to said party or his authorized representative on the work.

2. INVESTIGATION OF SITE AND CONDITIONS

The CONTRACTOR's attention is directed to the possible existence of pole lines, power lines, pipe lines, buildings, structures, and other public or private improvements which may be within the limits of the work or adjacent thereto.

It shall be the responsibility of the CONTRACTOR to ascertain the exact location of all utility lines, surface or sub-surface installations or facilities, and no additional compensation will be paid because of any such installation or facilities encountered along the line of work, or for any delays caused by the location or replacement thereof. It shall be the responsibility of the CONTRACTOR to maintain all lines and utilities, and any other surface or sub-surface structure or installation of any nature that may be affected by the work. The CONTRACTOR is responsible for the protection of any loss of such utilities, facilities, or installations, and for any damage to any of the same, all of which such damage shall be repaired or replaced at the cost of the CONTRACTOR, and to the satisfaction of the DISTRICT of such facility or installation.

The CONTRACTOR shall be compensated for the costs of locating, repairing damage not due to failure of the CONTRACTOR to exercise reasonable care, and removing or relocating existing main or trunkline utility facilities located on the Project site that are not the subject of the Agreement, which are not indicated in the Drawings and Specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work. 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 DISTRICT or the owner of the utility to provide for removal or relocation of such utility facilities. If the CONTRACTOR, while performing the Agreement, discovers utility facilities not identified by the DISTRICT in the Drawings and Specifications, he or she shall immediately notify the DISTRICT and utility in writing. Where the DISTRICT is the owner of the facility, it shall have the sole discretion to perform repairs or relocation work or permit the CONTRACTOR to do such repairs or relocation as Extra Work.

3. SCHEDULES, REPORTS, AND RECORDS

A. The CONTRACTOR shall submit to the DISTRICT such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data where applicable as are required by the Contract Documents for the work to be performed.

B. Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which it propose to carry on the work, including dates at which they will start the various parts of the Work, and estimated date of completion of each part. The constructions schedule shall indicate the time of starting and completion of each major structure or phase of the Project and such intermediate phases as will serve for well-defined control points. It shall also indicate the anticipated date of receipt of major items of equipment, and all items of equipment receipt and installation of which is critical to the scheduled progress of the Project.

The construction schedule. When approved, shall not be changed without written consent of the DISTRICT. The CONTRACTOR shall assume the full responsibility for performing the Work in an orderly manner under the provisions of the Agreement.

If, in the opinion of the DISTRICT, the CONTRACTOR has fallen behind the approved progress schedule, the CONTRACTOR shall take such steps as may be required by the DISTRICT, including, but not limited to, increasing the number of personnel, shifts, and/or overtime operations, days of work, and/or the amount of construction equipment until such time as the work is back on schedule. They shall also submit for approval no later than the time of submittal of the next request for partial payment, such supplementary schedule or schedules as may be deemed necessary to demonstrate the manner in which the approved rate of progress will be regained, all without additional cost to the DISTRICT.

4. SHOP DRAWINGS

A. The CONTRACTOR shall provide shop drawings as may be necessary for the prosecution of the Work, and as required by the technical specifications. The DISTRICT shall promptly review all shop drawings. The DISTRICT's review of any shop drawing shall not release the CONTRACTOR from responsibility for deviations from the Contract Documents. The review of any shop drawings which substantially deviate from the requirements of the Contract Documents shall be evidenced by a Change Order.

B. When submitted for the DISTRICT's review, shop drawings shall bear the CONTRACTOR's certification that they have reviewed, checked, and approved the shop drawings and that they are in conformance with the requirements of the Contract Documents.

C. Portions of the Work requiring shop drawing or sample submittals shall not begin until the shop drawing or submission has been reviewed by the DISTRICT. A copy of each reviewed shop drawing and each reviewed sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the DISTRICT.

D. The CONTRACTOR is referred to Section 01300 – Contractor Submittals for more detail regarding submittal requirements.

5. MATERIALS, SERVICES AND FACILITIES

A. It is understood that, except as otherwise specifically stated in the Contract Documents, the CONTRACTOR shall provide and pay for all labor, tools, equipment, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the Work within the specified time.

B. Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.

C. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6. PATENTS

The CONTRACTOR shall pay all applicable royalties and license fees. They shall defend all suits or claims for infringement of any patent rights and save the DISTRICT harmless from loss on account thereof, except that the DISTRICT shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified.

However, if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, it shall be responsible for such loss unless he promptly gives such information to the DISTRICT.

7. MEASUREMENT AND PAYMENT

Payment will be made for work performed based on the unit price schedule on the Bid Form as determined by the DISTRICT. Full compensation for furnishing all labor, tools, equipment, and incidentals, and for doing all the work involved in complying with all of the requirements of the Contract Documents shall be considered as included in the unit prices on the Bid Form, and no additional compensation will be allowed therefor.

8. INSPECTION AND TESTING

When requested by the DISTRICT, the CONTRACTOR shall furnish a complete written statement of the origin, composition, and manufacture of any and all materials that are to be used in the Work.

All materials may be inspected, sampled and tested by the DISTRICT. The CONTRACTOR shall give sufficient advance notice of placing of order to permit tests to be performed before the materials are incorporated in the work and they shall afford such facilities as the DISTRICT may be required for collecting and making inspections. All samples shall be furnished by the CONTRACTOR without cost to the DISTRICT. The DISTRICT may waive sampling and resting if adequate information, properly certified, is available to indicate that materials comply with terms of the specifications.

The CONTRACTOR shall furnish the DISTRICT with every reasonable facility for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the Contract Documents. If the DISTRICT requests it, the CONTRACTOR at any time before acceptance of the Work shall remove of uncover such portions of the finished work as may be directed. After examination, the CONTRACTOR shall restore said portions of the work to the standards required by the Contract Documents. Should the Work thus exposed or examined prove acceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed, will be paid for as provided under Section 00500 - Agreement, but should the work so exposed or examined prove unacceptable the uncovering shall be at the CONTRACTOR's expense. Inspection, supervision or observation by the DISTRICT shall not be considered as direct control of the individual workmen and their work. The direct control shall be solely the responsibility of the CONTRACTOR's foreman and superintendent.

The inspection of the Work shall not relieve the CONTRACTOR of any of its obligation to fulfill the Agreement as herein provided, and unsuitable materials may be rejected

notwithstanding that such work and materials may have been previously overlooked and accepted or estimated for payment.

On all questions concerning the acceptability of materials, classifications or materials, execution of the Work, and the determination of costs, the decision of the DISTRICT shall be final and binding upon all parties.

The CONTRACTOR shall at all times maintain proper facilities and provide safe access to all parts of the Work, to the shops wherein the Work is in preparation and to all warehouses and storage yards wherein equipment and materials are stored for purposes of inspection by the DISTRICT.

Inspectors employed by the DISTRICT shall be authorized to inspect all work done and materials furnished. Such Inspection may extend to all or any part of the Work, and to the preparation, fabrication, or manufacture of the materials to be used. The Inspector is not authorized to alter or waive the provisions of the Contract Documents.

An inspector is placed on the Work to keep the DISTRICT informed as to the progress of the Work and the manner in which it is being done; also to call the CONTRACTOR's attention to any non-conformance with the Contract Documents. The Inspector will not be authorized to approve or accept any portion of the Work, to issues instructions contrary to the Contract Documents, or to act as foreman for the CONTRACTOR. The Inspector will have authority to reject defective material and to suspend any work that is being improperly performed, subject to the final decision of the DISTRICT.

The Inspector will exercise such additional authority only as may from time to time be delegated to them by the DISTRICT.

9. LIMITS OF CONTRACTOR'S OPERATIONS

The CONTRACTOR will confine its operations within the limitations of construction easements or limits as shown on the drawings. If the CONTRACTOR's operations result in damage to any privately owned facility outside the limitations of the construction easement, the CONTRACTOR shall, at its expense, repair such damage or indemnify the DISTRICT of the damaged property.

If the CONTRACTOR negotiates with property owners for use of land for construction operations outside the limits of the construction easements, it shall do so at its own risk and the DISTRICT will assume no liability for such use of private property. All agreements between the CONTRACTOR and private property owners shall be in writing and the DISTRICT will be furnished copies of such agreements.

Hauling vehicles transporting materials to and from the Project site either empty or loaded shall meet all the requirements and comply with all laws and regulations as would be required when traveling on a public street or highway for any other purpose.

It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of the Agreement to create the public or any member thereof a third party beneficiary hereunder, or to authorize anyone not a party to this Agreement to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Agreement.

10. CONTRACT TIMES, MILESTONES AND LIQUIDATED DAMAGES

The DISTRICT and the CONTRACTOR recognize that time is of the essence for the performance of the CONTRACTOR's obligations pursuant to this Agreement, and that the DISTRICT will suffer financial loss if the Work is not completed within the time specified in the Contract Documents, plus any extensions thereof. They also recognize that losses incurred by the DISTRICT for delay would be extremely difficult or impossible to calculate or ascertain. The DISTRICT and the CONTRACTOR recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the DISTRICT if the Work is not completed on time. Accordingly, instead of requiring any such proof, the DISTRICT and the CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), the CONTRACTOR shall pay the DISTRICT the amounts as indicated below for each Day that expires after the time specified for each milestone.

The DISTRICT shall have the right to deduct the liquidated damages from any money in its hands, otherwise due, or to become due, to the CONTRACTOR, or to initiate applicable dispute resolution procedures and recover liquidated damages for nonperformance of this Agreement within the time stipulated.

When CONTRACTOR is in default for nonperformance within the stipulated Contract Times including any intermediate Milestone Dates, the DISTRICT shall notify the CONTRACTOR in writing within 3 Days after the Contract Times or intermediate Milestone Date, and deduct the liquidated damages in the amount stated in the Contract Documents from any monies due the CONTRACTOR.

The deductions of liquidated damages shall be in addition to any retainage withheld and shall be non-reimbursable.

The WORK shall be complete in accordance with the following schedule milestones:

The WORK shall be complete in accordance with the following schedule milestones:

Milestone No.	Milestone Description	Required Completion Date
1	Substantial Completion of the New Hydropneumatic Pump Station	December 31, 2027
2	Substantial Completion of All Other Project Elements	June 23, 2028
3	Final Completion of the Project	June 30, 2028

Liquidated damages for each calendar day that each milestone is not completely met, are as follows:

Milestone No.	Milestone Description	Amount of Liquidated Damages Per Day
1	Substantial Completion of the New Hydropneumatic Pump Station	$500
2	Substantial Completion of All Other Project Elements	$500
3	Final Completion of the Project	$500

11. MILESTONE COMPLETION

For a given milestone to be considered complete, the following portions of the WORK must be performed:

Milestone No. 1:

- All work required for operation of the hydropneumatic pump station including all aspects of the structure; mechanical equipment; electrical and controls wiring; pump and pump control equipment, hydropneumatic tank and piping connecting to new external suction and discharge piping
- Suction and discharge water main lines including all fittings and appurtenances. This milestone does not include the 8-inch suction piping that can only be constructed after demolition of the existing pump station structure.
- Successful completion of pipeline pressure testing and disinfection of pipe segments in accordance with Section 02643 – Water Pipeline Testing and Disinfection
- All connections to existing pipelines

Milestone No. 2:

- Relocation of the back-up power generator
- Demolition of existing booster station and disposal of material
- 8-inch suction piping that can only be constructed after demolition of the existing pump station structure.
- All remaining grading, drainage and site improvements

Milestone No. 3

- Completion of all other Work required by the Contract Documents, including but not limited to, demobilization, site cleanup and restoration and submittal of as-built drawings

12. COORDINATION AND INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

The Drawings and Specifications, Contract Change Orders, and all supplementary documents are essential parts of the Contract Documents, and a requirement occurring in one is as binding as though occurring in all. They are intended to be coordinated and to describe and provide for a complete Work.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these Contract Documents, the CONTRACTOR shall request of the DISTRICT such further explanations as may be necessary and shall conform to such explanations as part of the Contract. In the event of any doubt or question arising regarding the true meaning of these Contract Documents, reference shall be made to the DISTRICT, whose decision thereon shall be final. In the event of any discrepancy, between any drawings and the details written thereon, the details shall be taken as correct.

In the event of a conflict between the Agreement and any of the other Contract Documents, the Document highest in precedence shall control and supersede the Document which is contrary to it. The order of precedence of the Contract Documents is as follows:

First: Supplemental Agreements, the last in time being the first in precedence.

Second: The Agreement.

Third: Special Provisions.

Fourth: CONTRACTOR Bid.

Fifth: Notice to Contractors.

Sixth: Instruction to Bidders.

13. DISTRICT'S RIGHT TO PARTIAL USE

When provided for in the Contract Documents or agreed to in writing by the DISTRICT and the CONTRACTOR, the DISTRICT may notify the CONTRACTOR and begin using a portion of the Work even though it is not Substantially Complete. The CONTRACTOR and the DISTRICT shall agree on and document responsibilities for security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that portion of the Work being used by the DISTRICT. The DISTRICT and the CONTRACTOR inspect such portion of the Work and shall prepare a list of work to be completed or corrected before final acceptance. The DISTRICT's use of any portion of the Work shall not constitute final acceptance of that portion of the Work prior to Final Completion and acceptance of the Work as a whole. The DISTRICT shall allow the CONTRACTOR reasonable access to complete or correct work in areas being used by the DISTRICT. Partial beneficial occupancy shall not relieve the CONTRACTOR of its responsibility for Liquidated Damages, unless the Contract Documents expressly provide otherwise.

14. CONTRACTOR'S WORKING HOURS

The CONTRACTOR shall comply with the restrictions on working hours indicated in the Town of Truckee Encroachment Permit (7:00 AM to 7:00 PM Monday through Friday).

15. DISTRICT'S WORKING HOURS

The standard work day of the DISTRICT is the period from 7:30 AM to 4:00 PM. The standard work week begins on Monday and ends on Friday, excepting legal holidays. The DISTRICT's legal holidays are defined as the following: New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, the Friday after Thanksgiving, Christmas Eve and Christmas Day.

Should the CONTRACTOR choose to perform work outside of these standard working hours, the CONTRACTOR shall notify the DISTRICT a minimum of two working days beforehand.

The CONTRACTOR shall schedule all inspection, testing and other activities requiring DISTRICT participation during the DISTRICT's standard working hours. If the

CONTRACTOR desires to have inspection, testing or other activities requiring DISTRICT participation occur outside of those times, the CONTRACTOR shall reimburse the DISTRICT for the labor costs incurred by the DISTRICT.

In the event that DISTRICT inspectors, operations personnel, engineers or other agents of the DISTRICT are required to be at the Project site later than the standards working hours noted above, the CONTRACTOR shall reimburse the DISTRICT for the additional labor costs incurred by the DISTRICT. Such reimbursement shall occur under the following situations:

A. Failure by the CONTRACTOR to provide adequate labor or equipment to the Project resulting in the work extending later than the standard working hours on a given day.

B. Failure by the CONTRACTOR to properly plan and schedule the work, resulting in the work extending later than the standard hours on a given day.

C. Failure by the CONTRACTOR to take care when excavating near known existing facilities, resulting in damage to existing facilities, the repair of which extends later than the standard working hours on a given day.

D. The existence of a public safety hazard such as an active work zone, open trench, or similar situation that, in the opinion of the DISTRICT, required that DISTRICT personnel be present in order to protect public safety.

E. Any other situation which, in the opinion of the DISTRICT, requires that DISTRICT personnel be present in order to ensure proper prosecution of the Work in accordance with the Contract Documents that extends later than the standard working hours on a given day.

16. LIMITATION OF DISTRICT'S RESPONSIBILITIES

The DISTRICT 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 furnishing or performance of the Work. The DISTRICT will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

The DISTRICT will not be responsible for the acts or omissions of the CONTRACTOR or any Subcontractor, any Supplier, or any other person or organization performing or furnishing any portion of the Work.

17. CONSTRUCTION SAFETY

A. The CONTRACTOR shall follow construction procedures necessary to provide a safe working condition through all phases of the project. Said procedures shall conform to the Safety Orders, Division of Industrial Safety, Title 8, California Administrative Code and all other provisions required by Federal, State, County and Town law or ordinance. The CONTRACTOR shall also conform to all applicable requirements of the Federal Occupational Safety and Health Administration.

B. The CONTRACTOR is solely responsible for outlining the safety procedures to be followed by its workmen, all subcontractors, and related trades working on its job, and effectively assuring compliance with such procedures. The CONTRACTOR shall always provide for the safety of the public both day and night where they are exposed to its construction operation.

C. The DISTRICT, along with its representatives and agents, are not responsible for reviewing or approving the safety procedures followed by the CONTRACTOR.

END OF SECTION 00800

TRUCKEE DONNER PUBLIC UTILITY DISTRICT
11570 DONNER PASS ROAD
TRUCKEE, CA 95161

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

TECHNICAL SPECIFICATIONS

July 20, 2026



Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA
tel (530) 265-8021 www.sauerseng.com

TRUCKEE DONNER PUBLIC UTILITY DISTRICT
Sitzmark Hydropneumatic Booster Pump Station Replacement

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SECTION 01010
SUMMARY OF WORK

PART 1 – GENERAL

1.1 GENERAL

A. The WORK to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all WORK, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The WORK shall be complete, and all WORK, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete, safe and proper construction of the WORK in good faith shall be provided by the CONTRACTOR as though originally so indicated, at no increase in cost to the DISTRICT

1.2 BACKGROUND

A. The main purpose of this project is to construct a new hydropneumatic booster pump station to convey water from an existing tank and pipeline near Sitzmark Way to an existing high pressure zone and to demolish and remove an existing hydropneumatic pump station on the same site.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The WORK of this project comprises the following:

1. Provide all necessary submittals and records set forth in the Contract Documents.

2. Mobilize equipment to the project site. The DISTRICT has not secured an off-site location for storage of equipment and materials. The CONTRACTOR shall store materials and equipment at the site in a manner that will not impede traffic or endanger the public. The DISTRICT has designated certain locations for the storage and screening of soil materials. In some cases, due to site size restrictions, the CONTRACTOR may have to store materials elsewhere. Acquisition of any additional storage areas shall be the responsibility of the CONTRACTOR as described in Section 01550 – Site Access and Storage. In all cases, the CONTRACTOR shall be responsible for the safe storage and transport of the material to the jobsite.

3. Install the building, concrete, driveway, grading, pump systems, generator, electrical, controls, instrumentation, water mains, fire hydrants, valves, fittings, conduits, pull boxes, vaults, switchpads and ancillary items as shown on the Drawings.

4. Demolish and remove the existing booster pump station including building, concrete, mechanical equipment, electrical equipment, pressure tank, pipelines, valves, and ancillary items shown on the plans.

4. The CONTRACTOR shall be responsible to ensure that the new pumps, manifolds, valves, and pipelines are thoroughly disinfected, pressure tested and

flushed in a manner acceptable to the DISTRICT, prior to connecting to the existing water system.

1.4 SUBSURFACE CONDITIONS

A. The CONTRACTOR is advised that subsurface conditions may vary throughout the project site. The DISTRICT makes no guaranty, either written or implied, that materials obtained on site are suitable for use in the WORK. The CONTRACTOR shall not be entitled to any additional compensation in the event that materials obtained on site are not suitable for use in the WORK.

B. The CONTRACTOR is hereby notified that investigations of subsurface groundwater conditions have not been conducted in conjunction with the preparation of these Contract Documents. The CONTRACTOR is further advised that subsurface groundwater conditions may vary throughout the project site. Groundwater may be naturally occurring or may be leakage from existing water system facilities. The CONTRACTOR shall be responsible for removal and exclusion of groundwater as necessary to construct the Work in accordance with the Contract Documents. The CONTRACTOR shall not be entitled to any additional compensation in the event that groundwater is encountered.

1.5 CONTRACT METHOD

A. The WORK hereunder will be constructed under a combination lump sum and unit price Contract. Payment for WORK shall be as described in Section 00310 – Measurement and Payment.

1.6 EXPRESSION OF CONTRACTOR RESPONSIBILITY IN THE TECHNICAL SPECIFICATIONS

A. Whenever in the Technical Specifications, requirements are expressed with active verbs and no subjects, the words, "The CONTRACTOR shall," have been omitted as a matter of style, and it is intended that the CONTRACTOR is the party responsible for taking the action required.

1.7 WORK SEQUENCE AND SCHEDULING CONSTRAINTS

A. The CONTRACTOR shall schedule and perform the WORK in such a manner as to result in the least possible disruption to the public's use of roadways, driveways, and utilities. Utilities shall include water, sewerage, drainage structures, ditches and canals, gas, electric, cable television, telecommunications and telephone. The approximate locations of existing utilities are indicated on the Drawings. However, there is no guarantee as to accuracy or completeness.

B. In accordance with the Lahontan RWQCB requirements, the CONTRACTOR shall not perform any earth disturbing activities after October 15, 2026. Any existing open excavations may be left open provided that they are essential to ongoing work activities. No later than October 30, 2026, the CONTRACTOR shall proceed to backfill any open excavations, place temporary and/or permanent erosion control measures and winterize project site.

1. The CONTRACTOR may leave equipment and materials, including soils at the project site over the Winter of 2026-27. Soils materials shall be contained

using silt fencing and shall be covered with tarps, plastic sheeting or similar measures. The CONTRACTOR shall take all appropriate measures to protect the equipment and materials from damage, weather and vandalism. The DISTRICT accepts no liability for any items that are damaged or become unusable over the Winter of 2026-27.

D. The CONTRACTOR is referred to the Contract Milestones given in Articles 10 & 11 of Section 00800 – Special Provision for additional schedule constraints.

1.8 CONTRACTOR USE OF PROJECT SITE

A. The CONTRACTOR'S use of the Project Site shall be limited to its construction operations related to this Contract only.

1.9 STORAGE

A. Storage conditions shall be in accordance with manufacturer's instructions and be acceptable to the DISTRICT for all materials and equipment not incorporated into the WORK but included in Applications for Payment. Proper environmental conditions shall be maintained by the CONTRACTOR at all storage facilities. The CONTRACTOR shall obtain any necessary off-site storage facilities and such facilities shall be accessible to the DISTRICT. The stored materials shall be insured for full value. Certificates of liability insurance coverage shall be submitted to the DISTRICT with the request for payment. All arrangements and costs for storage facilities shall be paid by the CONTRACTOR.

1.10 NOTICES TO OWNERS OF ADJACENT PROPERTIES AND UTILITIES

A. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may affect them.

B. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, the CONTRACTOR shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit any resulting inconvenience.

C. Utilities and other concerned agencies shall be contacted at least 7 days prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.

D. The CONTRACTOR shall review with the various utility companies the construction methods, safety procedures, and WORK to be done in the vicinity of utilities. When temporary relocation of utilities is necessary, sufficient advance notice shall be given to the utility involved.

1.11 LINES AND GRADES

A. All Work shall be done to the lines, grades, and elevations indicated in the Contract Documents.

B. The CONTRACTOR shall employ experienced instrument personnel, competent assistants, and such instruments, tools, stakes, and other materials required to complete

the survey, layout, and measurement Work.

C. The CONTRACTOR shall remove and reconstruct WORK which is improperly located.

D. The CONTRACTOR is referred to Section 01300 - Contractor Submittals, for record information requirements regarding lines and grades.

1.12 PROJECT TIMELINES

A. Preconstruction Conference:

1. Prior to the commencement of WORK at the Site, a preconstruction conference will be held at the offices of the DISTRICT. The Conference shall be attended by the CONTRACTOR'S Project Manager, its Superintendent, and its Subcontractors as the CONTRACTOR deems appropriate. Other attendees will be:

a. Representatives of DISTRICT

b. Governmental representatives as appropriate, including other local utilities

c. Others as requested by CONTRACTOR or DISTRICT

2. The purpose of the conference is to designate responsible personnel, discuss Contract requirements, and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The complete agenda will be furnished to the CONTRACTOR prior to the meeting date. However, CONTRACTOR shall be prepared to discuss all of the items listed below.

a. CONTRACTOR’S assignments for safety and first aid, including designated competent person(s) and the CONTRACTOR’S safety representative.

b. Status of CONTRACTOR’S insurance and bonds.

c. CONTRACTOR’S construction schedule.

d. Transmittal, review, and distribution of CONTRACTOR'S submittals.

e. Processing applications for payment.

f. Maintaining record documents.

g. Critical Work sequencing.

h. Field decisions and Change Orders.

i. Use of Project Site, storage areas, security and housekeeping.

j. Equipment deliveries and priorities.

k. Permits required for construction.

l. Utilities required for construction.

m. Contract authority and channels of communication.

n. Coordination with others.

o. Tree removal

3. The DISTRICT will preside at the preconstruction conference and will arrange for keeping and distributing the minutes to all persons in attendance.

4. The following emergency contacts for the DISTRICT are designated:

Neil Kaufman: (530) 582-3950 or (530) 448-3018

TJ Dwyer: (530) 582-3955 or (530) 448-4734

B. Progress Meetings:

1. The DISTRICT will schedule and hold progress meetings as deemed necessary by the DISTRICT. The CONTRACTOR, DISTRICT and all Subcontractors active on the Site shall attend each meeting. The CONTRACTOR may at its discretion request attendance by representatives of its Suppliers, manufacturers, and other Subcontractors.

2. The DISTRICT will preside at the meetings and will arrange for keeping and distributing the minutes. The purpose of the meetings will be to review the progress of the WORK, discuss safety, maintain coordination of efforts, discuss commercial issues, discuss changes in scheduling, and resolve other problems which may develop. During each meeting, the CONTRACTOR is required to present any issues which may impact its WORK, with a view to resolve these issues expeditiously.

1.13 PUBLIC AWARENESS

A. The CONTRACTOR is hereby notified that the general public and project site neighbors have concerns relative to construction of the station. The construction planning and scheduling must continue to address the concerns presented by the neighborhood.

B. The following are sensitive issues related to general public and project site neighbors:

1. Safety in General is the most important Public Awareness issue. Safety in General includes the following:

a. Safety of children pertaining to school travel and play.

b. Safety of pedestrian areas around the construction area.

c. Safety of neighborhood vehicular traffic around the construction area.

d. Safety of personal property around the construction area.

e. Safe and effective traffic control measures

2. Dust control.

3. Minimizing inconvenience to the community and neighborhood. (i.e., access to businesses and residences).

4. Control and limiting of construction traffic.

5. Working cleanly within public rights-of-way.

6. Staging and coordination of construction activity.

7. Precautions to minimize noise.

8. Maintenance and utilization of construction employee parking.

9. Timely project completion.

10. Working hours.

C. The CONTRACTOR is hereby notified that the DISTRICT may hold periodic meetings with public citizens who reside in the neighborhood and community surrounding the Site. The DISTRICT will notify the CONTRACTOR of the dates of such meetings in writing at least 5 days prior to a meeting.

D. At the request of the DISTRICT, the CONTRACTOR'S representative shall attend up to 3 such meetings. The meetings will likely be held on weekdays after conclusion of the standard work day.

1.14 CONSTRUCTION SAFETY

A. The CONTRACTOR shall follow construction procedures necessary to provide a safe working condition through all phases of the project. Said procedures shall conform to the Safety Orders, Division of Industrial Safety, Title 8, California Administrative Code and all other provisions required by Federal, State, County and Town law or ordinance. The CONTRACTOR shall also conform to all applicable requirements of the Federal Occupational Safety and Health Administration.

B. The CONTRACTOR is solely responsible for outlining the safety procedures to be followed by its workmen, all subcontractors, and related trades working on its job, and effectively assuring compliance with such procedures. The CONTRACTOR shall always provide for the safety of the public both day and night where they are exposed to its construction operation.

C. The DISTRICT, its representatives, contractors, agents and field inspectors are not responsible for reviewing or approving the safety procedures followed by the

CONTRACTOR.

1.15 WORK BY OTHERS

A. None

1.16 TREE REMOVAL AND TREE PROTECTION

A. The CONTRACTOR shall conduct its operations to minimize the need for tree removal and to minimize damage to existing trees along the project alignment.

B. The DISTRICT recognizes the removal of some trees is necessary to construct the project. As a part of the preconstruction conference, the DISTRICT and the CONTRACTOR shall perform an inspection of the project and identify all tress to be removed. Trees to be removed shall be marked with a ribbon or similar identifying method.

C. Removal of low hanging tree branches that may interfere with operation of excavation equipment shall be allowed and shall be performed by the CONTRACTOR. Branches to be removed shall also be identified during the inspection noted above.

D. The CONTRACTOR shall install wooden barricades or other protective measures to prevent scarring and damage to the trunks of existing trees to remain.

E. Removed trees and branches shall not be left at the project site. Removed tress and branches shall not be burned at the project site. The CONTRACTOR (or a subcontractor) may resell the trees for commercial purposes provide that the CONTRACTOR (or a subcontractor) is appropriately licensed. The CONTRACTOR shall be responsible to submit any and all documentation such as a timber harvest permit to the appropriate regulatory authority.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01070
ABBREVIATIONS OF INSTITUTIONS

PART 1 – GENERAL

1.1 GENERAL

A. Wherever in the Contract Documents references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the reader, the following acronyms or abbreviations which may appear in the Contract Documents shall have the meanings indicated herein.

1.2 ABBREVIATIONS

AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
ASABE	American Society of Agricultural and Biological Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturer's Association
CBM	Certified Ballast Manufacturers
CEMA	Conveyors Equipment Manufacturer's Association
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
EPA	Environmental Protection Agency

FM	Factory Mutual System
FPL	Forest Products Laboratory
HI	Hydraulic Institute
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
ICEA	Insulated Power Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
ISA	Instrument Society of America
ISO	Insurance Services Office
ISO	International Organization for Standardization
MBMA	Metal Building Manufacturer's Association
MPTA	Mechanical Power Transmission Association
MSS	Manufacturers Standardization Society
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturer's
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NLGI	National Lubricating Grease Institute
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PPI	Plastics Pipe Institute
RCRA	Resource Conservation and Recovery Act
RWMA	Resistance Welder Manufacturer's Association
RWQCB	Regional Water Quality Control Board
SAE	Society of Automotive Engineers
SDWA	Safe Drinking Water Act
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry, Inc.
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
SWPPP	Stormwater Pollution Prevention Plan
SWQCB	State Water Quality Control Board
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WEF	Water Environment Federation
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01090
REFERENCE STANDARDS

PART 1 – GENERAL

1.1 GENERAL

A. **Titles of Sections and Paragraphs:** Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.

B. **Applicable Publications:** Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Contract Documents shall be waived because of any provision of, or omission from, said standards or requirements.

C. **Specialists and Assignments:** In certain instances, specification text requires (or implies) that specific WORK is to be assigned to specialists or expert entities, who must be engaged for the performance of that WORK. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the CONTRACTOR.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all WORK specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.

B. References herein to "Building Code" or "Uniform Building Code" shall mean Uniform Building Code of the International Conference of Building Officials (ICBO). Similarly, references to "Mechanical Code" or "Uniform Mechanical Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the Work is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be

brought to the attention of the DISTRICT for clarification and direction prior to ordering or providing any materials or furnishing labor. The CONTRACTOR shall bid for the most stringent requirements.

D. The CONTRACTOR shall construct the Work indicated herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.

E. **Applicable Standard Specifications:** References in the Contract Documents to the "Standard Specifications" shall mean the “Standard Specifications. State of California, Department of Transportation” latest edition at time of Bid preparation. Only those portions of the “Standard Specifications” specifically identified and referred to shall apply. Portions of the “Standard Specifications” not specifically referenced shall not be considered part of the Contract Documents.

F. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

G. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.3 REGULATIONS RELATED TO HAZARDOUS MATERIALS

A. The CONTRACTOR is responsible that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

B. Where no specific regulations exist, all chemical, hazardous, and petroleum product piping and storage in underground locations must be installed with double containment piping and tanks, or in separate concrete trenches and vaults, or with an approved lining which cannot be penetrated by the chemicals, unless waived in writing by the DISTRICT.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01300
CONTRACTOR SUBMITTALS

PART 1 – GENERAL

1.1 GENERAL

A. CONTRACTOR “Submittals” may be Shop Drawings, schedules, surveys, reports, samples, plans, lists, drawings, documents, findings, programs, manuals, data, or any other item or information required by the Contract Documents to be submitted or offered by the CONTRACTOR in accomplishing the Work.

B. Wherever submittals are required hereunder, all such documents shall be furnished to the DISTRICT.

C. The CONTRACTOR is responsible for the accuracy, completeness, and coordination of all Submittals. The CONTRACTOR shall not delegate this responsibility in whole or in part to any Subcontractor. Submittals may be prepared by the CONTRACTOR, Subcontractors or Suppliers, but the CONTRACTOR shall verify that each Submittal meets the requirements of the Contract Documents. Verify that there are no conflicts between Submittals and notify the DISTRICT in each case where a Submittal may affect the work of another contractor or the DISTRICT. The CONTRACTOR shall ensure coordination of Submittals of related crafts and Subcontractors.

1.2 PRECONSTRUCTION CONFERENCE SUBMITTALS

A. Prior to the preconstruction conference referred to in Section 01010 – Summary of Work, submit the following items for review:

1. A preliminary schedule of Shop Drawings, Samples, and proposed Substitute ("Or- Equal") Submittals listed in the Bid.

2. A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency required to grant the permit, the expected date of submittal for the permit, and required date for receipt of the permit.

3. The names and qualifications of Designated Safety Representative And Designated Competent Persons.

4. Preliminary Progress Schedule in accordance with Section 01310 – Construction Schedule.

1.3 PROGRESS REPORTS

A. The CONTRACTOR shall furnish a progress report to DISTRICT with each Application for Payment. If the WORK falls behind schedule, submit additional progress reports at such intervals as DISTRICT may request.

B. Each progress report shall include sufficient narrative to describe any current and anticipated delaying factors, effect on the construction schedule, and proposed corrective actions. Any WORK reported complete, but which is not readily apparent to DISTRICT, must be substantiated with satisfactory evidence.

C. Each progress report shall include a list of the activities completed with their actual start and completion dates, a list of the activities currently in progress, and the number of Working days required to complete each.

1.4 SHOP DRAWINGS

A. Wherever called for in the Contract Documents, or where required by the DISTRICT, furnish for review one copy of each Shop Drawing Submittal in electronic PDF format. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication, and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. Whenever the CONTRACTOR is required to submit design calculations as part of a Submittal, such calculations shall bear the signature and seal of a professional engineer registered in the appropriate branch in California unless otherwise directed.

B. All Shop Drawing Submittals shall be accompanied by a Submittal transmittal form acceptable to the DISTRICT. The form shall indicate the Contract number and all specification references necessary to clearly denote which Contract requirements are being satisfied by the Submittal. Any Submittal not accompanied by such a form, or where all applicable items on the form are not completed, will be returned for resubmittal.

C. Normally, a single Shop Drawing Submittal shall be used for each technical specification section or item or class of material or equipment for which a Submittal is required. A single Submittal covering multiple sections will not be acceptable, unless the primary specification references other sections for components. Example: If a pump section references other sections for the motor, protective coating, anchor bolts, local control panel, and variable frequency drive, a single submittal would be accepted. However, a single Submittal covering vertical turbine pumps and horizontal split case pumps would not be acceptable.

D. On the transmittal form, index the components of the Submittal and insert tabs in the Submittal to match the components. Relate the Submittal components to Specification paragraph and subparagraph, Drawing number, detail number, schedule title, or room number or building name, as applicable.

E. Unless indicated otherwise, terminology and equipment names and numbers used in Submittals shall match the Contract Documents.

F. Format:

1. Minimum sheet size shall be 8.5 inches by 11 inches. Maximum sheet size shall be 24 inches by 36 inches. Every page in a Submittal shall be numbered in sequence. Each copy of a Submittal shall be collated and stapled or bound, as appropriate. The DISTRICT will not collate copies.

2. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with all pertinent data, capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports. Sufficient level of detail shall be presented for assessment of compliance with the Contract Documents.

3. Each Submittal shall be assigned a unique number. Submittals shall be numbered sequentially. The Submittal numbers shall be clearly noted on the transmittal. Original Submittals shall be assigned a numeric Submittal number. Resubmittals shall bear an alpha-numeric system which consists of the number assigned to the original Submittal for that item followed by a letter of the alphabet to represent that it is a subsequent Submittal of the original. For example, if Submittal 25 requires a resubmittal, the first resubmittal will bear the designation “25-A” and the second resubmittal will bear the designation “25-B” and so on.

G. Disorganized Submittals which do not meet the requirements above will be returned without review.

H. Except as may otherwise be indicated herein, the DISTRICT will return a ***Submittal Review*** form to the CONTRACTOR with review comments noted thereon, within 7 calendar days following receipt of a given submittal. For resubmittal of Submittals, the DISTRICT will be allowed the same review period as for the original Submittal. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable Submittal to the DISTRICT by the second submission of a Submittal item. The DISTRICT reserves the right to withhold monies due to the CONTRACTOR to cover additional costs of the review beyond the second Submittal.

I. If a Submittal is marked "NO EXCEPTIONS," formal revision and resubmission of said Submittal will not be required.

J. If a Submittal is marked "MAKE CORRECTIONS NOTED," formal revision and resubmission of said Submittal will not be required.

K. If a Submittal is marked "AMEND & RESUBMIT," the CONTRACTOR shall revise and resubmit said Submittal as indicated by the DISTRICT’s review comments. Resubmittal of portions of multi-page documents or multi-drawing documents will not be allowed. For example, if a Shop Drawing Submittal that consists of ten drawings contains only one drawing that needs to be amended and resubmitted, the Submittal as a whole is deemed as “AMEND & RESUBMIT”, and all ten drawings of the Submittal would be required to be resubmitted.

L. If a Submittal is returned to the CONTRACTOR marked "REJECTED," the CONTRACTOR shall revise and resubmit said Submittal as indicated by the DISTRICT’s review comments. Resubmittal of portions of multi-page documents or multi-drawing documents will not be allowed. For example, if a Shop Drawing Submittal that consists of ten drawings contains only one drawing that is rejected and needs to be resubmitted, the Submittal as a whole is deemed as “REJECTED”, and all ten drawings of the Submittal would be required to be resubmitted.

M. Any changes made on a resubmittal, other than those made or requested by the DISTRICT, shall be identified and flagged on the resubmittal.

N. Fabrication of an item shall be commenced only after the DISTRICT has reviewed the pertinent submittals and has returned copies to the CONTRACTOR marked either "NO EXCEPTIONS" or “MAKE CORRECTIONS NOTED." Corrections indicated on Submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the Contract requirements.

O. All Shop Drawing Submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR, prior to submission. Each Submittal shall be dated, signed with the following: “I have verified that the equipment or material in this Submittal meets all the requirements specified or shown in the Contract Documents without exception.” In the case of Shop Drawings, each sheet shall be so dated, signed, and certified. No consideration for review of any Submittals will be made for any items which have not been so certified. All non-certified Submittals will be returned without action taken, and any delays caused thereby shall be the total responsibility of the CONTRACTOR. Submittals which the CONTRACTOR wishes to have reviewed that cannot bear this certification because they include an exception or deviation to the Contract Documents shall be submitted in accordance with Section 01600 - Products, Materials, Equipment, and Substitutions.

P. The DISTRICT’s review of Shop Drawing Submittals shall not relieve the CONTRACTOR of the entire responsibility for the correctness of details and dimensions and for compliance with the Contract Documents. The CONTRACTOR shall assume all responsibility and risk for any misfits due to any errors in Submittals. The CONTRACTOR shall be responsible for the dimensions and the design of adequate connections and details.

Q. No changes in the Contract Times will be considered for schedule delays resulting from non-compliant Submittals.

R. Within 30 days of the Notice to Proceed, the CONTRACTOR shall submit a complete list of anticipated Submittals which includes Specification and Drawing references.

S. If the CONTRACTOR submits an incomplete Submittal, the Submittal may be returned without review. A complete Submittal shall contain sufficient data to demonstrate that the items contained therein comply with the Contract Documents, meet the minimum requirements for Submittals as described in the Contract Documents, and include all corrections as required from previous Submittals.

1.5 CONTRACTOR'S SCHEDULE

A. The CONTRACTOR'S construction schedules and reports shall be prepared and submitted to the DISTRICT in accordance with the provisions of Section 01310 - Progress Schedule.

1.6 SAMPLES

A. Whenever in the Specifications samples are required, submit not less than three samples of each item or material for acceptance, at no additional cost to the DISTRICT.

B. Samples, as required herein, shall be submitted for acceptance a minimum of 21 days prior to ordering such material for delivery to the jobsite, and shall be submitted in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delays in the WORK.

C. All samples shall be individually and indelibly labeled or tagged, indicating thereon all specified physical characteristics and Manufacturer's name for identification. Upon receiving acceptance of the DISTRICT, one set of the samples will be stamped and dated and returned to the CONTRACTOR, and two sets of samples will be retained,

and one set of samples shall remain at the job site until completion of the Work.

D. Unless indicated otherwise, all colors and textures of specified items presented in sample submittals shall be from the manufacturer's standard colors and standard materials, products, or equipment lines. If the samples represent non-standard colors, materials, products, or equipment lines and their selection will require an increase in contract time or price, clearly indicate same on the transmittal page of the submittal.

1.7 SURVEY DATA

A. The CONTRACTOR shall make available for examination throughout the construction period all field books, notes, and other data developed by CONTRACTOR in performing the surveys required by the WORK and submit all such data to DISTRICT with documentation required for final acceptance of the WORK.

1.8 OPERATIONS AND MAINTENANCE MANUAL

A. The preparation and submission of Operations and Maintenance Manuals is not included in the WORK or this Contract.

1.9 RECORD DRAWINGS

A. The CONTRACTOR shall prepare Record Drawings as required in Section 1305 – Record Drawings.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01305
RECORD DRAWINGS

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall prepare and maintain Record Drawings during conduct of the WORK. The Record Drawings shall comply with the format and content requirements given herein.

1.2 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall submit copies of Record Drawings to the DISTRICT in accordance with Section 01300 – Contractor Submittals.

PART 2 -- PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 RECORD DRAWING PROCEDURES

A. The CONTRACTOR shall prepare and maintain one record set of Drawings at the Site. On these, the CONTRACTOR shall mark in red ink all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to indicate fully the Work as actually constructed.

B. These master record drawings of the CONTRACTOR'S representation of as-built conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of the WORK. Failure to properly maintain record drawings in an up-to-date condition will result in a reduction of payment for each month of $5,000 until the drawings are brought up-to-date.

C. In the case of those drawings which depict the detailed requirements 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. Record drawings shall be accessible to the DISTRICT at all times during the construction period.

E. Final Application for Payment will not be acted upon until the record drawings have been prepared and delivered to the DISTRICT. Said up-to-date record drawings shall be in the form of a set of prints with information carefully plotted in red.

F. Upon Substantial Completion of the WORK, and prior to Final Acceptance, the CONTRACTOR shall finalize and deliver a complete set of record drawings to the DISTRICT. This set of drawings shall consist of corrected drawings showing the reported location of the WORK. The information submitted by the CONTRACTOR and incorporated by the DISTRICT into the record drawings will be assumed to be correct, and the CONTRACTOR shall be responsible for the accuracy of such information, and for any errors or omissions which may appear on the record drawings as a result.

* * END OF SECTION * *

SECTION 01310
CONSTRUCTION PROGRESS SCHEDULE

PART 1 – GENERAL

1.1 REQUIREMENTS OVERVIEW

A. The CONTRACTOR'S planning, scheduling and execution of the WORK shall be presented to the DISTRICT by submission of the schedule information and data indicated in this Section.

B. In preparing all schedules, it is the responsibility of the CONTRACTOR to work with each Subcontractor and Supplier to obtain information pertinent to the planning and updating of their respective activities and schedules.

PART 2 – PRODUCTS

2.1 GENERAL CRITERIA

A. The Progress Schedule shall reflect the CONTRACTOR's plans for and status of the WORK.

B. The Progress Schedule shall show the breakdown of work into activities and relationships only to the extent required to effectively manage the WORK. The Schedule shall show the division of the WORK into activities and specify the progression from the Notice To Proceed to the end of the Contract Times. The Preliminary Progress Schedule shall include appropriate time allowances and constraints for submittals, items of interface with work performed by others, and construction, start-up, and performance tests.

C. The CONTRACTOR's Progress Schedule shall include all procurement related activities that lead to delivery of permanent materials to the Site in a timely manner. The procurement activities shall indicate significant events in the procurement process such as issuance of purchase orders and subcontracts, submittal of shop drawings, review and approval of shop drawings, release for fabrication, release for shipment, delivery dates for major materials and equipment, etc., as appropriate.

D. The CONTRACTOR shall schedule those required duties and responsibilities of the DISTRICT within the Contract Times. The Progress Schedule shall incorporate activities and sequences based on the information given in the Contract Documents, and if not given, as indicated by the DISTRICT in writing.

E. The Preliminary Progress Schedule shall identify the start and completion dates for work activities for which the CONTRACTOR is entitled to payment.

F. The Progress Schedule shall be in a precedence diagram format, shall be plotted on a time-scaled calendar, and shall identify the Contract Times, milestones, the critical path(s), and all activities. Activities shall be shown on their early dates, with their total float noted beside them. Connections between activities, whether on the same sheet or on different sheets, shall identify both the predecessor and successor work.

2.2 SCHEDULE SUBMITTAL

A. The CONTRACTOR shall produce a Preliminary Progress Schedule submittal that will be an accurate representation of the proposed means and methods for accomplishing the WORK. This schedule will show all logical relationships and constraints between activities. This schedule shall be available for discussion at the Preconstruction Conference described in Section 01010 – Summary of Work.

2.3 MONTHLY PROGRESS REPORTS

A. The CONTRACTOR shall submit to the DISTRICT, a report indicating the monthly and cumulative cost totals for the WORK. The report shall be in format developed by the CONTRACTOR and reviewed by the DISTRICT.

PART 3 – EXECUTION

3.1 SCHEDULE UPDATES

A. The CONTRACTOR shall keep the Progress Schedule current and shall update it on a weekly basis. A copy of the current progress schedule shall be made available to the DISTRICT upon request.

B. A copy of the updated Progress Schedule shall be submitted with each request for payment.

* * END OF SECTION * *

SECTION 01400
QUALITY ASSURANCE/QUALITY CONTROL

PART 1 – GENERAL

1.1 SITE INVESTIGATION AND CONTROL

A. The CONTRACTOR shall check and verify all dimensions and conditions in the field continuously during construction. The CONTRACTOR shall be solely responsible for any inaccuracies built into the Work due to the CONTRACTOR's (including Subcontractor's) failure to comply with this requirement.

B. The CONTRACTOR shall inspect related and appurtenant WORK and report in writing to the DISTRICT any conditions which will prevent proper completion of the WORK. Failure to report such conditions shall constitute acceptance of all Site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the CONTRACTOR solely and entirely at CONTRACTOR's expense.

1.2 INSPECTION OF THE WORK

A. All WORK performed by the CONTRACTOR and Subcontractors shall be inspected by the CONTRACTOR’s full time Quality Control inspector. Nonconforming WORK and any safety hazards in the work area shall be noted and promptly corrected. The CONTRACTOR is responsible for the WORK to be performed safely and in conformance to the Contract Documents.

B. The WORK shall be conducted under the general observation of the DISTRICT to ensure strict compliance with the Contract Documents. Such inspection may include mill, plant, shop, or field inspection as required. The DISTRICT, and any designated representatives shall be permitted access to all parts of the WORK, including plants where materials or equipment are manufactured or fabricated.

C. The presence of the DISTRICT, or any designated representatives shall not relieve the CONTRACTOR of the responsibility for the proper execution of the WORK in accordance with all requirements of the Contract Documents. Compliance is the responsibility of the CONTRACTOR. No act or omission on the part of the DISTRICT or any designated representatives shall be construed as relieving CONTRACTOR of this responsibility. Inspection of WORK later determined to be nonconforming shall not be cause or excuse for acceptance of the nonconforming WORK. The DISTRICT may accept nonconforming WORK when adequate compensation is offered and it is in the DISTRICT’s best interest as determined by the DISTRICT.

D. All materials and articles furnished by the CONTRACTOR or Subcontractors shall be subject to rigid documented inspection by qualified personnel, and no materials or articles shall be used in the WORK until they have been inspected and accepted by the CONTRACTOR's Quality Control representative. No WORK shall be backfilled, buried, cast in concrete, covered, or otherwise hidden until it has been inspected by the DISTRICT. Any WORK covered in the absence of inspection shall be subject to uncovering. Where uninspected WORK cannot be easily uncovered, such as in concrete cast over reinforcing steel, all such WORK shall be subject to demolition, removal, and reconstruction under proper inspection.

E. All materials and articles furnished to the CONTRACTOR by the DISTRICT shall be subject to rigid inspection by the CONTRACTOR's Quality Control representative before being used or placed by the CONTRACTOR. The CONTRACTOR shall inform the DISTRICT, in writing, of the results of said inspections within one working day after completion of inspection. In the event that the CONTRACTOR believes any material or articles provided by the DISTRICT to be of insufficient quality for use in the WORK, the CONTRACTOR shall immediately notify the DISTRICT.

1.3 TIME OF INSPECTIONS AND TESTS

A. Samples and test specimens required under these Specifications shall be furnished and prepared for testing in ample time for the completion of the necessary tests and analyses before said articles or materials are to be used. The CONTRACTOR shall furnish and prepare all required test specimens at the CONTRACTOR's own expense. As provided in the Contract Documents, performance of the certain tests will be by the DISTRICT, and all costs therefor will be borne by the DISTRICT at no cost to the CONTRACTOR except that the costs of any test which shows unsatisfactory results shall be backcharged to the CONTRACTOR.

B. Whenever the CONTRACTOR is ready to backfill, bury, cast in concrete, hide, or otherwise cover any WORK under this Contract, the DISTRICT shall be notified not less than 24 hours in advance to request inspection before beginning any such WORK of covering. Failure of the CONTRACTOR to notify the DISTRICT at least 24 hours in advance of any such inspections shall be reasonable cause for the DISTRICT to order a sufficient delay in the CONTRACTOR's schedule to allow time for such inspection. The costs of any remedial, or corrective work required, and all costs of such delays, including its impact on other portions of the WORK, shall be borne by the CONTRACTOR.

1.4 SAMPLING AND TESTING

A. When not otherwise indicated, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered. However, the DISTRICT reserves the right to use any generally-accepted system of inspection that, in the opinion of the DISTRICT, will ensure that the quality of the workmanship is in full accord with the Contract Documents.

B. The DISTRICT reserves the right to waive tests or quality assurance measures, but waiver of any specific testing or other quality assurance measure, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the indicated testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, the DISTRICT shall reserve the right to make independent investigations and tests as specified in the following paragraph and failure of any portion of the WORK to meet any of the qualitative requirements of the Contract Documents, shall be reasonable cause for the DISTRICT to require the removal or correction and reconstruction of any such WORK.

D. In addition to any other inspection or quality assurance provisions that may be indicated, the DISTRICT shall have the right to independently select, test, and analyze,

at the expense of the DISTRICT, additional test specimens of any or all of the materials to be used. Results of such tests and analyses shall be considered along with the tests or analyses made by the CONTRACTOR to determine compliance with the applicable specifications for the materials so tested or analyzed, provided that wherever any portion of the WORK is discovered, as a result of such independent testing or investigation by the DISTRICT, which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such WORK shall be borne by the CONTRACTOR.

1.5 RIGHT OF REJECTION

A. The DISTRICT shall have the right at all times and places to reject any articles or materials to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the WORK at the Site. If the DISTRICT, through an oversight or otherwise, has accepted materials or WORK which are defective or in any way contrary to the Contract Documents, such materials, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected.

B. The CONTRACTOR shall promptly remove or replace rejected articles or materials from the Site of the Work after notification of rejection.

C. All costs of removal and replacement of rejected articles or materials shall be borne by the CONTRACTOR at no increased cost to the DISTRICT.

D. Failure to promptly remove and replace rejected WORK shall be considered a breach of this contract and the DISTRICT may, after 7 days notice, terminate the CONTRACTOR'S right to proceed with the affected WORK and remove and replace the Work and issue a backcharge to cover the cost of the WORK.

1.6 CONTRACTOR'S QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

A. The CONTRACTOR shall establish and execute a Quality Assurance/Quality Control (QA/QC) program for the services which are being procured from the CONTRACTOR. The program shall provide the CONTRACTOR with adequate measures for verification and conformance to defined requirements by its personnel and lower-tier Subcontractors (including fabricators, suppliers, and sub-subcontractors). This program shall be described in a QA/QC Plan responsive to this Section.

1.7 TESTING SERVICES

A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to the DISTRICT. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped and fully qualified to perform the tests in accordance with the specified standards.

B. The CONTRACTOR's independent testing laboratory shall be accredited by the American Association of State Highway and Transportation Officials (AASHTO) for the tests they will perform and as appropriate to the construction work being performed. The CONTRACTOR's laboratory shall also be AASHTO accredited in the following:

1. ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

2. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design/Construction.

3. ASTM D3666 - Specifications for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.

C. The DISTRICT shall have the right to inspect work performed by the independent testing laboratory both at the project and at the laboratory. This shall include inspection of the independent testing laboratory's internal quality assurance records (quality assurance manual, equipment calibrations, proficiency sample performance, etc.).

D. The CONTRACTOR shall obtain the DISTRICT'S acceptance of the testing firm before having services performed, and shall pay all costs for these testing services.

E. Testing services provided by the DISTRICT, if any, are for the sole benefit of the DISTRICT. However, test results shall be available to the CONTRACTOR. Testing necessary to satisfy the CONTRACTOR's internal quality control procedures shall be the sole responsibility of the CONTRACTOR.

F. **Testing Services Furnished by CONTRACTOR:** Unless otherwise indicated, the CONTRACTOR shall furnish all testing services in connection with the following materials as required for DISTRICT's review:

1. Concrete materials and mix designs.

2. Embankment, fill, and backfill materials.

3. All other tests and engineering data required for the DISTRICT's review of materials and equipment proposed to be used in the Work.

G. **Testing Services furnished by the DISTRICT**:

1. Unless otherwise indicated, the DISTRICT will provide Quality Control testing services in connection with the following materials and equipment incorporated in the WORK:

a. Concrete strength tests.

b. Moisture-density and relative density tests on embankment, fill, and backfill materials.

c. In-place field density test on embankments, fills, and backfill.

d. Other materials and equipment as indicated herein.

2. Testing, including sampling, shall be performed by the DISTRICT or the DISTRICT's testing firm's laboratory personnel, in general manner and frequency indicated in the Specifications.

3. The testing firm's laboratory shall perform all laboratory tests within a reasonable time consistent with the specified standards and will furnish a written report of each test.

4. The CONTRACTOR shall furnish all sample materials and cooperate in the testing activities, including sampling. The CONTRACTOR shall interrupt the WORK when necessary to allow testing, including sampling to be performed. The CONTRACTOR shall have no claim for an increase in Contract Price or Contract Times due to such interruption. When testing activities, including sampling, are performed in the field by the testing firm's laboratory personnel, furnish personnel and facilities to assist in the activities.

H. **Transmittal of Test Reports:** Written reports of tests and engineering data furnished by the CONTRACTOR for the DISTRICT's review of materials and equipment proposed to be used in the WORK shall be submitted as indicated for Shop Drawings.

1. The testing firm retained by the CONTRACTOR for material testing shall furnish five copies of written report of each test. Four copies of each test report shall be transmitted to the DISTRICT within 3 days after each test is completed. Each report for each type of test shall be consecutively numbered.

2. The DISTRICT shall furnish one copy of each field and laboratory QC test performed by the DISTRICT to the CONTRACTOR.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01450
PERMITS

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall obtain permits required for the execution of the WORK in accordance with the Contract Documents. Copies of these permits shall be furnished to the DISTRICT.

1.2 PERMITS OBTAINED BY THE DISTRICT

A. None

1.3 PERMITS OBTAINED BY THE CONTRACTOR

A. The CONTRACTOR shall obtain any and all other permits required for the prosecution of the WORK.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01505
MOBILIZATION

PART 1 – GENERAL

1.1 GENERAL

A. Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items at the project site.

B. The CONTRACTOR shall maintain on the project site a suitable office or other protected area in which shall be kept copies of Contract Documents, project progress records, etc., which shall be accessible to the DISTRICT during normal working hours.

1.2 CONSTRUCTION UTILITIES

A. Water will be furnished free of charge to the CONTRACTOR, in reasonable quantities, for the CONTRACTOR'S use during the WORK. The DISTRICT shall make water available at the following locations:

1. The DISTRICT will allow the CONTRACTOR to draw water from the fire hydrants listed below near the areas of Work. The exact hydrants to be used shall be determined at the pre-construction conference. The CONTRACTOR shall be responsible for conveying water from one of these fire hydrants to the Project Site.

    a. Low pressure hydrant at the project site, as long as they are in service.

2. Water shall be taken from fire hydrants into water trucks, holding tanks or similar vessels for later use by construction activities. The CONTRACTOR shall not draw water directly from fire hydrants for use in construction activities.

B. Electricity is not currently available at any of the areas of Work. The CONTRACTOR may, at the CONTRACTOR'S expense, apply for and construct temporary construction electrical service.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01520
SECURITY

PART 1 – GENERAL

1.1 SECURITY PROGRAM

A. The CONTRACTOR shall protect the WORK from theft, vandalism, and unauthorized entry.

B. The CONTRACTOR shall restrict entry of persons and vehicles into Site.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01530
PROTECTION OF EXISTING UTILITIES

PART 1 – GENERAL

1.1 GENERAL

A. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, in accordance with the Contract Documents.

B. Material shown on the plans or designated in these Specifications that is to be salvaged or used in reconstruction work, and which has been damaged or destroyed as a result of the CONTRACTOR'S operations, shall be repaired or replaced by the CONTRACTOR at no additional cost to the DISTRICT.

C. The CONTRACTOR shall verify the exact locations and depths of all utilities indicated and make exploratory excavations of all utilities that may interfere with the WORK. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR's work.

D. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

E. The CONTRACTOR shall call the Underground Service Alert (USA) 48 hours prior to commencing any digging for location of underground utility lines and cable location. The number is (800) 642-2444.

1.2 RIGHTS-OF-WAY

A. The CONTRACTOR shall not perform any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor enter upon the rights-of-way involved until notified that the DISTRICT has secured authority therefor from the proper party. After authority has been obtained, the CONTRACTOR shall give said party due notice of its intention to begin work, if required by said party, and remove, shore, support or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace the same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the DISTRICT shall determine the sequence and order of the WORK. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the DISTRICT to the contractor so desiring, to the extent, amount, in the manner, and at the times permitted. No such decision as to the method or time of conducting the WORK or the use of territory shall be made the basis of any claim for delay or damage.

1.3 PROTECTION OF STREET OR ROADWAY MARKERS

A. The CONTRACTOR shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization.

No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced. All survey markers or points disturbed by the CONTRACTOR shall be accurately replaced after all street or roadway resurfacing has been completed.

1.4 RESTORATION OF PAVEMENT

A. **General:** All paved areas including asphaltic concrete beams cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing a permit. All temporary and permanent pavement shall conform to the requirements of the affected jurisdictional agency. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.

B. **Temporary Resurfacing:** Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. **Permanent Resurfacing:** In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

D. **Restoration of Sidewalks or Private Driveways:** Wherever sidewalks or private roads have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or roadways promptly after backfilling and maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

1.5 EXISTING UTILITIES AND IMPROVEMENTS

A. General:

1. The CONTRACTOR shall protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by its construction operations. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences, and other surface structures affected by construction operations, shall be restored to their original condition, whether within or outside the easement. All replacements shall be made with new materials.

2. It shall be the CONTRACTOR's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The CONTRACTOR shall take all possible precautions for the protection of

unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

B. **Right of Access:** The right is reserved to the DISTRICT and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the WORK of these Contract Documents.

C. **Underground Utilities Indicated:** Existing utility lines that are indicated or the locations of which are made known to the CONTRACTOR prior to excavation and that are to be retained, and all utility lines that are constructed during this project shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the CONTRACTOR.

D. **Underground Utilities Not Indicated:** The CONTRACTOR is hereby notified of the possible existence of underground facilities not known to the DISTRICT or in a location different from that designated on the plans. If the CONTRACTOR encounters or has evidence of existence of an underground utility not shown on the plans or marked on the ground, the CONTRACTOR shall:

1. Ascertain the exact location of said underground utility.

2. Immediately notify the DISTRICT and follow up with written notification to the DISTRICT.

3. Proceed with work in another work area, if possible, until the DISTRICT directs a course of action. Where it is determined by the DISTRICT that the rearrangement or repair of an underground utility, the existence of which is not shown on the plans, is essential in order to accommodate the improvements being constructed, the DISTRICT will provide for the rearrangement or repair of such facility by other forces or such rearrangement or repair shall be performed by the CONTRACTOR and will be paid for as extra work. An extension of time may be granted for delays in connection with this work described herein and for extra work performed by the CONTRACTOR.

E. The CONTRACTOR shall cooperate with the DISTRICT to investigate possible damage of existing underground utilities suspected as a result of the CONTRACTOR's operations. The CONTRACTOR shall take such measures as necessary to physically prove to the satisfaction of the DISTRICT that the existing utilities are unharmed or adequately repaired at such locations where the DISTRICT has reasonable suspicion that damage has occurred. If said utilities are found to be undamaged by the CONTRACTOR's operations, the cost of only the uncovering and backfill ordered by the DISTRICT shall, by appropriate change order, be paid by the DISTRICT:

F. Damages:

1. All costs of locating and/or repairing damage not due to failure of the CONTRACTOR to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the WORK which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such Work will be paid for as Extra Work in accordance with the provisions of the Contract Documents.

2. The CONTRACTOR shall be responsible for all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges, and other public or private property, regardless of location or character, which may be caused by transporting equipment, materials, or personnel to or from the Work or any part or Site thereof, whether by him or his Subcontractors. The CONTRACTOR shall make satisfactory and acceptable arrangements with the owner of, or the agency or authority having jurisdiction over, the damaged property concerning its repair or replacement or payment of costs incurred in connection with the damage.

G. **Approval of Repairs:** All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement or the DISTRICT, before being concealed by backfill or other work.

H. **Fire Hydrants:** All fire hydrants and water control valves shall be kept free from obstruction and available for use at all times.

I. **Maintenance of Service:** All oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered during the WORK shall remain continuously in service, unless other arrangements satisfactory to the DISTRICT are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The CONTRACTOR shall be responsible for and shall repair all damage due to its operations, and the provisions of this section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

J. Should the CONTRACTOR desire to have any rearrangement made in any utility, for its convenience in order to make easier its construction operations, which arrangement is in addition to, or different from the rearrangement indicated in the Drawings, the CONTRACTOR shall make whatever preparations are necessary with the owner of the utility for such arrangement and bear all expenses in connection therewith.

K. During construction, the CONTRACTOR may find it necessary to remove, obstruct or modify such existing facilities as fences, culverts, sidewalks, and small structures. It shall be the CONTRACTOR'S responsibility to obtain permission of the owner of such facility, and subsequently return it to the condition in which it was found or better.

L. The CONTRACTOR shall not, at any time, operate any existing valves, hydrants, blowoffs or other components within the DISTRICT's potable water system without written authorization from the DISTRICT. In the event of an emergency, the CONTRACTOR shall contact the DISTRICT to have DISTRICT employee's respond to the emergency condition. This requirement shall not prevent the CONTRACTOR from properly testing and ensuring that facilities installed under this Contract are properly functioning.

1.6 UNFAVORABLE CONSTRUCTION CONDITIONS

A. During unfavorable weather, wet ground, or other unsuitable construction conditions, the CONTRACTOR shall confine operations to WORK that will not be affected adversely by such conditions. No portion of the WORK shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless

special means or precautions are taken by CONTRACTOR to perform the WORK in a proper and satisfactory manner.

1.7 DAMAGE TO EXISTING PROPERTY

A. The CONTRACTOR will be held responsible for any damage to existing structures, WORK, materials, or equipment because of his operations and shall repair or replace any damaged structures, Work, materials, or equipment to the satisfaction of, and at no additional cost to, the DISTRICT.

B. The CONTRACTOR shall protect all existing structures and property from damage and shall provide bracing, shoring, or other Work necessary for such protection.

C. The CONTRACTOR shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or personnel to or from the Work. Make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

1.8 NOTIFICATION BY THE CONTRACTOR

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the CONTRACTOR shall notify the owners or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said owner or agencies can be present during such Work if they so desire.

B. When it is necessary to temporarily deny access to property, or when any utility service connection must be interrupted, the CONTRACTOR shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.

C. The CONTRACTOR shall post a notice to the public in the local weekly newspaper advising the public of the project boundaries including a scale map showing the project area and suggested detour routes, the project time limits, the CONTRACTOR's name, and the need to be alert for construction signs and traffic control. The notice, dimensioned 3-inches x 5-inches minimum, shall appear in the two weekly issues prior to the start of the WORK.

D. The CONTRACTOR shall contact, cooperate with, and provide written notice (including the CONTRACTOR's phone number) at least 7 days prior to beginning WORK on each street. The written notice shall include the approximate schedule and explanation of WORK and shall be given to each homeowner, business, all emergency agencies, schools, and residents which will be affected by the project; particularly in reference to temporary interruptions to vehicular access. At least 24 hours prior to initiation of WORK, a second notice shall confirm the scope of scheduled WORK. A copy of the notifications shall be submitted to the DISTRICT, for approval, prior to the start of construction. Verbal door-to-door communication shall be made prior to construction to

remind all affected parties of the construction to take place. In addition, CONTRACTOR is responsible to answer and resolve any conflicts that may arise between a homeowner or business owner and himself during the construction process. CONTRACTOR shall be responsible to maintain adequate dust control measures and to protect the private property along the roadway construction.

E. The CONTRACTOR shall maintain a written record of all notices, along with names, addresses and dates of distribution. Copies of the record shall be provided to the DISTRICT at the time notices are distributed.

F. The CONTRACTOR shall minimize interaction with the public and media. The CONTRACTOR shall refer questions and comments from the public or media to the DISTRICT's representative (Mr. Neil Kaufman, 530-582-3950). This requirement shall not nullify CONTRACTOR's responsibility to notify impacted residents or businesses.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01540
TRAFFIC CONTROL

PART 1 – GENERAL

1.1 GENERAL

A. For the protection of traffic in public or private streets and ways, the CONTRACTOR shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of the latest revision of the California Manual on Uniform Traffic Control Devices, published by the California Department of Transportation.

B. The CONTRACTOR shall take all necessary precautions for the protection of the Work and the safety of the public. Barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The CONTRACTOR shall station such guards or flagmen and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. Signs, signals, and barricades shall conform to the requirements of Cal- OSHA and Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.

C. Prior to commencing construction, the CONTRACTOR shall submit a traffic control plan to the Town of Truckee, Nevada County, or Placer County, as appropriate. Construction within public right-of-ways shall not commence without the required approvals. The governing agency shall be allowed access to observe these traffic control plans in use and to make any changes as field conditions warrant. Any changes shall supersede these plans and be done solely at the CONTRACTOR's expense.

D. The CONTRACTOR shall maintain existing “STOP” signs, street signs and guide signs at all times. If necessary, signs shall be set in temporary locations to ensure visibility by motorists and pedestrians.

E. The CONTRACTOR shall remove traffic control devices when no longer needed, repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

1.2 WARNING SIGNS

A. Prior to construction within the public right-of-way, the contractor shall install W20-1 signs in accordance with Part 5 of the California Manual on Uniform Traffic Control Devices. The signs shall be professionally made with a minimum size of 36 inches. The signs shall be replaced or repaired if damaged or stolen. The placement, type and location of all traffic control devices shall be subject to review and approval by the appropriate governing agency.

1.3 TRAFFIC CONTROL REQUIREMENTS

A. CONTRACTOR shall maintain at least one 12-foot travel lane on all improved streets during construction.

1. The CONTRACTOR is required to maintain pedestrian access (sidewalks) to all residences in the construction zone; providing alternate pedestrian routes when necessary; maintain vehicle access for emergency vehicles, fire trucks, ambulances, and police vehicles; provide barricades, and flagmen as necessary while working all areas; and in particular, at intersections on the project; complete roadway delineation within five days of pavement completion. Ditch openings which isolate businesses, schools, and other areas shall be provided with an approved bridge system capable of withstanding traffic loads to these areas. No road or business driveway may be closed without the approval of DISTRICT unless the CONTRACTOR has received written authorization from the party affected.

2. Prior to the date set for the preconstruction conference, the CONTRACTOR shall submit a Traffic Control Plan to the appropriate governing agencies. The plan shall address traffic control during each portion of the WORK. Construction activities within public rights-of-way shall not commence until the Traffic Control Plan has been approved.

3. The profile grades of all temporary driveway access, both commercial and residential, shall be such that a compact vehicle will not “bottom-out” at a speed of five miles per hour.

B. Pedestrian traffic and access must be maintained at all times. When the CONTRACTOR’s construction operations encroach upon a sidewalk, walkway, or crosswalk area, the CONTRACTOR shall take special precautions to protect the pedestrian’s safety, including provisions to separate pedestrian traffic from the Work area and vehicular traffic. When pedestrian traffic is routed onto the roadway, at other than at existing crosswalk locations, the CONTRACTOR shall use portable precast concrete barrier rails to separate the pedestrian traffic from the Work area and vehicular traffic.

1. The CONTRACTOR shall conduct its activities to accommodate mail delivery, refuse collection, school busing, and all other regularly scheduled services within the project area.

2. The CONTRACTOR shall be responsible for the public’s safety in relation to the job. If any situation is found or deemed to be unsafe, the CONTRACTOR shall take appropriate measures to improve the situation and make it safe.

3. The CONTRACTOR shall not shut off the utility supply to any residence, or hydrant, nor in any way prevent access to a fire hydrant prior to securing permission to do so from the proper authorities.

C. **Traffic Signal Interruption:** When the scheduled Work requires altering, in any way, the number or alignment of the travel lanes entering a signalized intersection, the CONTRACTOR shall, no less than 24 hours in advance of implementing the changes, notify the governing agency.

1.4 FLAGMEN

A. When required for public safety, the CONTRACTOR shall provide and station competent flagmen whose sole purpose shall be to direct the movement of public traffic either through or around the Work.

B. Proper advance warning signs shall be in place when flagmen are working and removed when Work requiring flagmen is completed.

C. Flagmen must be used to assist trucks for safe ingress and egress whenever truck movements may interfere with safe passage through the Work zone. The flagmen's first priority shall be to maintain the safe and efficient movement of the public traffic. Flagmen shall not be used to direct public and/or construction traffic into and through the signalized or stop sign controlled intersections nor shall they cover or alter any regulatory devices.

1.5 TRAFFIC CONTROL DEVICES

A. All traffic control devices that are not in use or will not be used for a period greater than 24 hours shall be removed by the CONTRACTOR from the public right-of-way. All traffic control devices that are determined by the DISTRICT to be unnecessary, confusing, or causing an unsafe condition, shall be removed by the CONTRACTOR from the public right-of-way immediately upon written notification by the DISTRICT. The CONTRACTOR shall not use the sidewalk area to store unused barricades unless the sidewalk is closed and an approved barricade plan is provided for rerouting the pedestrians.

B. The CONTRACTOR shall maintain all barricades and other traffic control devices in clean and effective condition. The CONTRACTOR shall replace poorly maintained devices immediately upon notification by the DISTRICT.

C. The CONTRACTOR shall immediately reinstall any traffic signs removed during the course of construction. Any signs that are lost or damaged shall be replaced or repaired at no additional cost to the DISTRICT.

D. The CONTRACTOR shall remove all road markings, pavement markers, and other delineation that conflicts with the safe flow of traffic and the CONTRACTOR'S approved traffic control plans. All such items shall be restored prior to Final Completion of the project.

E. The CONTRACTOR shall provide temporary traffic striping, if existing delineation is destroyed during trenching or other Work. Painted markings or striping tape may be used. Temporary striping must be approved for material and layout by the appropriate governing agency. All temporary painted markings shall be removed by sandblasting prior to Final Completion of the project.

1.6 AUTHORITY OF THE TOWN OF TRUCKEE

A. When performing Work within Town of Truckee right-of-ways, the CONTRACTOR shall comply with the approved traffic control plan. The Town shall be allowed access to any project location within Town of Truckee right-of-ways. The Town shall have the authority to order changes to the approved traffic control plan as field conditions warrant. Such changes may include, but are not limited to placement of additional warning signs, cones and delineators; relocation of warning signs, cones delineators; or requiring additional flagmen. The CONTRACTOR shall comply with changes ordered by the Town at no additional cost to the DISTRICT.

B. The authority of the Town to order changes to the Work is expressly limited to issues of traffic control and public safety **ONLY**. Any other changes requested by the Town, such as changes in materials, alignment or working methods shall be referred to the DISTRICT. Any changes to the Work made by the CONTRACTOR, without direction by the DISTRICT, shall be subject to removal and reinstallation at no additional cost to the DISTRICT.

1.7 STANDARD TRAFFIC CONTROL PLANS

A. Included at the end of this Section, for reference are copies of standard traffic control plans prepared by the California Department of Transportation. The CONTRACTOR may use these plans for reference when preparing its traffic control plan to the appropriate governing agency.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01550
SITE ACCESS AND STORAGE

PART 1 – GENERAL

1.1 HIGHWAY LIMITATIONS

A. The CONTRACTOR shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the WORK. It shall be the CONTRACTOR's responsibility to construct and maintain any haul roads required for its construction operations.

1.2 TEMPORARY CROSSINGS

A. **General**: Continuous, unobstructed, safe, and adequate pedestrian and vehicular access shall be provided to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, and hospitals. Safe and adequate public transportation stops and pedestrian crossings at intervals not exceeding 300 feet shall be provided. The CONTRACTOR shall cooperate with parties involved in the delivery of mail and removal of trash and garbage so as to maintain existing schedules for such services. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time.

B. **Temporary Bridges**: Wherever necessary, the CONTRACTOR shall provide suitable temporary bridges or steel plates over unfilled excavations, except in such cases as the CONTRACTOR shall secure the written consent of the responsible individuals or authorities to omit such temporary bridges or steel plates, which written consent shall be delivered to the DISTRICT prior to excavation. All such bridges or steel plates shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the CONTRACTOR shall adopt designs furnished by said authority for such bridges or steel plates, or shall submit designs to said authority for approval, as may be required.

1.3 PUBLIC ACCESS

A. **Street Use:** Nothing herein shall be construed to entitle the CONTRACTOR to the exclusive use of any public street, alleyway, or parking area during the performance of the WORK hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of the DISTRICT and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise indicated. Toe boards shall be provided to retain excavated material if required by the DISTRICT or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the WORK shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the CONTRACTOR to assure the use of sidewalks and the proper functioning of all gutters, storm drain inlets, and other drainage facilities.

B. **Temporary Street Closure:** If closure of any street is required during construction, the CONTRACTOR shall apply in writing to the governing agency or agencies at least 30 days in advance of the required closure.

C. **Temporary Driveway Closure**: The CONTRACTOR shall notify the owner or occupant (if not owner-occupied) of the closure of the driveways to be closed more than one eight-hour work day at least 3 working days prior to the closure. The CONTRACTOR shall minimize the inconvenience and minimize the time period that the driveways will be closed. The CONTRACTOR shall fully explain to the owner/occupant how long the work will take and when closure is to start.

1.4 NOTIFICATION OF LOCAL AGENCIES AND UTILITIES

A. The CONTRACTOR shall notify the Town of Truckee, Nevada County, the California Department of Transportation, the Truckee Fire Protection District, Tahoe-Truckee Unified School District, Tahoe Truckee Sierra Disposal Company, Nevada County Sheriff Department and California Highway Patrol of its construction operations at least two days prior to commencing work. The CONTRACTOR shall cooperate with local authorities relative to traffic movement in the construction area.

1.5 CONTRACTOR'S WORK AND STORAGE AREA

A. The CONTRACTOR may utilize the project site and adjacent areas for storage of equipment and materials, including soil and backfill materials. Should the CONTRACTOR elect to utilize this area for the storage of soil materials, the CONTRACTOR shall be responsible to install and maintain suitable environmental controls such as silt fencing to the DISTRICT'S satisfaction. The CONTRACTOR shall be responsible to repair and/or replace any pavement damaged by the CONTRACTOR's operations. CONTRACTOR shall limit their operations to the DISTRICT property only.

B. There are a number of existing trees in the project area. The CONTRACTOR may not remove any trees other than those indicated on the plans, and shall conduct its operations with care to protect these trees from damage. The CONTRACTOR shall limit its operations to property owned by the DISTRICT.

C. Should the existing work area prove insufficient, the CONTRACTOR shall make its own arrangements for any additional off-site storage or shop areas necessary for the proper execution of the WORK. The CONTRACTOR shall take precautions to protect stored materials. Construction materials shall not be stored in such a manner as to be a hazard to traffic or to the public in general.

1.6 SITE STORAGE LIMITATIONS

A. To the maximum extent possible, equipment shall be re-fueled, washed, and serviced at the pump station site, or off-site.

1.7 PARKING

A. The CONTRACTOR shall direct its employees to park in such a manner that complies with the requirements of the local governing agency.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01560
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 – GENERAL

1.1 EXPLOSIVES AND BLASTING

A. The use of explosives on the WORK shall be permitted only upon expressed written consent of the DISTRICT.

B. Blasting operations shall conform to all federal, state, and local ordinances, regulations and requirements. Blasting shall only be done by appropriately certified personnel. All blasting materials shall be secured so as to prevent loss by theft or vandalism. The use of explosives shall be controlled by consideration of safety of the public.

C. Blasting Procedures:

1. General

a. Blasting and storage and handling of explosives shall be in accordance with the Construction Safety Orders of the Division of Industrial Safety of the California Department of Industrial Relations, and other authorities which have jurisdiction.

b. The CONTRACTOR shall pay the cost of obtaining any required blasting permits.

c. Blasting shall be done only by skilled operators under the direction of a licensed foreman.

d. The CONTRACTOR shall identify all property, structures, and persons which may be affected by blasting and shall take all safety precautions and protective measures to prevent damage or injury to same. All personal injury or damage to persons or property of any nature, whether in the WORK or appurtenant to it, shall be the responsibility of the CONTRACTOR.

e. The CONTRACTOR agrees by submission of a bid to indemnify and hold the DISTRICT, its officers, agents, and employees harmless from any and all liability claims, costs, expenses including expenses of investigation and defending against same in regard thereto.

f. Blasting shall only be permitted between 7:00 AM and 6:00 PM, Monday through Friday, unless otherwise approved by the DISTRICT and regulatory agencies having jurisdiction. Blasting will not be permitted on weekends or legal holidays.

2. Pre-Blasting

a. Inspections of all structures within 300-feet of the blast site shall be made no more than 2 weeks prior to commencement of blasting. Such

inspections shall be videotaped to provide documentation of any visible or reasonable recognizable pre-existing defects or damages in structures.

b. Complete inspection reports listing findings with videotapes shall be submitted to the DISTRICT before blasting commences.

c. The CONTRACTOR shall provide notice to all residences, businesses, and utility owners which may be affected by blasting. Such notices shall be provided at the start of the project and shall be repeated weekly until completion of all excavation work.

3. Blasting

a. Fly rock from blasting shall be contained within the project site and shall not represent a hazard to persons, vehicles, existing improvements, or vegetation.

b. The blasting site shall be cleaned of all debris at the end of each day.

c. No blasting shall be done within 100-feet of concrete which has been placed less than 7 days, except by permission of the DISTRICT.

4. Post-Blasting

a. The CONTRACTOR shall investigate each complaint of property damage and a written report shall be furnished to the DISTRICT within 30 days of receipt of the complaint.

1.2 DUST ABATEMENT

A. The CONTRACTOR shall furnish all labor, equipment, and means required and carry out effective dust control measures wherever and as often as necessary to prevent CONTRACTOR's operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The CONTRACTOR shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the CONTRACTOR is relieved of further responsibility by the DISTRICT.

B. The CONTRACTOR shall water active construction sites and unpaved roads as necessary to control dust.

C. If the CONTRACTOR cannot maintain effective dust control under windy conditions, the CONTRACTOR shall temporarily suspend all excavating and grading operations.

D. If watering of unpaved roads is not sufficient to control dust, the CONTRACTOR shall reduce vehicle speeds to 15 mph or less on unpaved roads.

E. The CONTRACTOR shall comply with all requirements of Rule 226 as adopted by the Northern Sierra Air Quality Management District. A copy of this rule is included at the end of this section.

1.3 RUBBISH CONTROL

A. The CONTRACTOR shall prepare a trash abatement program and submit to DISTRICT for review and approval. The program shall include placing all litter, trash, and garbage in scavenger-proof, resealable containers. Trash includes, but is not limited to, cigarettes, cigars, gum wrappers, tissue, cans, paper, and bags. During the progress of the WORK, the CONTRACTOR shall keep the Site of the Work and other areas used by the CONTRACTOR in a neat and clean condition, and free from any accumulation of rubbish. The CONTRACTOR shall dispose of all rubbish and waste materials of any nature occurring at the Site, and establish regular intervals of collection and disposal of such materials and waste. The CONTRACTOR shall keep haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the Site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

B. The CONTRACTOR shall clean up and properly dispose of any oil, fuel, and other equipment leaks at the time of occurrence. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks and spills. The CONTRACTOR shall notify the DISTRICT of any spills or leaks at the time of occurrence.

1.4 SANITATION

A. **Toilet Facilities:** Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.

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

1.5 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether soil sterilant, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

B. Herbicides, pesticides, and SDWA regulated compounds shall not be used unless prior approval is obtained. If CONTRACTOR decides that herbicides are needed, the CONTRACTOR shall obtain written approval to use the herbicide from the proper regulatory agencies. Copies of the documents approving such usage shall be submitted to the DISTRICT a minimum of three working days prior to their application.

1.6 FIRE PREVENTION

A. **Fire Reporting:** There shall be readily available telephone service to the Site of the WORK. Appropriate telephone numbers shall be conspicuously posted near each telephone. Instructions shall be issued to notify the proper authorities immediately in case of fire.

B. Access for Fire Fighting

1. Every building adjacent to the WORK shall be accessible to fire department apparatus by way of access roadways.

2. Access roadways shall not be obstructed in any manner, including parking vehicles. “No Parking” signs or other appropriate notice, or both, prohibiting obstruction may be required.

3. Access for use of heavy fire fighting equipment shall be provided to the immediate job site at the start of the Contract and maintained until completion.

C. General Fire Prevention Provisions:

1. **Smoking:** Smoking shall be prohibited at all time in the underground excavations and at or in the vicinity of hazardous operations or combustible/flammable materials. “No Smoking” signs shall be posted in these areas.

2. **Refueling:** Special care shall be taken to prevent fires when refueling equipment.

3. **Oil Filters, Cartridges, and Oily Rags:** Used and discarded oil filters, cartridges, and oil rags or waste shall be removed from the Site and disposed of properly.

4. **Storage of Flammables:** Glass jugs or bottles shall not be used as storage containers for flammable materials. Gasoline, oil, grease, and other highly flammable materials shall be stored either in a separate building, or at a site where all debris is cleared within a radius of 25 feet. Storage buildings or sites shall be a minimum distance of 50 feet from other structures. Storage buildings shall be adequately posted with highly visible signs to warn of the flammables and to prohibit smoking in or around the buildings.

1.7 CULTURAL RESOURCES

A. The DISTRICT has developed a flexible on-site/on-call agreement with a qualified archaeologist that will be empowered to redirect construction activities away from any cultural resources discovery. In the event that subsurface archaeological features or materials are exposed during any phase of project activities, all work in the immediate vicinity of the find shall halt until the qualified archaeologist has assessed the site and the significance of the resource has been evaluated. The District will coordinate any findings with the appropriate state, federal, and tribal entities according to standard reporting procedures. Any mitigation measures that may be deemed necessary shall be implemented by a qualified archaeologist representing the DISTRICT prior to the resumption of construction activities.

B. The CONTRACTOR's attention is directed to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800 which provide for the preservation of potential historical architectural, archaeological, or cultural resources (hereinafter called "cultural resources").

C. The CONTRACTOR shall conform to the applicable requirements of the National Historic Preservation Act of 1966 as it relates to the preservation of cultural resources.

D. In the event potential cultural resources are discovered during subsurface excavations at the Site of construction, the following procedures shall be instituted:

1. The DISTRICT shall issue a Field Order directing the CONTRACTOR to cease all construction operations at the location of such potential cultural resources find. The area shall be marked by the CONTRACTOR in an appropriate manner to ensure that all construction equipment, activities, and personnel remain clear of the area until further notice.

2. The DISTRICT shall retain a qualified archaeologist to evaluate the find, and determine if any additional mitigation is required. The DISTRICT shall implement any required study or removal. The DISTRICT shall notify the CONTRACTOR when the mitigation is complete and construction in the affected area can resume.

E. If human remains are exposed by project-related activity, the DISTRICT and the CONTRACTOR shall comply with California Health and Safety Code Section 7050.5, which states that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to California Public Resources Code Section 5097.98. The DISTRICT and CONTRACTOR shall provide the opportunity for (a) Native American monitor(s) to participate in the identification, evaluation, and mitigation of effects upon, any Native American human remains or cultural resources inadvertently exposed during the proposed undertaking. Continued consultation with personnel designated by the Washoe Tribe of Nevada and California would be acceptable. Should the tribal representatives agree to consult on any such discoveries, the costs incurred shall be the responsibility of the DISTRICT.

1.8 AIR QUALITY

A. The CONTRACTOR shall maintain all vehicles and equipment in proper tune.

B. The CONTRACTOR shall use Best Available Control Technology on construction equipment, including a timing retardation.

C. The CONTRACTOR shall use natural-gas powered construction equipment where possible.

D. The CONTRACTOR shall encourage employee car-pooling.

E. The CONTRACTOR shall comply with all air pollution control rules, regulations, ordinances and statutes that apply to the work area. The Northern Sierra Air Quality Management District can be contacted at telephone 530-274-9360.

1.9 NOISE

A. The CONTRACTOR shall comply with the hours of WORK as allowed by the local jurisdiction.

B. The CONTRACTOR shall comply with all sound control and noise level rules, regulations and ordinances. The CONTRACTOR shall comply with the Town of Truckee Title 18, Development Code, Chapter 18.44.

C. All construction equipment shall be equipped with manufacturer's standard noise control devices (i.e., mufflers, acoustical lagging, and/or engineer enclosures). The CONTRACTOR shall take special care not to throttle the engine excessively and shall keep engine speed as low as possible. The CONTRACTOR shall not leave equipment running or idling needlessly, especially when near noise-sensitive land uses. Noise sensitive land uses include, but are not limited to, residences, schools, hospitals, libraries, retirement and elderly care centers, religious and worship facilities, courts of law, certain noise-sensitive professional offices, and quiet recreational areas such as campgrounds and hiking trails.

D. The CONTRACTOR shall use newer equipment whenever possible. The CONTRACTOR shall inspect all construction equipment at periodic intervals to ensure proper maintenance and the presence of noise control devices (i.e., mufflers and shrouding, etc.).

E. The CONTRACTOR shall locate stationary noisy equipment away from construction boundaries that are near noise-sensitive land uses.

F. If dewatering pumps and generators are required to be operated between the hours of 6 p.m. and 7 a.m. within 600 feet of a noise-sensitive land use, they shall be treated with acoustical noise control measures (e.g., mufflers, shrouding, and/or enclosures) to comply with the appropriate requirements of the local jurisdiction.

G. If requested by the DISTRICT, the CONTRACTOR shall install temporary noise barriers for construction activities, including staging areas that occur closer than 100 feet from noise-sensitive land uses. Noise barriers can be made of plywood, heavy vinyl curtain material, natural or temporary earth berms, or stockpiles of construction material.

1.10 DISPOSAL OF WATER FROM DEWATERING, FLUSHING AND DISINFECTION

A. The CONTRACTOR shall not, at any time, discharge water from construction activities directly to the environment.

B. The DISTRICT has not obtained a permit to allow discharges to the sanitary sewer under this Contract.

C. Water used for flushing and disinfecting of the new pipeline shall be disposed of at the detention basin identified in Section 02643 – Water Pipeline Testing and Disinfection.

D. If groundwater is encountered during construction, the CONTRACTOR shall pipe the water from its dewatering pumps directly into tanker trucks. Water from trench dewatering shall not be discharged to the sanitary sewer.

1.11 SPILL CONTAINMENT

A. The CONTRACTOR shall exercise every reasonable precaution to protect streams, lakes, reservoirs, bays and the public water supply from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials.

B. The CONTRACTOR shall have on-site, at all times, materials and equipment to contain any spill of gasoline, diesel fuel or other hazardous substances. Any such spills shall be prevented from reaching any surface water bodies. Furthermore, in the event of a spill, the appropriate public agencies shall be contacted to ensure proper clean-up and documentation of the spill incident.

1.12 EROSION CONTROL

A. The CONTRACTOR shall conduct and schedule his operations so as to avoid muddying and silting any waterways or drainage ditches. Care shall be exercised to preserve roadside vegetation beyond the limits of construction.

B. The CONTRACTOR shall implement erosion control measures to prevent the erosion and transport of sediment from the Project site. Silt fencing, straw bales, straw waddles and other similar measures shall be placed as required to accomplish this objective. The CONTRACTOR shall inspect and maintain all erosion control measures throughout the duration of the Work on a daily basis.

C. Excavated materials and imported material stockpiles shall not be placed directly on top of existing vegetation. Materials may be placed on paved areas, on sheets of fiber reinforced plastic, or may be placed directly into trucks for removal from the site for proper disposal. To the maximum extent possible stockpiles shall be on the uphill side of trenches and excavations.

D. Established drainage ditches disturbed by the CONTRACTOR'S operations shall be graded to their original dimensions and slopes. The CONTRACTOR shall then install a three-dimensional woven geotextile specifically designed for erosion control in vegetated drainage ditches. The geotextile shall cover the sloped sides and bottom of the ditch disturbed by trench excavation. Installation of the geotextile shall be according to the manufacturer's instructions. Drainage ditches shall then be seeded in accordance with Section 02900 – Site Revegetation.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

RULE 226 - DUST CONTROL

PART 1.0 GENERAL

1.1 Purpose:

The purpose of this rule is to reduce and control fugitive dust emissions to the atmosphere.

1.2 Applicability:

This rule shall apply to any person engaged in:

a. Dismantling or demolition of buildings
b. Public or Private Construction
c. Mining
d. Processing of solid bulk materials (i.e., sand, gravel, rock, dirt, sawdust, ash, etc.)
e. Operation of machines or equipment
f. Operation and use of unpaved parking facilities
g. Operation and use of livestock and/or horse arenas
h. Operation of feed lots
i. Operation and use of raceways for animals or motor vehicles.

1.3 Exemptions:

The requirements set forth in Part 3.0 - Standards do not apply to commercial agricultural operations.

PART 2.0 DEFINITIONS

Bulk Materials: Any unpackaged material which emits dust when stored or handled (i.e., dirt, sand, gravel, sawdust, ash, rock, etc.).

Chemical Soil Stabilization/Suppression: A means of dust control implemented by any person to mitigate PM 10 emissions by applying petroleum resins, asphaltic emulsions, acrylics, adhesives, or any other approved materials.

Construction Site: A site on which construction, demolition, or related activities occur, including, but not limited to, land clearing, excavation related to construction, land leveling, grading, cut and fill grading, and the erection or demolition of a structure. As used in this Rule, a construction site may encompass several contiguous parcels, or may encompass only a portion of one parcel, depending on the relationship of the property boundaries to the actual construction activities.

Disturbed Area: An area in which soils have been disturbed by grading, land leveling, scraping, cut and fill activities, excavation, brush and timber clearing, grubbing, and soils on which vehicle operation has occurred.

Dust Suppressants: Water, hygroscopic materials, chemical stabilization palliatives and suppression materials, and other approved substances.

Fugitive Dust: The particulate matter entrained in the ambient air which is caused from man-made and natural activities which is emitted into the air without first passing through a stack or duct designed to control flow, including, but not limited to, emissions caused by movement of soil, vehicles, equipment, and wind blown dust. This excluded particulate matter emitted directly in the exhaust of motor vehicles, from other fuel combustion

devices, portable brazing, soldering, or welding equipment, and from pile drivers.

Hygroscopic Materials: Any material that is readily capable of absorbing moisture from the air.

Land Preparation: Any preparation of land for anthropogenic (human) purposes, including brush or timber clearing, grubbing, scraping, ground excavation, land leveling, or grading.

Operation: Any activity, process, or project described in the applicability sections of the Rules of this Regulation.

Owner/Operator: Includes, but is not limited to, any person who leases, supervises, or operates equipment, in addition to the normal meaning of owner or operator.

Palliative: Any dust control agent used to lessen or reduce dust emissions.

Particulate Matter: Any material emitted or entrained into the air as liquid or solid particulates, with the exception of uncombined water. For PM-10, refer to Definition).

Paved Roads: An improved street, highway, alley, public way, or easement that is covered by concrete, asphaltic concrete, asphalt, or other materials which provide a permanent stable surface.

Person: Any individual, public and private corporation, government agency, partnership, association, firm, trust, estate, or any other legal entity which is recognized by law as the subject of rights and duties.

PM-10: Particulate matter with an aerodynamic diameter smaller than or equal to a nominal ten (10) microns as measured by the applicable State and Federal reference test methods.

Reasonably Available Control Measures: Techniques used to limit the emission and/or airborne transport of fugitive dust from a site including: application of water, chemical stabilizers/suppressants, soil stabilizers, or other liquids, covering, paving, enclosing, shrouding, compacting, planting, cleaning, or such other measures the Air Pollution Control Officer may approve to accomplish satisfactory results for temporary and/or extended suppression of PM-10 emissions.

Road: Any paved or unpaved, public or private street, highway, freeway, alley way, access drive, access easement, haul road, or driveway.

Site: Real property or land used or set aside for any specific use.

Unpaved Roads: An open way that is not covered by one of the materials described in the paved road definition.

Vehicle: Any device by which any person or property may be propelled, moved, or drawn, excepting aircraft or watercraft or devices moved exclusively by human or animal power or used exclusively upon rails or tracks.

Visible Dust Emission: Visible dust of such opacity as to obscure an observer's view to a degree equal to or greater than an opacity of 20%, for a

period or periods aggregating more than three (3) minutes in any one (1) hour.

PART 3.0 STANDARDS

3.1 General Requirements:

Any person shall take all reasonable precautions to prevent dust emissions. Reasonable precautions may include, but are not limited to, cessation of operations, cleanup, sweeping, sprinkling, compacting, enclosure, chemical or asphalt sealing, and use of wind screens or snow fences.

A. No person may disturb the topsoil or remove ground cover on any real property and thereafter allow the property to remain unoccupied, unused, vacant or undeveloped unless reasonable precautions are taken to prevent generation of dust. A dust control plan must be submitted to and approved by the Air Pollution Control Officer before topsoil is disturbed on any project where more than one (1) acre of natural surface area is to be altered or where the natural ground cover is removed. In the dust control plan, the Air Pollution Control Officer may require use of palliatives, reseeding, or other means to minimize windblown dust.

B. For any proposed development, division of land, special use permit application of zone change, the Air Pollution Control Officer may require the applicant to submit soils data and any other pertinent data for the area in which the development is proposed.

C. If a determination is made that the disturbance (per 3.1.A.) or development (per 3.1.B.) of the site may cause the generation of dust, the Air Pollution Control Officer may require:

1. Phased clearing of the land
2. The use of palliatives
3. The use of water
4. The use of snow fencing
5. The use of wind screen
6. Reseeding
7. Controls of single lot development approved as a part of a land subdivision subject to these regulations.
8.

After commencement of development, if the approved elements of the dust control plan prove ineffective, the Air Pollution Control Officer may require additional control measures to be instituted. Phasing will not be required as a control strategy after a project is under construction. In the case of subdivisions, condominiums and planned unit developments, a dust control plan must be submitted as part of the final map approval process.

If a development requires a special use permit, the Air Pollution Control
Officer may require the dust control plan to be submitted and become a
condition of the special use permit process.

D. No person shall cause or allow the handling or storage of

any materials on a manner which results, or may result in the generation of dust.

E. Any vehicle operating on a paved roadway with a load of any bulk material susceptible to being dropped, spilled, leaked, or other wise escaping therefrom and being entrained in the air, must take one of the following control measures:

1. Six (6) inches of freeboard is maintained within the bed of the vehicle. For the purposes of this regulation, "freeboard" means the vertical distance from the highest portion of the edge of the load to the lowest part of the rim of the truck bed.

2. Materials contain enough moisture to control dust emissions from the point of origin to their final destination. Whenever possible, the use of dust suppressants must be applied in conjunction with the water.

3. In the event that measures 1 or 2 are ineffective in preventing materials from escaping, tarps or other cargo covers shall be employed. This section does not prohibit a public maintenance vehicle from depositing sand on a paved roadway to enhance traction, or sprinkling water or other substances to clean or maintain a highway.

F. Paved entry aprons or other effective cleaning techniques (e.g., wheel washers), may be required by the Air Pollution Control Officer to prevent tracking onto paved roadways. Paved entry aprons may include road section or coarse aggregate or steel grate to "knock off" dirt which accumulates on the vehicle and/or vehicle wheels. Any material which is tracked onto a paved roadway must be removed (swept or washed) as quickly and as safely as possible. Exceptions to this provision may be made by the Air Pollution Control Officer for the construction, maintenance, and/or repair of paved roadways and for the application of de-icing and traction materials for wintertime driving safety.

PART 4.0 ADMINISTRATIVE REQUIREMENTS

4.1 Correction of Condition:

If the Air Pollution Control Officer documents that a person is in noncompliance with any of the provisions contained in Subsection 3.1, he will notify the person of that fact and specify a period of time in which the person must achieve compliance. Failure to comply within 24 hours or as the time determined by the Air Pollution Control Officer constitutes grounds for a Notice of Violation (NOV) citation per the District Enforcement Policy.

4.2 Remedial Action:
The Air Pollution Control Officer, after proper notice, may enter upon any real property where dust is being generated and take such remedial and corrective action as he deems necessary.

4.3 Costs:

Any costs incurred in connection with any remedial or corrective action taken by the Air Pollution Control Officer, pursuant to this section, shall be assessed against the owner of the property involved. Failure to pay the full amount of such incurred costs shall result in a lien against the property. The lien shall remain in effect until all costs have been fully paid, which may include, but are not limited to, cost of collection and reasonable attorney fees.

Adopted 5/11/94

SECTION 01600
PRODUCTS, MATERIALS, EQUIPMENT, AND SUBSTITUTIONS

PART 1 – GENERAL

1.1 DEFINITIONS

A. The word "Products," as used herein, is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for the Project or taken from CONTRACTOR's stock of previously purchased Products.

B. The word "Materials," is defined as Products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of Work.

C. The word "Equipment" is defined as Products with operational parts, regardless of whether motorized or manually operated, and particularly including Products with service connections (wiring, piping, and other like items).

D. Definitions given in this section are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.

E. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying and erection of the WORK.

1.2 QUALITY ASSURANCE

A. **Source Limitations:** To the greatest extent possible for each unit of Work, the CONTRACTOR shall provide Products, Materials, and Equipment of a singular generic kind from a single source.

B. **Compatibility of Options:** Where more than one choice is available as options for CONTRACTOR's selection of a Product, Material, or Equipment, select an option which is compatible with other Products, Materials, or Equipment. Compatibility is a basic general requirement of Product, Material and Equipment selections.

1.3 PRODUCT DELIVERY AND STORAGE

A. The CONTRACTOR shall deliver and store the WORK in accordance with manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of Products at Site and overcrowding of construction spaces. In particular, ensure coordination to ensure minimum holding or storage times for flammable, hazardous, easily damaged, or sensitive Materials to deterioration, theft, and other sources of loss.

1.4 TRANSPORTATION AND HANDLING

A. Products shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging.

B. The CONTRACTOR shall furnish Equipment and personnel to handle Products, Materials, and Equipment, including those provided by DISTRICT, by methods to prevent soiling and damage.

C. The CONTRACTOR shall provide any additional protection necessary during handling to prevent marring and otherwise damaging Products, packaging, and surrounding surfaces.

1.5 STORAGE AND PROTECTION

A. Products shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive Products shall be stored in weather-tight climate controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.

B. For exterior storage of fabricated Products, Products shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.

C. Loose granular materials shall be stored on solid flat surfaces in a well-drained area and shall be prevented from mixing with foreign matter.

D. Storage shall be arranged to provide access for inspection. Periodically inspect to assure Products are undamaged and are maintained under required conditions.

E. Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

1.6 MAINTENANCE OF STORAGE

A. Stored Products shall be periodically inspected on a scheduled basis. Maintain a log of inspections and make the log available on request.

B. The CONTRACTOR shall comply with manufacturer's Product storage requirements and recommendations.

C. The CONTRACTOR shall maintain manufacturer-required environmental conditions continually.

D. The CONTRACTOR shall ensure that surfaces of Products exposed to the elements are not adversely affected and that weathering of finishes does not occur.

E. For mechanical and electrical Equipment, the CONTRACTOR shall provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.

1.7 PROPOSED SUBSTITUTIONS OR "OR-EQUAL" ITEM

A. Whenever materials or equipment are indicated in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required. If the name is followed by the words "or equal" indicating that a substitution is permitted, materials or equipment of other suppliers may be accepted if sufficient information is submitted to allow the DISTRICT to determine that the material or equipment proposed is equivalent or equal to that named, subject to the following requirements:

1. The burden of proof as to the type, function, and quality of any such substitution product, material or equipment shall be upon the CONTRACTOR.

2. The DISTRICT will be the sole judge as to the type, function, and quality of any such substitution and the DISTRICT's decision shall be final.

3. The DISTRICT may require the CONTRACTOR to furnish additional data about the proposed substitution.

4. The DISTRICT may require the CONTRACTOR to furnish a special performance warranty or other surety with respect to any substitution.

5. Acceptance by the DISTRICT of a substitution item shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitution.

6. The CONTRACTOR shall be responsible for resultant changes including design and construction changes resulting from the changes which the accepted substitution requires in the CONTRACTOR's WORK, the WORK of its Subcontractors and of other contractors.

B. If the name of a proprietary item or the name of a particular Supplier is not followed by the words “or equal”, substitutions are not allowed and the specified product shall be furnished by the CONTRACTOR with the following exceptions:

1. In the event that a named Supplier is no longer doing business under the name indicated, the specified product from the legal successors to the named Supplier shall be furnished.

2. In the event that a named product is no longer available from the named Supplier due to acquisition or sale of the given product line, but the product is available from another Supplier, the CONTRACTOR shall provide the named product. In such cases, the CONTRACTOR shall submit a Substitution Request Form and shall include certification from the Supplier that product being supplied is materially and functionally identical to the product named in the Contract Documents.

3. In the event that a named product is no longer available from the named Supplier or any other Supplier, the CONTRACTOR shall notify the DISTRICT in writing and the DISTRICT shall identify suitable substitute products. The CONTRACTOR shall provide one of the suitable substitute products.

C. The procedure for review of proposed substitutions by the DISTRICT will include the following:

1. If the CONTRACTOR wishes to provide a substitution item, make written application to the DISTRICT on the "Substitution Request Form."

2. Unless otherwise provided by law or authorized in writing by the DISTRICT the "Substitution Request Form(s)" shall be submitted within the 35-day period after Notice to Proceed.

3. Wherever a proposed substitution item has not been submitted within said 35-day period, or wherever the submission of a proposed substitution material or equipment has been judged to be unacceptable by the DISTRICT, the CONTRACTOR shall provide the material or equipment indicated in the Contract Documents.

4. The CONTRACTOR shall certify that the proposed substitution will perform adequately the functions and achieve the results called for by the general design, and be similar and of equal substance to that indicated, and be suited to the same use as that indicated.

5. The DISTRICT will evaluate each proposed substitution within a reasonable period of time.

6. As applicable, no shop drawing submittals shall be made for a substitution item nor shall any substitution item be ordered, installed, or utilized without the DISTRICT'S prior written acceptance of the CONTRACTOR's "Substitution Request Form."

7. The DISTRICT will record the time required by the DISTRICT in evaluating substitutions and in making changes by the CONTRACTOR in the Contract Documents occasioned thereby.

D. The CONTRACTOR's application using the "Substitution Request Forms" shall contain the following statements and information which will be considered by the DISTRICT in evaluating the proposed substitution:

1. The evaluation and acceptance of the proposed substitution shall not prejudice the CONTRACTOR's achievement of substantial completion on time.

2. Whether or not acceptance of the substitution for use in the WORK will require a change in any of the Contract Documents to adapt the design to the proposed substitution.

3. Whether or not incorporation or use of the substitution in connection with the WORK is subject to payment of any license fee or royalty.

4. Information in the substitution request shall be organized in the format required for submittals as described in Section 01300-Contractor Submittals. Non-compliant substitution requests will not be reviewed.

5. All variations of the proposed substitution from the items originally indicated shall be identified.

6. Available maintenance, repair, and replacement service shall be indicated. The manufacturer shall have a local service agency (within 120 miles of the Site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.

7. Itemized estimate of all costs that will result directly or indirectly from acceptance of such substitution, including cost of redesign and claims of other contractors affected by the resulting change.

E. Without any increase in cost to the DISTRICT, the CONTRACTOR shall be responsible for and pay all costs in connection with proposed substitutions and of inspections and testing of equipment or materials submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK, whether or not the DISTRICT accepts the proposed substitution or proposed equipment or material. The CONTRACTOR shall reimburse the DISTRICT for the charges of the DISTRICT, and other authorized representatives for evaluating each proposed substitution and costs for any additional inspection caused by the substitution.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

SECTION 01610
INSTALLATION OF DISTRICT FURNISHED ITEMS

PART 1 – GENERAL

1.1 GENERAL

A. This section covers the Work necessary for installation of DISTRICT-furnished equipment, materials and products.

1.2 INSURANCE

A. The CONTRACTOR shall include in his insurance coverage for the Work under this Contract, sufficient coverage to protect the DISTRICT-furnished equipment and materials against all losses during unloading, storage, installation and until final acceptance of the Work by the DISTRICT. The DISTRICT shall be named as co-insured for this equipment and materials.

1.3 PAYMENT

A. Payment to the CONTRACTOR for the installation of DISTRICT-furnished items shall be as listed on the Bid Schedule.

PART 2 – PRODUCTS

2.1 ITEMS TO BE FURNISHED BY THE DISTRICT

A. The table at the end of this section gives a listing of items to be furnished by the DISTRICT.

B. All equipment, materials and products furnished to the CONTRACTOR and not used in construction of the project shall remain the property of the DISTRICT.

2.2 CONTRACTOR-SUPPLIED EQUIPMENT, MATERIALS & PRODUCTS

A. Except for equipment, materials and products specifically specified as "DISTRICT-furnished", all other items required to complete the Work under this Contract shall be provided by the CONTRACTOR.

PART 3 – EXECUTION

3.1 GENERAL

A. All Work shall be in conformance with the manufacturer's recommended procedures, instructions, and shop drawings, as approved by the DISTRICT. The CONTRACTOR shall receive, transport to its place of installation, unload, inspect, and maintain an inventory on all DISTRICT-furnished equipment and materials.

3.2 STORAGE AND PROTECTION

A. Following delivery of DISTRICT-furnished equipment, and until final acceptance of the completed Work, the CONTRACTOR shall protect and maintain the equipment in a condition that will prevent damage in accordance with the DISTRICT-approved manufacturer's instructions. Equipment subject to damage by the elements shall be protected in a manner acceptable to the DISTRICT. The CONTRACTOR shall replace equipment items that become corroded, damaged, or deteriorated prior to final acceptance of the Work at no additional cost to the DISTRICT.

3.3 INSTALLATION AND ASSEMBLY

A. The CONTRACTOR shall provide all supervision, labor, tools, construction equipment, incidental materials, and the necessary services required to complete the installation of the DISTRICT-furnished equipment. All assembly of equipment shall be in accordance with the manufacturer's written instructions, or under the direction of the manufacturer's field representative.

3.4 DELIVERY AND UNLOADING

A. The CONTRACTOR shall be responsible for transportation to the project site, and unloading of the materials. These materials will be located at the DISTRICT'S warehouse at 11570 Donner Pass Road. The DISTRICT will assist with loading of the materials at the warehouse. The CONTRACTOR shall request availability of the materials for pick up a minimum of 24 hours in advance.

PART 4 – LISTING OF EQUIPMENT AND MATERIALS TO BE FURNISHED BY THE DISTRICT

DESCRIPTION	QUANTITY
Control Panel Including PLC and Programming	1

* * END OF SECTION * *

SECTION 01700
PROJECT CLOSEOUT

PART 1 – GENERAL

1.1 FINAL CLEANUP

A. The CONTRACTOR shall promptly remove from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final Acceptance of the Work by the DISTRICT will be withheld until the CONTRACTOR has satisfactorily complied with the requirements for final cleanup of the project site and the requirements below.

1.2 COMPLETION PROCEDURES

A. When the CONTRACTOR believes Substantial Completion has been achieved, request in writing to the DISTRICT that Substantial Completion be recognized as having been achieved and request that the DISTRICT issue a Certificate of Substantial Completion. Prior to making such a request, the CONTRACTOR must have:

1. Completed all WORK necessary for the safe, proper, and complete use or operation of the Project.

2. Prepared a CONTRACTOR-generated punch list for submission with the request for issuance of a Certificate of Substantial Completion.

3. Submitted and received acceptance of accurate record drawings for all WORK completed to date.

4. Submitted and received acceptance of all specified warranties, bonds and guarantees.

B. Upon receipt of the request from the CONTRACTOR, the DISTRICT will review the request, the WORK and the above requirements to determine whether the CONTRACTOR has achieved Substantial Completion. If this review fails to support Substantial Completion, the DISTRICT will notify the CONTRACTOR in writing, citing the reasons for rejection. If the DISTRICT determines the CONTRACTOR has reached Substantial Completion, the following procedures will be followed:

1. The DISTRICT will review the WORK and the CONTRACTOR'S punch list to ensure that all deficiencies are noted on a final punch list.

2. The DISTRICT will schedule and conduct a walk-through of the Project with the CONTRACTOR for the purpose of formally reviewing the WORK, the final punch list, and the readiness of the WORK for use. Any additional items noted during the walk-through will be added to the punch-list.

3. Upon completion of the walk-through, provided that the walk-through has verified that the WORK is in fact ready for use for its intended purpose, the Project will be considered Substantially Complete. The DISTRICT will issue a letter certifying the date of Substantial Completion to the CONTRACTOR.

C. Final Completion will be deemed to have occurred when all WORK is completed including the following:

1. All final punch list items have been corrected, signed off by the CONTRACTOR and the DISTRICT during a final walk-through.

2. All updates to the record drawings have been made.

3. Demobilization and site clean-up are complete.

4. All facilities and/or equipment have been properly demonstrated to be functioning as required.

5. The CONTRACTOR has furnished to the DISTRICT, releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

6. All Final Submittals shall be made as noted herein.

1.3 CLOSEOUT PROCEDURE

A. The DISTRICT and the CONTRACTOR shall meet and resolve all outstanding issues including:

1. Claims and adjustments for time or costs.

2. Procedures for handling warranty issues.

B. A Final Change Order shall be processed, if required. Final payment and close out procedures shall comply with all requirements of the Contract Documents.

1.4 FINAL SUBMITTALS

A. Prior to requesting final payment, the CONTRACTOR shall obtain and submit the following items to the DISTRICT:

1. Written warranties and guarantees, where required.

2. Completed record drawings.

3. Certificates of inspection and acceptance by local governing agencies having jurisdiction.

4. Release of liens or release of claims forms submitted by all Subcontractors and Suppliers.

1.5 MAINTENANCE AND WARRANTY

A. Comply with the maintenance and warranty requirements contained in the Contract Documents.

B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or

resurfacing which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the CONTRACTOR shall have obtained a statement in writing from the affected private authority or public agency releasing the DISTRICT from further responsibility in connection with such repair or resurfacing.

C. Make all warranty repairs and replacements promptly upon receipt of written order from the DISTRICT. If the CONTRACTOR fails to make such repairs or replacements promptly, the DISTRICT reserves the right to do the WORK and the CONTRACTOR and his surety shall be liable to the DISTRICT for the cost thereof.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

* * END OF SECTION * *

Division 2 – Earthwork

SECTION 02100
SITE PREPARATION

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The WORK of this Section includes measures required during the CONTRACTOR's initial move onto the Site to protect existing fences, houses and associated improvements, streets, and utilities downslope of construction areas from damage due to boulders, trees or other objects dislodged during the construction process.

1.2 SITE INSPECTION

A. Prior to moving onto the Site, the CONTRACTOR shall inspect the Site conditions and review maps of the pump station site, pipeline routes, and documents delineating the DISTRICT's property and right-of-way lines.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 SITE ACCESS

A. The CONTRACTOR shall develop any necessary access to the Site, including access barriers to prohibit entry of unauthorized persons.

B. **Utility Interference:** Where existing utilities interfere with the WORK, the CONTRACTOR shall notify the utility owner and the DISTRICT before proceeding.

3.2 SITE CONDITIONS

A. The CONTRACTOR shall promptly notify the DISTRICT if any of the following conditions are encountered:

1. Material that the CONTRACTOR believes may be hazardous waste as defined in Section 25117 of the California Health and Safety Code or that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.

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

3. Unknown physical conditions at the site of any unusual nature, materially different from those normally encountered and generally recognized as inherent in the work of the character provided for in the Contract Documents.

B. The DISTRICT shall promptly investigate, and determine whether the conditions do materially differ, do involve hazardous waste and impact the CONTRACTOR’s cost and time required to complete the WORK required by the Contract Documents. If it is determined that an increase or decrease in the CONTRACTOR’s cost or time required is

justified, the DISTRICT will issue a change order in accordance with the procedures described in the Contract Documents.

C. In the event that a dispute arises between the DISTRICT and the CONTRACTOR, as to whether the conditions do materially differ, do involve hazardous waste, or do impact CONTRACTOR's cost and time required to complete the WORK, the CONTRACTOR shall not be excused from any scheduled milestone or completion date provided by the Contract Documents, but shall proceed with all WORK required by the Contract Documents. The CONTRACTOR shall retain any and all rights provided either by contract or by law that pertain to the resolution of disputes and protests between contracting parties.

3.3 EROSION CONTROL

A. Prior to commencing any excavation activities, the CONTRACTOR shall implement erosion control measures to prevent the erosion and transport of sediment from the Project site. The CONTRACTOR is referred to Section 01560 – Temporary Environmental Controls for more information regarding erosion control.

3.4 CLEARING, GRUBBING, AND STRIPPING

A. Construction areas shall be cleared of grass and weeds to at least a depth of six inches and cleared of structures, pavement, sidewalks, concrete or masonry debris, trees, logs, upturned stumps, loose boulders, and any other objectionable material of any kind which would interfere with the performance or completion of the WORK, create a hazard to safety, or impair the subsequent usefulness of the WORK, or obstruct its operation. Loose boulders within 10 feet of the top of cut lines shall be relocated and incorporated in landscaping or removed from the Site.

B. Topsoil shall be stripped to a depth of 8 inches and stockpiled in a manner that will not interfere with construction. Stockpiled topsoil shall be used as final backfill in areas not to be paved. Shrubs, bushes and minor vegetation shall be ground or chipped to a mulching consistency and mixed with the stripped soils. Trees and stumps shall be removed from the site and disposed of in an appropriate manner. Stockpiled topsoil shall be stabilized by tackifiers or protected with tarpaulins to prevent stockpiles from creating a dust hazard or eroding during rain events.

C. Within the limits of clearing, the areas below the natural ground surface shall be grubbed to a depth necessary to remove all stumps, roots, buried logs, and all other objectionable material. All objectionable material from the clearing and grubbing process shall be removed from the Site and wasted in approved safe locations.

D. Only trees, plants and shrubs that are designated for removal shall be removed. The removal of any other trees, shrubs, fences, or other improvements, either inside or outside of rights-of-way, if necessary for the CONTRACTOR's choice of means and methods, shall be arranged with the owner of the property, and shall be removed and replaced, at no additional cost to the DISTRICT.

E. Trees, plants, are shrubs that are not to be removed shall be protected from injury and damage. Any such trees, plants or shrubs that are removed or damaged due to the negligence of the CONTRACTOR, shall be replaced by the CONTRACTOR at no additional cost to the DISTRICT. Such replacement shall be to the satisfaction of the DISTRICT and the owner of said trees, plants or shrubs.

F. Burning of waste debris shall conform to all applicable local regulations. Prior to any intended burning, the CONTRACTOR shall furnish to the DISTRICT, a copy of the CONTRACTOR's burning permit as issued by the local agency having jurisdiction.

G. Any materials wrongfully removed from the Site shall be paid for by the CONTRACTOR. The cost of any such items removed shall be agreed upon by the owner and the CONTRACTOR. However, if such an agreement is not reached, the DISTRICT shall determine the value of the items and that amount shall be withheld from the next progress payment due.

* * END OF SECTION * *

SECTION 02200
EARTHWORK

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall perform all earthwork indicated and required for construction of the WORK, complete and in place, in accordance with the Contract Documents.

B. This Section covers work not covered in Section 02315 Structure Excavation and Fill.

C. The CONTRACTOR's attention is directed to the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The CONTRACTOR, prior to beginning any trench or structure excavation requiring shoring, shall develop a detailed plan showing design of all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation of such trenches or structure excavation. If such plan varies from the shoring system standards established in the Construction Safety Orders of the State of California, such alternative systems plans shall be prepared by a civil or structural engineer licensed in the State of California.

1.2 NOTIFICATIONS TO THE CONTRACTOR

A. The CONTRACTOR is hereby notified that investigations of subsurface soil conditions have not been conducted in conjunction with the preparation of these Contract Documents. The CONTRACTOR is further advised that subsurface conditions may vary throughout the project site. The DISTRICT makes no guaranty, either written or implied, that materials obtained on site are suitable for use in the WORK. The CONTRACTOR shall not be entitled to any additional compensation in the event that materials obtained on site are not suitable for use in the WORK.

B. The CONTRACTOR is hereby notified that investigations of subsurface groundwater conditions have not been conducted in conjunction with the preparation of these Contract Documents. The CONTRACTOR is further advised that subsurface groundwater conditions may vary throughout the project site. Groundwater may be naturally occurring or may be leakage from existing water system facilities. The CONTRACTOR shall be responsible for removal and exclusion of groundwater as necessary to construct the Work in accordance with the Contract Documents. The CONTRACTOR shall not be entitled to any additional compensation in the event that groundwater is encountered.

ASTM C150	Portland Cement
ASTM C618	Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Test Method for Laboratory Compaction Characteristics of Soils Using Modified Effort (56,000 ft - lbf/ft$_3$) (2,700 kN-m/m$_3$)

ASTM D1633	Standard Test Method for Compressive Strength of Molded Soil-Cement Cylinders
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2487	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2901	Standard Test Method for Cement Content of Freshly Mixed Soil Cement
ASTM D2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D4253	Standard Test Method for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D4254	Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
California Test 643	Method for Estimating the Service Life of Steel Culverts

PART 2 – PRODUCTS

2.1 SUITABLE FILL AND BACKFILL MATERIAL REQUIREMENTS

A. **General:** Fill, backfill, and embankment materials shall be suitable selected or processed clean, fine earth, rock, or sand, free from grass, roots, brush, or other vegetation.

B. **Suitable Materials:** Materials defined below are suitable materials and may be used in fills, backfilling, and embankment construction subject to the indicated limitations.

C. Suitable materials may be obtained from on-site excavations, may be processed on-site materials, or may be imported. If imported materials are required by this Section or to meet the quantity requirements of the WORK, the CONTRACTOR shall provide the imported materials at no additional expense to the DISTRICT. The DISTRICT makes no guaranty, either written or implied, that materials obtained on site are suitable for use in the WORK.

D. The following types of suitable materials are defined:

1. Type A (three-inch minus granular backfill): Crushed rock or gravel, and sand with the gradation requirements below. Volcanic cinders meeting these requirements may be used. Processed native material may be used, provided that it meets all other requirements of this Section.

Sieve Size	Percentage Passing
3-inch	100
No. 4	35 - 100
No. 40	20 - 100
No. 200	0 - 25

2. Type B (three-quarter inch minus granular backfill): Crushed rock or gravel, and sand with the gradation requirements below. The material shall have a minimum sand equivalent value of 20. Volcanic cinders meeting these requirements may be used.

Sieve Size	Percentage Passing
3/4-inch	100
No. 4	35 -100
No. 200	0 – 15

3. Type C (sand backfill): Clean well graded sand meeting the gradation requirements below. Material shall have a sand equivalent value not less than 30.

Sieve Size	Percentage Passing
3/8-inch	100
No. 4	50 -90
No. 200	0 – 20

4. Type D (six-inch minus granular backfill): Clean well graded stone, gravel and sand meeting the gradation requirements below. Processed native material may be used, provided that it meets all other requirements of this Section.

Sieve Size	Percentage Passing
6-inch	100
3-inch	80 - 100
No. 4	35 – 100

5. Type E (pea gravel backfill): Crushed rock or gravel with 100 percent passing a 1/2-inch sieve and not more than 10 percent passing a Number 4 sieve.

6. Type F (coarse drain rock): Crushed rock or gravel meeting the following gradation requirements:

Sieve Size	Percentage Passing
2-inch	100
1-1/2-inch	90 - 100
1-inch	20 - 55
3/4-inch	0 – 15

7. Type G (aggregate base): Aggregate base shall conform to the requirements given in Section 02460 – A.C. Pavement & Base.

8. Type H (graded drain rock): Drain rock shall be crushed rock, gravel or sand, durable and free from slaking or decomposition under the action of alternate wetting or drying. The drain rock shall have a sand equivalent value not less than 75. The material shall be uniformly graded and shall meet the following gradation requirements:

Sieve Size	Percentage Passing
3/4-inch	100
1/2-inch	95 – 100
3/8-inch	70 – 100
No. 4	0 - 55
No. 8	0 - 10

No. 200 0 - 3

9. Type I: Not Used

10. Type J (Soil Cement): Material which consists of any mixture of Types B, C, G, and H materials which has been cement-treated so that the cement content of the material is not less than 5 percent by weight when tested in accordance with ASTM D2901. The ultimate compressive strength at 28 days shall be not less than 400 psi when tested in accordance with ASTM D 1633.

11. Type K (topsoil): Stockpiled topsoil material which has been obtained at the site by removing soil to a depth not exceeding 2 feet. Removal of the topsoil shall be done after the area has been stripped of vegetation and debris.

12. Type L (slurry cement backfill): Slurry cement backfill shall conform to the requirements of Section 19-3.062 of the Standard Specifications.

13. Type M (aggregate subbase): Not Used

14. Type N Material (Modified 6-inch minus backfill): Type N Material shall meet the general gradation requirements for Type D Material. However, intermittent rocks and boulders up to 12-inches (largest dimension) may be included.

2.2 UNSUITABLE MATERIAL

A. A. Unsuitable materials include the materials listed below.

1. Soils which, when classified under ASTM D 2487, fall in the classifications of PT, OH, CH, MH, or OL.

2. Soils which cannot be compacted sufficiently to achieve the density specified for the intended use.

3. Materials that contain hazardous or designated waste materials including petroleum hydrocarbons, pesticides, heavy metals, and any material which may be classified as hazardous or toxic according to applicable regulations.

4. Soils that contain greater concentrations of chloride or sulfate ions, or have a soil resistivity or pH less than the existing on-site soils.

5. Topsoil, except as allowed below.

2.3 USE OF FILL, BACKFILL, AND EMBANKMENT MATERIAL TYPES

A. The CONTRACTOR shall use the types of materials as designated herein for all required fill, backfill, and embankment construction hereunder.

B. Where these Specifications conflict with the requirements of any local agency having jurisdiction or with the requirements of a pipe material manufacturer, the DISTRICT shall be immediately notified. In case of conflict between types of pipe embedment backfills, the CONTRACTOR shall use the backfill material that provides a

greater degree of structural support to the pipe, as determined by the DISTRICT. In case of conflict between types of trench or final backfill types, the CONTRACTOR shall use the backfill material that provides the greater in-place density after compaction.

C. Fill and backfill types shall be used in accordance with the following provisions:

1. Embankment fills shall be constructed of Type A, D or G material as defined herein.

2. Pipe zone backfill, as defined in Article 3.12 of this Section, shall be Type B or Type C material.

3. Trench zone backfill, as defined in Article 3.12 of this Section, shall be as follows:

a. Trench zone backfill in areas to be paved shall be Type A or Type L material.

b. Trench zone backfill in areas not to be paved shall be Type D or Type L material.

4. Final backfill material for pipelines under paved areas, as defined in Article 3.12 of this Section, shall be Type G backfill material.

5. Final Backfill Under Areas Not to be Paved:

a. Final backfill under areas not to be paved shall be the same material as that used for trench zone backfill. The top six inches of final backfill shall consist of topsoil that was stripped and stockpiled as indicated in Section 02100 – Site Preparation. Topsoil shall be compacted to a density of 85 percent. Topsoil shall not be placed until all other construction activities are completed. The movement of vehicles across an area will not be permitted after topsoil has been placed.

b. After placement of topsoil, a seed/fertilizer mixture shall be placed in accordance with Section 02900 – Site Revegetation.

c. After placement of the seed/fertilizer mixture, a layer of pine needles shall be placed uniformly over the topsoil at a rate of 0.1 pounds per square foot. Pine needles shall be imported to the project site and shall not be gathered from the immediate surrounding area. The CONTRACTOR may gather pine needles on the project site directly along pipeline route and store them for later use. All such gathering shall take place prior to stripping of the topsoil.

6. Trench zone backfill and final backfill for pipelines under structures shall be the same material as used in the pipe zone, except where concrete encasement is required by the Contract Documents.

7. Aggregate base materials under pavements shall be Type G material constructed to the thicknesses indicated.

8. Backfill around structures shall be Types A through Type H materials, or any mixture thereof.

9. Backfill used to replace pipeline trench over-excavation shall be the same material as used for the pipe zone backfill if the trench conditions are not wet. If trench conditions are wet, a layer of Type F material with a layer of filter fabric to prevent migration of fines shall be used. Filter fabric shall comply with the requirements given for Underdrains in Section 88-1.03 of the Standard Specifications.

2.4 MATERIALS TESTING

A. All soils testing of samples submitted by the CONTRACTOR shall be done by a testing laboratory of the DISTRICT'S choice and at the DISTRICT'S expense. At its discretion, the DISTRICT may request that the CONTRACTOR supply samples for testing of any material used in the work.

B. Particle size analysis of soils and aggregates shall be performed using ASTM D422.

C. Determination of sand equivalent value shall be performed using ASTM D2419.

D. **Unified Soil Classification System:** References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D2487. The CONTRACTOR shall be bound by all applicable provisions of said ASTM D2487 in the interpretation of soil classifications.

E. The testing for chloride, sulfate, resistivity, and pH shall be done in accordance with California Test Method 643 of the California Department of Transportation.

PART 3 – EXECUTION

3.1 EXCAVATION – GENERAL

A. **General:** Except when specifically provided to the contrary, excavation shall include the removal of all materials (including rock) of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the WORK. The removal of said materials shall conform to the lines and grades indicated or ordered. Unless otherwise indicated, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The CONTRACTOR shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

B. **Removal and Exclusion of Water:** The CONTRACTOR shall remove and exclude water, including stormwater, groundwater, irrigation water, water from leaking pipes, and wastewater, from all excavations. Dewatering wells, well points, sump pumps, or other means shall be used to remove water and continuously maintain groundwater at a level at least two feet below the bottom of excavations. Water shall be removed and excluded until backfilling is complete and all field soils testing has been completed.

C. If a moveable trench shield is used during excavation, pipe installation, and backfill operations, the shield shall be moved by lifting the shield free of the trench bottom or backfill and then moving the shield horizontally without binding against the trench sidewalls. The CONTRACTOR shall not drag trench shields along the trench causing damage or displacement to the trench sidewalls, the pipe, or the bedding and backfill. If the trench walls cave in or slough, the trench shall be excavated as an open excavation with sloped sidewalls, or trench shoring shall be used.

3.2 STRUCTURE, ROADWAY, AND EMBANKMENT EXCAVATION

A. **Excavation of Currently Unpaved Areas to be Paved:** Excavation under currently unpaved areas to be paved shall extend to the bottom of the aggregate base or subbase, if such base is called for; otherwise it shall extend to the paving thickness. After the required excavation has been completed, the top 12 inches of exposed surface shall be scarified, brought to optimum moisture content, and rolled with heavy compaction equipment to obtain 95 percent of maximum density. The finished subgrade shall be even, self-draining, and in conformance with the slope of the finished pavement. Areas that could accumulate standing water shall be regraded to provide a self-draining subgrade.

B. **Notification of DISTRICT:** The CONTRACTOR shall notify the DISTRICT at least 3 days in advance of completion of any structure excavation and shall allow the DISTRICT a review period of at least one day before the exposed foundation is scarified and compacted or is covered with backfill or with any construction materials.

3.3 PIPELINE AND UTILITY TRENCH EXCAVATION

A. A. Exploratory Excavation:

1. The CONTRACTOR shall excavate and expose buried points of connection to existing utilities where indicated on the Drawings. Excavation shall be performed prior to preparation of Shop Drawings for connections and before fabrication of pipe, and the data obtained shall be used in preparing Shop Drawings.

2. Data, including dates, locations excavated, and sketches, shall be submitted to the DISTRICT within one week of excavation.

3. Damage to utilities from excavation activities shall be repaired by the CONTRACTOR at no additional cost to the DISTRICT.

B. **General:**

1 Unless otherwise indicated or ordered, excavation for pipelines and utilities shall be open-cut trenches with widths as indicated. Trench width shall be adequate to allow the pipe to be aligned in the center of trench, including pipes installed on curves. In no case shall the distance from the edge of the trench to the edge of the pipe be less than 12-inches.

2. Damage to utilities from excavation activities shall be repaired by the CONTRACTOR at no additional cost to the DISTRICT.

C. **Trench Bottom:** The bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe bedding. Excavations for pipe bells, couplings and welding shall be made as required. The use of mounds of material to support the pipe shall not be permitted.

D. **Open Trench:** The maximum amount of open trench permitted in any one location shall be 500 feet, or the length necessary to accommodate the amount of pipe installed in a single day, whichever is greater. All trenches shall be fully backfilled at the end of each day or, in lieu thereof, shall be covered by heavy steel plates adequately braced and capable of supporting vehicular traffic in those locations where it is impractical to backfill at the end of each day. The above requirements for backfilling or use of steel plate will be waived in cases where the trench is located further than 100 feet from any traveled roadway or occupied structure. In such cases, however, barricades and warning lights meeting safety requirements shall be provided and maintained. Additional requirements regarding the protection of open excavations described in Section 01530 – Protection of Existing Facilities.

E. **Trench Over-Excavation:** Where trenches are indicated to be over-excavated, excavation shall be to the depth indicated, and backfill shall be installed to the grade of the bottom of the pipe bedding.

F. **Over-Excavation:** When ordered by the DISTRICT, whether indicated on the Drawings or not, trenches shall be over-excavated beyond the depth and/or width shown. Such over-excavation shall be to the dimensions ordered. The trench shall then be backfilled to the grade of the bottom of the pipe bedding. Over-excavation less than 6 inches below the limits on the Drawings shall be done at no increase in cost to the DISTRICT. When the over-excavation ordered by the DISTRICT is 6 inches or greater below the limits shown, or wider, additional payment will be made to the CONTRACTOR. Said additional payment will be made under separate unit price bid items for over-excavation if such bid items have been established; otherwise payment will be made in accordance with a negotiated price.

G. Where pipelines are to be installed in embankments, fills, or structure backfills, the fill shall be constructed to a level at least one foot above the top of the pipe before the trench is excavated.

3.4 OVER-EXCAVATION NOT ORDERED OR INDICATED

A. Any over-excavation carried below the grade ordered or indicated, shall be backfilled to the required grade with the indicated material and compaction. Such work shall be performed by the CONTRACTOR at no additional cost to the DISTRICT.

3.5 EXCAVATION IN LAWN AREAS

A. Where excavation occurs in lawn areas, the sod shall be carefully removed, dampened, and stockpiled to preserve it for replacement. Excavated material may be placed on the lawn; provided, that a drop cloth or other suitable method is employed to protect the lawn from damage. The lawn shall not remain covered for more than 72 hours. Immediately after completion of backfilling and testing of the pipeline, the sod shall be replaced and lightly rolled in a manner so as to restore the lawn as near as possible to its original condition. CONTRACTOR shall provide new sod if stockpiled sod has not been replaced within 72 hours.

3.6 EXCAVATION IN VICINITY OF TREES

A. Except where trees are indicated to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without express permission of the DISTRICT. Trees shall be supported during excavation by any means previously reviewed by the DISTRICT.

3.7 ROCK EXCAVATION

A. The CONTRACTOR is hereby notified that bedrock and boulders in excess of three feet (maximum dimension) may be encountered.

B. **Explosives and Blasting**: Blasting will be permitted only upon written authorization from the DISTRICT.

C. Rock Excavation:

1. For all Work requiring trenches 3 feet in width or less, rock excavation shall be defined as removal of solid material which by actual demonstration cannot, in the DISTRICT'S opinion, be reasonably loosened or ripped by a hydraulic excavator or backhoe loader with a minimum 150 flywheel horsepower and that must be systematically drilled and blasted or broken with power-operated hammers or other such equipment.

2. For all Work requiring trenches greater than 3 feet in width, rock excavation shall be defined as removal of solid material which by actual demonstration cannot, in the DISTRICT's opinion, be reasonably loosened or ripped by a hydraulic excavator or backhoe loader with a minimum 150 flywheel horsepower and that must be systematically drilled and blasted or broken with power-operated hammers or other such equipment.

3. When performing rock excavation as defined above, the CONTRACTOR may utilize blasting, power-operated hammers or other such equipment as necessary to accomplish the Work. The decision as to which means and methods shall be the responsibility of the CONTRACTOR.

4. Payment for performing rock excavation shall be as described in Section 00310 – Measurement and Payment. The CONTRACTOR shall keep a daily record of the amount of time expended performing rock excavation. This daily record shall be verified by the DISTRICT (or its representatives). The DISTRICT shall have final authority and discretion as to determination of the number of hours actually expended performing rock excavation.

5. Removal of boulders larger than 4 feet at their narrowest dimension shall be considered "rock excavation," if drilling and blasting, breaking them apart with a power-operated hammer or similar means is both necessary and actually utilized for their removal.

3.8 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. The CONTRACTOR shall remove and dispose of all excess excavated material at a site selected by the CONTRACTOR and approved by the DISTRICT.

B. The CONTRACTOR shall obtain all required permits, landowner, and agency approvals for disposal of excess excavated material and shall pay all costs associated with the removal and disposal.

3.9 BACKFILL – GENERAL

A. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around or upon any structure until the concrete has attained sufficient strength towithstand the loads imposed. Backfill around water retaining structures shall not be placed until the structures have been tested, and the structures shall be full of water while backfill is being placed.

B. Except for drain rock materials being placed in over-excavated areas or trenches, backfill shall be placed after all water is removed from the excavation.

C. Immediately prior to placement of backfill materials, the bottoms and sidewalls of trenches and structure excavations shall have all loose sloughing, or caving soil and rock materials removed. Trench sidewalls shall consist of excavated surfaces that are in a relatively undisturbed condition before placement of backfill materials.

3.10 PLACING AND SPREADING OF BACKFILL MATERIALS

A. Backfill materials shall be placed and spread evenly in layers not to exceed 8-inches in thickness.

B. During spreading, each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer. Pipe zone backfill materials shall be manually spread around the pipe so that when compacted the pipe zone backfill will provide uniform bearing and side support. Backfill material shall be placed into the void space in the haunches of the pipe by the use of hand tools such shovels and spades. The CONTRACTOR shall not rely upon the compactive effort of machinery to move the material into the void space.

C. Backfill material shall have a moisture content of optimum plus or minus 4 percent at the time of compaction. Where the backfill material moisture content is below the optimum moisture content, water shall be added before or during spreading until the proper moisture content is achieved. Where the backfill material moisture content is too high to permit the specified degree of compaction the material shall be dried until the moisture content is satisfactory.

3.11 COMPACTION OF FILL, BACKFILL, AND EMBANKMENT MATERIALS

A. Compaction by flooding, ponding, or jetting shall not be allowed.

B. Equipment weighing more than 10,000 pounds shall not be used closer to walls than a horizontal distance equal to the depth of the fill at that time. Hand operated power compaction equipment shall be used where use of heavier equipment is impractical or restricted due to weight limitations.

C. Backfill around and over pipelines that is mechanically compacted shall be compacted using light, hand operated equipment. After completion of at least two feet of compacted backfill over the top of pipeline, compaction equipment weighing no more than 8,000 pounds may be used to complete the trench backfill.

D. **Compaction Requirements:** The following compaction test requirements shall be in accordance with ASTM D1557 for Type A, B, C, G, H and K materials and in accordance with ASTM D4253 and D4254 for Type D, E, F, J and N materials.

Location or Use of Fill	Percentage of Maximum Density
Pipe zone backfill	90
Trench zone backfill, beneath paved areas or structures	95
Trench zone backfill, not beneath paved areas or structures	90
Final backfill, beneath paved areas or structures	95
Final backfill, not beneath paved areas or structures	90
Embankments and fills beneath paved areas or structures	95
Embankments and fills, not beneath paved areas or structures	90
Topsoil (Type K material)	80
Aggregate base (Type G material)	95

3.12 PIPE AND UTILITY TRENCH BACKFILL

A. **Pipe Zone Backfill:** The pipe zone is defined as that portion of the vertical trench crosssection lying between a plane 6-inches below the bottom surface of the pipe and a plane at a point 12-inches above the top surface of the pipe. The pipe zone shall be backfilled with the indicated backfill material. The CONTRACTOR shall exercise care to prevent damage to the pipeline coating, cathodic bonds, and the pipe itself during the installation and backfill operations.

B. **Trench Zone Backfill:** After the pipe zone backfill has been placed, backfilling of the trench zone may proceed. The trench zone is defined as that portion of the vertical trench cross-section lying as indicated between a plane 12-inches above the top surface of the pipe and a plane at a point 18 inches below the finished surface grade, or if the trench is under pavement, 18 inches below the roadway subgrade.

C. **Marking Tape Installation:** Marking tape shall be installed as indicated in the Drawings.

D. **Final Backfill:** Final backfill is all backfill in the trench cross-sectional area within 18 inches of finished grade, or if the trench is under pavement, all backfill within 18 inches of the roadway subgrade.

3.13 FILL AND EMBANKMENT CONSTRUCTION

A. The area where a fill or embankment is to be constructed shall be cleared of all vegetation, roots and foreign material. Following this, the surface shall be moistened, scarified to a depth of 6 inches, and rolled or otherwise mechanically compacted. Embankment and fill material shall be placed and spread evenly in approximately horizontal layers. Each layer shall be moistened or aerated, as necessary. Unless otherwise approved by the DISTRICT, each layer shall not exceed 6 inches of compacted thickness. The embankment, fill, and the scarified layer of underlying ground shall be compacted to 95 percent of maximum density under structures and paved areas, and 90 percent of maximum density elsewhere.

B. When an embankment or fill is to be made and compacted against hillsides or fill

slopes steeper than 4:1, the slopes of hillsides or fills shall be horizontally benched to key the embankment or fill to the underlying ground. A minimum of 12 inches normal to the slope of the hillside or fill shall be removed and re-compacted as the embankment or fill is brought up in layers. Material thus cut shall be re-compacted along with the new material at no additional cost to the DISTRICT. Hillside or fill slopes 4:1 or flatter shall be prepared in accordance with Paragraph A, above.

C. Where embankment or structure fills are constructed over pipelines, the first 4 feet of fill over the pipe shall be constructed using light placement and compaction equipment that does not damage the pipe. Heavy construction equipment shall maintain a minimum distance from the edge of the trench equal to the depth of the trench until at least 4 feet of fill over the pipe has been completed.

3.14 FIELD TESTING

A. **General:** All field soils testing shall be done by a testing laboratory of the DISTRICT's choice at the DISTRICT's expense except as indicated below.

B. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with Method C of ASTM D1557. Where cohesionless, free draining soil material is required to be compacted to a percentage of relative density, the calculation of relative density will be determined in accordance with ASTM D4253 and D4254. Field density in-place tests shall be performed in accordance with ASTM D1556, ASTM D2922, or by such other means acceptable to the DISTRICT.

C. In cases where the test of the fill or backfill shows non-compliance with the required density, the CONTRACTOR shall accomplish such remedy as may be required to insure compliance. Subsequent testing to show compliance shall be by a testing laboratory selected by the DISTRICT and shall be at no additional cost to the DISTRICT.

D. The CONTRACTOR shall provide test trenches and excavations including excavation, trench support, and groundwater removal for the DISTRICT'S field soils testing operations. The trenches and excavations shall be provided at the locations and to the depths required by the DISTRICT. All WORK for test trenches and excavations shall be provided at no additional cost to the DISTRICT.

* * END OF SECTION * *

SECTION 02315
STRUCTURE EXCAVATION AND FILL

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor necessary to complete earthwork for construction of interior and exterior Structural work as shown on the Structural Drawings. The Work of this Section includes, but is not necessarily limited to the following:

1. Over-excavation to remove loose and clayey materials under foundations and slabs-ongrade.

2. Over-excavation to remove soft soil, if required.

3. Furnish and place select engineered fill under footings and slabs-on-grade to replace clayey materials.

4. Foundation excavation and re-compaction.

5. Backfilling of all foundations.

6. Furnish and place sand and aggregate base under slabs-on-grades.

7. Quality control.

1.2 WORK EXCLUDED

A. The work of this section is limited to excavation work performed explicitly for structural work as shown in the structural drawings. All other work including, but not limited to, earthwork for trenching, paving and final grade shall be completed in accordance with Section 02200 – Earthwork.

1.3 RELATED WORK

A. The Work of this Section shall be closely coordinated with that of:

1. Section 03300 – Cast-in-Place Concrete Forming

2. Section 03310 – Structural Concrete

3. Section 04200 – Concrete Unit Masonry

4. Division 15 – Mechanical

5. Division 16 – Electrical

1.4 MATERIAL TESTING

A. All soils testing of samples submitted by the CONTRACTOR shall be done by a testing laboratory of the District's choice and at the District's expense. At its discretion,

the District may request that the CONTRACTOR supply samples for testing of any material used in the work.

B. Particle size analysis of soils and aggregates shall be performed using ASTM D422.

C. Determination of sand equivalent value shall be performed using ASTM D2419.

D. Unified Soil Classification System: References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D2487. The CONTRACTOR shall be bound by all applicable provisions of said ASTM D2487 in the interpretation of soil classifications.

E. The testing for chloride, sulfate, resistivity, and pH shall be done in accordance with California Test Method 643 of the California Department of Transportation.

1.5 CONDITION OF THE SITE

A. Prior to start of this Work, all rough grading and construction of site preparation for the building pad will be completed and building pad shall be constructed to subgrade elevation. Refer to Site Civil Drawings and Specification Section.

B. Information shown on the Drawings regarding existing site conditions is believed to be correct, but is not guaranteed. CONTRACTOR shall visit the site prior to the bid date, for the necessary information and data regarding present ground levels, conditions of the property, location and size of obstructions, and location of adjacent streets, buildings, etc.

C. Site improvements shall be located by the CONTRACTOR.

D. See Site Plan for information regarding limits of the construction work area.

1.6 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. Excess materials from over-excavation under footings and slabs-on-grade shall be legally disposed of off-site.

1.7 PROTECTION

A. The CONTRACTOR shall provide, install, and maintain all barricades, shoring, bracing, etc., as required by Federal, State, and local codes.

B. Protect the bottom of excavations and the soil around and beneath foundations from frost.

C. Protect existing streets, utilities, and other features or facilities on or adjacent to the site from damage from the Work of this Section, where such items are to remain. Any damage to the above shall be immediately repaired by the CONTRACTOR at no cost to the District, in a manner approved by the DISTRICT and/or authorities having jurisdiction.

1.8 GROUND WATER

A. Grade around excavations to prevent surface water run-off into the excavated areas.

B. Do not allow water to stand on or near the construction area at any time during the progress of the Work. Keep all excavations free of seepage, overflow, and standing water at all times by use of pumps or natural drainage.

C. Should rainfall or snow occur following the footing excavations and prior to pouring footings, the excavation shall be thoroughly dried and the base materials re-compacted prior to placing footings.

D. In no case shall concrete be deposited in any excavation unless such excavations are free of water.

1.9 EXCAVATION VARIANCES

A. Some areas of soft or unsuitable soils may be encountered at subgrade elevation. The DISTRICT shall inspect all areas after excavation to subgrade to determine suitability of soils. In the event that soft or unacceptable soils are encountered, the DISTRICT shall issue instructions to the CONTRACTOR for re-work and replacement of unacceptable materials.

B. Notify the DISTRICT immediately if other abnormal or questionable soil conditions are encountered, and do not proceed with the Work without the DISTRICT's acceptance.

C. Procedures are as follows:

1. Additional Excavation: When soil nature is such that good bearing cannot be found at subgrade levels indicated, DISTRICT may decide that additional excavation to good bearing soil is necessary. Any changes will be ordered in writing. Should additional excavation be necessary, lower grades will be additionally paid for at a price negotiated prior to the start of work, but based only upon work required between indicated grades and authorized grades.

2. Unauthorized Excavation: Where excess or unauthorized excavation takes place beyond indicated lines, grade and fill at no extra cost to the District to the indicated sub-grades with interior or exterior fill in accordance with the provisions of this Section.

PART 2 – PRODUCTS

2.1 FILL AND BACKFILL

A. All fill under footings and interior slabs-on-grade shall be select material meeting the requirements of Paragraph 2.1.C.

B. Native on-site materials, free of organic materials, rocks greater than 6 inches in diameter, and debris are acceptable for use as backfill only on the exterior side of foundation walls.

C. Imported material shall be approved by the DISTRICT prior to delivery to the site. Imported fill material shall be classified as follows:

SIEVE SIZE	PERCENT PASSING
4 inch	100
3/4 inch	70 – 100
No. 40	15 – 70
No. 200	5 – 20

Liquid Limit - 35 Maximum.
Plastic Index - 12 Maximum.

D. Material shall be readily compactible with small equipment.

2.2 BASE MATERIALS

A. Material for use as base under slabs-on-grade shall be a select granular crusher-run material free of all trash, debris, and clay particles, which conforms to Caltrans Class 2, Aggregate Base. Material shall meet the following requirements:

SIEVE SIZE	PERCENT PASSING
1 inch	100
3/4 inch	90 – 100
No. 4	35 – 65
No. 16	15 – 40
No. 200	2 – 10

	REQUIREMENT	TEST METHOD
Liquid Limit	35 Maximum	ASTM D 4318
R Value	70 Minimum	ASTM D 2844
Percentage of Wear	45% Maximum	ASTM C 131
Plasticity Index	12 Maximum	
Fractured Faces	35% Minimum	NEV T230

PART 3 – EXECUTION

3.1 PREPARATION AND LAYOUT

A. Identify required lines, levels, contours, and datum. Protect and maintain all control monuments and stakes. If it is necessary to disturb existing bench marks or stakes, they shall be reestablished under the Work of this Section.

3.2 BUILDING PAD

A. Verify building pad has been constructed and compacted in accordance with the Civil Drawings.

B. Pad should be graded to a subgrade elevation of +0.05 feet.

3.3 SITE CLEARING

A. See Section 02100 - Site Preparation.

3.4 EXCAVATION GENERAL

A. Loose material in the bottom of footing excavations shall be completely removed from the excavation prior to placing forms or reinforcing.

B. After footing excavation and prior to placing forms for footings, the area under footings shall be re-compacted to 95% maximum dry density as determined by ASTM D 1557.

C. Excavate to lines, grades, and dimensions indicated or otherwise required to accommodate the Work:

1. Excavation shall extend a sufficient distance from the walls to allow for placing and removal of forms, placing reinforcing, installation of services, and for inspection.

2. Sides of footings may be formed or excavated neat. See Neat Excavations.

3. Footings shall be cut square, smooth, and with level bottoms. Sides of footings shall be formed.

4. Excavations shall have embankment slopes not steeper than one horizontal to one vertical, or as necessary to insure bank stability.

D. Do not excavate below or within a 2:1 line extending outward and downward from the outside edge footings unless specifically shown on the Drawings.

3.5 RECOMPACTION AT FOOTINGS

A. After footing excavations and prior to placing forms for footings, the area under footings shall be re-compacted to 95% maximum dry density as determined by ASTM D 1557.

3.6 NEAT EXCAVATIONS

A. Neat excavations may be used for foundations provided:

1. Sides of excavations shall be cut vertical and bottom corners shall be essentially square. Rounded loose corners are not acceptable.

2. Excavation width shall be 4 inches wider than shown on the Drawings (i.e. 2 inches each side of footing).

3. Adequate devices are provided to support reinforcing and to accurately maintain location of embedded items during concrete placement.

4. Must be able to readily remove loose soils that accumulate during placement of reinforcing, prior to concrete placement.

3.7 FILLING AND BACKFILLING

A. Remove water from areas to receive fill and backfill before commencing work and keep areas free of water during filling and compaction.

B. Use only approved imported materials, free of vegetation and debris, for filling and backfilling under building.

C. Ensure that areas to be filled, or backfilled, are free from debris, snow, ice, and water, and that ground surfaces are not in a frozen condition. Frozen fill shall not be used, nor shall fill be placed on frozen ground.

D. In-place fills that are frozen, or excessively wet, shall be removed and re-worked prior to the placement of any additional fill.

E. Do not fill or backfill over existing subgrade surfaces which are porous, wet, or spongy without Architect's approval.

F. Fill or backfill to indicated grades, contours, levels, and elevations.

G. Place all fill and backfill material under building in 6 inch maximum compacted lifts, bring to optimum moisture, and compact to 95% maximum dry density as determined by ASTM D 1557.

H. Place all fill in non-structural areas, or areas not receiving any site improvements, in 8 inch compacted lifts; bring to optimum moisture and compact to 85% maximum dry density as determined by ASTM D 1557.

I. Backfill simultaneously on each side of foundation walls to equalize soil pressures and prevent over-stressing of walls.

J. Request Compaction Test after each lift is placed.

3.8 COMPACTION

A. Compaction as specified shall be obtained using suitable equipment specifically designed for the specified work. The CONTRACTOR shall be responsible for selecting the type of equipment to be used, except that the DISTRICT may suggest that alternate types of equipment be used if the methods employed by the CONTRACTOR do not produce the desired compaction.

B. Compaction of each layer shall be continuous over the entire area of the fill.

3.9 SUBGRADE PREPARATION

A. Subgrade shall be prepared under the Civil Specifications to within +0.05 feet.

B. Prior to placing aggregate base, moisture condition and re-compact subgrade to 95% density per ASTM D 1557.

3.10 CONCRETE SLAB-ON-GRADE BASE

A. Provide aggregate base compacted to a depth of not less than six inches under all interior concrete slabs-on-grade. Before placing the base, smooth and level the surface of the building pad, and thoroughly re-compact as required in this Section.

B. Place base in one compacted lift, bring to optimum moisture and compact to 95% maximum dry density as determined by ASTM D 1557.

C. Finished surface shall be to the indicated elevations within a tolerance of plus 1/4 inch or minus 1/2 inch.

D. Prior to pouring concrete, base fill shall be cleaned of debris, tested with a scratch board, high spots removed, and moistened to prevent suction.

3.11 SITE GRADING

A. See Section 02200 – Earthwork for site excavation and preparation of site improvements.

3.12 WEATHER PROTECTION

A. Earthwork shall not be performed during inclement weather, or when excessive moisture is present in the fill material.

3.13 COMPLETION

A. Upon completion of work, remove excess materials, equipment, apparatus, tools and the like; and leave premises clean, neat, and orderly.

* * END OF SECTION * *

SECTION 02460
A.C. PAVEMENT AND BASE

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide asphalt concrete pavement and base, complete and in place, in accordance with the Contract Documents.

B. Asphalt concrete pavement shall be plant-mixed asphalt concrete and shall conform to the requirements of this Section.

1.2 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

B. The CONTRACTOR shall submit materials testing reports and other pertinent information certifying that the AC pavement conforms to the requirements of the Contract Documents.

C. **Suitability Tests of Proposed Materials:** Tests for conformance with the Specifications shall be performed prior to start of the WORK. Results of all tests shall be submitted to the DISTRICT for approval. Materials to be tested shall include aggregate base, coarse and fine aggregate for paving mixtures, mineral filler, and asphalt cement.

PART 2 – PRODUCTS

2.1 AGGREGATE BASE

A. Aggregate base shall conform to the requirements given for Class 2 aggregate base in Section 26 of the Standard Specifications.

2.2 TACK COAT

A. Tack coat shall be bituminous binder (SS-1H) or AR-1000 paving asphalt.

2.3 PLANT MIXED ASPHALT

A. Asphalt concrete shall be Caltrans ½" Maximum, Medium (Type B) with PG 64-28 Asphalt Binder or an approved equal.

2.4 PAVEMENT MARKING PAINT

A. Pavement marking paint shall be a product specifically formulated for use on asphalt concrete pavement and shall have a proven record of performance and durability.

2.5 ASPHALT EMULSION PAINT BINDER

A. Asphalt emulsion paint binder shall be Grade SS-1, as specified in Section 94 of the Standard Specifications.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION

A. The subgrade shall be prepared in accordance with Section 02200 - Earthwork as applicable to roadways and embankments. The surface of the subgrade after compaction shall be hard, uniform, smooth and true to grade and cross-section. Subgrade for pavement shall not vary more than 0.02-foot from the indicated grade and cross section. Subgrade for base material shall not vary more than 0.04-foot from the indicated grade and cross section.

3.2 AGGREGATE BASE

A. Aggregate base shall be provided where indicated to the thickness indicated. Placement of aggregate base shall conform to the requirements of Section 26 of the Standard Specifications.

3.3 SAWCUTTING FOR FINAL PAVEMENT RESTORATION

A. Prior to placement of the permanent AC pavement, the existing pavement shall be sawcut or milled to provide a clean, straight edge free of damaged AC. The line to be sawcut shall be determined by the DISTRICT in cooperation with the Town of Truckee, Nevada County or Placer County as appropriate. The CONTRACTOR shall provide adequate notice to allow the DISTRICT to determine the area to be repaved.

3.4 TACK COAT

A. A tack coat shall be applied to existing paved surfaces where new asphalt concrete is to be placed on existing pavement. It shall also be applied to the contact surfaces of all cold pavement joints, curbs, gutters, manholes and the like immediately before the adjoining asphalt pavement is placed. Care shall be taken to prevent the application of tack coat material to surfaces that will not be in contact with the new asphalt concrete pavement. Tack coat asphalt shall be spray-applied at the rate of approximately 0.05 gal/sq yd.

3.5 ASPHALT CONCRETE

A. Asphalt concrete shall not be placed when the atmospheric temperature is below 10˚ C or during unsuitable weather.

B. The asphalt concrete shall be evenly spread upon the base to such a depth that, after rolling, it will be of the required cross section and grade of the course being constructed.

C. Spreading, once commenced, shall be continued without interruption.

3.6 PAVEMENT MARKING

A. Prior to removing any existing asphalt, the DISTRICT, the CONTRACTOR and the agency or party that owns the pavement to be disturbed shall meet on-site to discuss the amount of pavement to be removed. After the proposed pavement removal has been approved, the CONTRACTOR may commence sawcutting of the pavement to

accommodate construction. This meeting shall occur after the existing utilities have been marked through the USA process and telephone calls to the Town of Truckee and Caltrans.

* * END OF SECTION * *

SECTION 02565 - DUCTILE IRON PIPE

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide ductile iron pipe, fittings, specials and all appurtenant work, complete in place, in accordance with the Contract Documents.

B. **Use of Ductile Iron and PVC Pipe:**

1. Throughout the Contract Drawings, where new pipeline installations are indicated as "New Water Pipe," the CONTRACTOR may utilize either ductile iron pipe conforming to the requirements of this Section, or PVC pipe conforming to the requirements of Section 02597 – PVC Pressure Pipe.

2. In some cases, pipe material is specified as ductile iron or PVC only. In those installations, the specific pipe material indicated shall be used and substitutions shall not be allowed.

3. In some cases, alternate alignments are indicated for ductile iron and PVC pipe as a result of differences in the pipe materials. In those installations, the specific pipe material indicated for a given alignment shall be used for that alignment.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ASTM A307	Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A536	Ductile Iron Castings
ASTM C150	Portland Cement
AWWA C104	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C110	Ductile-Iron and Gray-Iron Fittings, 3-in. Through 48-in., for Water
AWWA C111	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115	Flanged Ductile-Iron Pipe with Ductile Iron or Gray-Iron Threaded Flanges
AWWA C150	Thickness Design of Ductile-Iron Pipe
AWWA C151	Ductile-Iron Pipe, Centrifugally Cast, for Water
AWWA C153	Ductile-Iron Compact Fittings for Water Service
AWWA C219	Bolted, Sleeve-Type Couplings for Plain-End Pipe
AWWA C550	Protective Epoxy Interior Coatings for Valves and Hydrants
AWWA C600	Installation of Ductile Iron Water Mains and Their Appurtenances

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

B. The CONTRACTOR shall submit the following information:

1. Catalog cuts of pipe, fittings and specials indicating the size, manufacturer, end joints, lining and coating and pressure rating.

2. Catalog cuts of pipeline marking tape indicating the size, color, manufacturer and material.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Mortar-lined ductile iron pipe shall conform to AWWA C104 and C151. Pipe shall be pressure class 350, with a diameter as shown in the Drawings. Pipe shall be furnished complete with all necessary rubber gaskets, specials and fittings as required under the Contract Documents.

B. Pipe materials shall conform to the requirements of AWWA C151.

C. **Handling and Storage:** The pipe shall be handled by devices acceptable to the DISTRICT, designed and constructed to prevent damage to the pipe coating/exterior. The use of equipment which might injure the pipe coating/exterior will not be permitted. Stockpiled pipe shall be suitably supported and shall be secured to prevent accidental rolling. All other pipe handling equipment and methods shall be acceptable to the DISTRICT.

D. **Laying Lengths:** Maximum pipe laying lengths shall be 20 feet with shorter lengths provided as required by the Drawings.

E. **Closures and Correction Pieces:** Closures and correction pieces shall be provided as required so that closures may be made due to different headings in the pipe laying operation and so that correction may be made to adjust the pipe laying to conform to pipe stationing shown on the Drawings. The locations of correction pieces and closure assemblies shall be acceptable to the DISTRICT.

2.2 FITTINGS AND SPECIALS

A. Fittings for ductile iron pipe shall conform to the requirements of AWWA C153 or AWWA C110. Fittings shall have a minimum pressure rating of 250 psi. Flanged cast iron fittings with a pressure rating of 150 psi shall not be used. Fittings shall be either cement-mortar lined and asphalt coated as described in this specification, or epoxy lined and coated in accordance with AWWA C550.

B. The pressure rating of fittings shall be stamped or cast directly on the exterior of the fitting by the manufacturer. Any fittings where the pressure rating has not been so indicated shall be rejected by the DISTRICT and removed from the site.

C. Restrained joints at fittings and specials shall be as described in Article 2.3 of this Specification.

D. Sleeve couplings shall conform to the requirements of AWWA C219. Sleeve and end rings shall conform to ASTM A536 and shall be epoxy lined and coated in accordance with AWWA C550. Gaskets shall conform to AWWA C219. Sleeve couplings shall have a pressure rating of no less than 250 psi and shall be clearly marked with the rated

pressure. The following products are acceptable for sleeve couplings sized 2-inch to 12-inch:

1. Romac Industries, Inc., Style 501

2. Smith-Blair, Product 441

3. Ford Meter Box Company, Inc., Style FC1

4. or approved equal.

E. Flanged coupling adapters shall conform to the requirements of AWWA C219. Flanged body and end rings shall conform to ASTM A536 and shall be epoxy lined and coated in accordance with AWWA C550. Gaskets shall conform to AWWA C219. CONTRACTOR shall be responsible for matching bolt patterns of flanged coupling adapter with connecting pipe or appurtenances. Flanged coupling adapters shall have a pressure rating of no less than 200 psi and shall be clearly marked with the rated pressure. The following products are acceptable for flanged coupling adapters sized 3-inch to 12-inch:

1. Romac Industries, Inc., Style “FCA501”

2. Dresser, Style 227

3. Smith-Blair, Product 912

4. or approved equal

F. Specials shall be as indicated in the Drawings.

G. **Nuts and Bolts:**

1. Nuts and bolts for flanges and T-bolts for mechanical joint fittings shall be ASTM A307, Grade A or B carbon steel. Nuts and bolts shall be factory hot-dip galvanized, zinc-plated, epoxy-coated or fluoropolymer-coated. Bare carbon steel shall not be allowed. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. The nuts shall be capable of developing the full strength of the bolts. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads.

2. For items that are packaged from the factory with bare carbon steel nuts and bolts, the factory provided items shall be replaced with nuts and bolts of equal or better strength that conform to the coating requirements of this Section. The application of coatings or paints in the field by brush or spray shall not be adequate to satisfy the requirements of this Section.

3. Uncoated nuts and bolts made of high-strength low-alloy steel conforming to the requirements of ASTM A242 or ASTM A588 shall be allowed provided that there is a grade marking applied to the item at the factory. In order to be acceptable, the DISTRICT must be able to confirm the type of steel by a simple visual inspection of an assembled joint. The application of a manufacturer’s insignia alone shall not be acceptable.

a. Romac has submitted documentation to the DISTRICT confirming that uncoated bolting materials supplied with Romac products conform to the requirements of ASTM A242 or ASTM A588. Uncoated bolting materials included inside factory sealed packages from Romac shall be acceptable even though they do not include a grade marking.

b. The acceptance of uncoated and unmarked bolting materials shall apply to bolting materials supplied by Romac only. Uncoated bolting materials supplied with products by other manufacturers shall be subject to the full requirements of this Section.

4. The requirements for nuts and bolts given in this Article shall also apply to threaded rods, carriage bolts, studs and any similar items used to construct water system piping in a buried application.

5. In the event that the CONTRACTOR proposes to supply fastener materials that do not comply with the above requirements, the CONTRACTOR shall note this non-conformance in the Shop Drawing submittal. The DISTRICT shall consider such submittals on a case-by-case basis.

2.3 JOINTS

A. **Joint Design:** Ductile iron pipe and fittings shall be furnished with mechanical joints, push-on joints, flanged joints, and restrained joints, as required.

1. Mechanical joints and push-on joints shall conform to AWWA C111.

2. Flanged joints shall conform to AWWA C115.

3. Restrained joints shall be made up using one of the following:

a. “Field-Lok" gaskets by U.S. Pipe

b. “Gripper” gaskets by Gripper Gasket Company

c. Wedge-type retainer glands - EBAA “Megalug”, EBAA “Megaflange”, Sigma “One-Lok”, or Stargrip Series 3000

d. “One-Bolt” fittings by One Bolt Incorporated

e. “GripRing” Pipe Restraints by Romac Industries.

f. Foster Adaptors by Infact Corporation

g. Restraint harnesses - EBAA Series 1100 HD or EBAA Series 1700

h. MJ Field Lok Restraints by US Pipe

B. **Joint Restraint**: Joints at all fittings and valves shall be restrained. Wherever possible, the CONTRACTOR shall install full lengths of pipe (18 feet long minimum) on either side of fittings and valves. Straight runs of pipe on either side of a fitting shall be restrained by one of two methods.

1) The CONTACTOR may pour concrete thrust blocks as indicated in the Contract Documents.

2) The CONTRACTOR may restrain in-line pipe joints by the use of methods indicated in this Section.

a. For an elbow, the table below gives the length of pipe in feet on each side of the elbow that the pipe joints must be restrained.

	Pipe Diameter								
Elbow	4”	6"	8"	10"	12"	14”	16”	20”	24”
11.25°	2	3	4	4	5	6	7	9	10
22.5°	4	6	7	9	11	13	14	17	20
45°	9	12	16	19	22	27	30	36	42
90°	22	29	38	46	53	64	72	86	100

b. For a tee, the table below gives the length of pipe in feet on the branch run that the pipe joints must be restrained. The pipe along the through run may be unrestrained, provided that another nearby fitting does not require restrained pipe as indicated in the Contract Documents.

Fitting	Required Length of Restrained Pipe for Branch Run
8” x 8” x 4” Tee	5 feet
8” x 8” x 6” Tee	35 feet
8” x 8” x 8” Tee	59 feet
10” x 10” x 4” Tee	0 feet
10” x 10” x 6” Tee	28 feet
10” x 10” x 8” Tee	54 feet
10” x 10” x 10” Tee	76 feet
12” x 12” x 4” Tee	0 feet
12” x 12” x 6” Tee	21 feet
12” x 12” x 8” Tee	49 feet
12” x 12” x 10” Tee	72 feet
12” x 12” x 12” Tee	92 feet
14” x 14” x 4” Tee	0 feet
14” x 14” x 6” Tee	12 feet
14” x 14” x 8” Tee	33 feet
14” x 14” x 10” Tee	51 feet
14” x 14” x 12” Tee	66 feet
14” x 14” x 14” Tee	81 feet
16” x 16” x 4” Tee	0 feet
16” x 16” x 6” Tee	7 feet
16” x 16” x 8” Tee	30 feet
16” x 16” x 10” Tee	47 feet
16” x 16” x 12” Tee	64 feet
16” x 16” x 14” Tee	79 feet
16” x 16” x 16” Tee	93 feet

c. For a dead end pipe run with either an end cap or plug, the table below gives the length of pipe in feet from the end cap or plug that the pipe joints must be restrained.

	Pipe Diameter								
Dead End	4”	6"	8"	10"	12"	14”	16”	20”	24”
End Cap	42	61	79	96	112	128	144	172	201
Plug	42	61	79	96	112	128	144	172	201

C. For bell-and-spigot ends with rubber gaskets, the clearance between the bells and spigots shall be such that when combined with the gasket groove configuration and the gasket itself, will provide watertight joints under all operating conditions when properly installed.

D. **Flange Gaskets:** Gaskets for flanged joints shall be full-faced, 1/8-inch thick synthetic rubber conforming with AWWA C115. Gaskets shall be either full face or ring gaskets with integral ribs. Flat ring gaskets shall not be acceptable. Gaskets shall be rated for long-term exterior above-grade installation by the manufacturer.

2.4 CEMENT-MORTAR LINING

A. **Cement-Mortar Lining for Shop Application:** Interior surfaces of all ductile iron pipe, fittings, and specials shall be cleaned and lined in the shop with cement-mortar lining applied centrifugally in conformity with AWWA C104. During the lining operation and thereafter, the pipe shall be maintained in a round condition by suitable bracing or strutting. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the damaged or unsatisfactory portions shall be replaced with lining conforming to these Specifications.

B. **Cement:** Cement for mortar lining shall be Type V conforming to the requirements of AWWA C104. Cement shall not originate from kilns that burn metal-rich hazardous waste fuel, nor shall fly ash or pozzolan be used as a cement replacement.

C. The minimum lining thickness shall be as follows:

Nominal Pipe Diameter (in)	Minimum Lining Thickness (in)
3-12	1/8
14-24	3/16

D. **Protection of Pipe Lining/Interior:** All shop-applied cement mortar lining shall be given a seal coat of asphaltic material in conformance with AWWA C104.

2.5 EXTERIOR COATING

A. **Exterior Coating of Buried Piping:** The exterior coating shall be an asphaltic coating approximately 1 mil thick.

2.6 PIPELINE MARKING TAPE

A. Pipeline marking tape shall have a minimum thickness of 5 mils, and shall be impervious to alkalis, acids, chemicals and solvents. Tape shall have a 50-gauge solid aluminum foil core laminated between two layers of inert plastic film. Tape shall have a minimum width of three inches and a minimum tensile strength of 100 pounds per 3-inch wide strip.

B. Pipeline marking tape shall be colored blue and shall bear a continuously printed message in permanent black letters. Lettering shall be 1-inch tall and shall read “CAUTION – WATER LINE BURIED BELOW”.

2.7 PIPELINE LOCATOR WIRE

A. Pipeline locator wire shall be No. 10 AWG solid copper wire with THWN insulation. Splice connectors shall be rated for wet location/direct burial installation. All splices shall be covered with heat-activated shrink-wrap tubing or heavy mastic tape to create a watertight connection.

2.8 THRUST AND ANCHOR BLOCKS

A. Thrust and anchor blocks shall be constructed of portland cement concrete as specified in Section 90 of the Standard Specifications. The minimum 28-day compressive strength shall be 2,000 psi (14 MPa). Maximum aggregate size shall be 1-1/2 inch (37.5 mm) and maximum slump shall be 4 inches (10 mm). Air entrainment is not required.

PART 3 -- EXECUTION

3.1 INSTALLATION OF PIPE

A. **Handling and Storage:** All pipe, fittings and specials shall be carefully handled and protected against damage, impact shocks, and free fall. All pipe handling equipment shall be acceptable to the DISTRICT. Pipe shall not be placed directly on rough ground but shall be supported in a manner that will protect the pipe against injury whenever stored at the trench site or elsewhere. No pipe shall be installed where the lining or coating shows defects that may be harmful as determined by the DISTRICT. Such damaged lining or coating shall be repaired, or a new undamaged pipe shall be furnished and installed.

B. All pipe damaged prior to Substantial Completion shall be repaired or replaced by the CONTRACTOR. Methods of repair shall be subject to approval by the DISTRICT.

C. The CONTRACTOR shall inspect each pipe and fitting prior to installation to insure that there are no damaged portions of the pipe.

D. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance, which may have collected thereon and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the WORK.

E. **Pipe Laying:** The pipe shall be installed in accordance with AWWA C600. Pipe shall be laid directly on the bedding material. Blocking shall not be permitted, and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Excavations shall be made as needed to facilitate removal of handling devices after the pipe is laid. Bell holes shall be formed at the ends of the pipe to prevent point loading at the bells or couplings. Excavation shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints.

F. Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the DISTRICT may change the alignment and/or the grades. Such changes shall be made by the deflection of joints or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum deflection recommended by the pipe manufacturer.

G. Except for short runs that may be permitted by the DISTRICT, pipes shall be laid uphill on grades exceeding 10 percent. Pipe that is laid on a downhill grade shall be blocked and held in place until sufficient support is furnished by the following pipe to prevent movement. All bends shall be properly installed as shown.

H. **Cold Weather Protection:** No pipe shall be installed upon a foundation into which frost has penetrated or at any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.

I. **Pipe and Specials Protection:**

a. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance, which may have collected thereon and shall be kept clean at all times thereafter. The openings of all pipe and specials shall be protected with suitable bulkheads to prevent unauthorized access by persons, animals, water or any undesirable substance.

b. The CONTRACTOR shall utilize plugs, caps or similar devices manufactured specifically for the purpose of sealing pipe ends. The use of plywood, traffic cones or other items not specifically intended for this use shall not be allowed. These protective devices shall be installed during any interruption to the WORK.

c. In the event that water, soil or other deleterious material enters the pipe, the CONTRACTOR shall take immediate steps to remove it. Such steps shall include sweeping, vacuuming, flushing, pigging or any other method necessary to clean the interior of the pipe to the satisfaction of the DISTRICT.

d. Trenches shall be kept free of water until joints have been properly made. The CONTRACTOR shall take all necessary precautions to prevent flotation of the pipe. Any pipe and fittings displaced by flotation shall be removed and reinstalled.

3.2 TRENCHING AND BACKFILL

A. Trench excavation and backfill shall conform to the requirements of Section 02200 - Earthwork.

3.3 CONNECTIONS TO EXISTING WATERLINES

A. Where the new Work is to be connected to existing pipelines, the CONTRACTOR shall make its arrangements with the DISTRICT a minimum of 4 working days in advance of the connections, to allow adequate time for dewatering of the existing line, if necessary, and shall expedite the work to minimize any water outages. Connections to existing pipelines that require an outage shall be scheduled on Tuesday, Wednesday or Thursday only.

B. If, in the opinion of the DISTRICT, the CONTRACTOR is not adequately prepared, does not have adequate manpower and equipment, or likely cannot complete the scheduled connection within the planned time, the DISTRICT may postpone the scheduled connection until a later date when the CONTRACTOR can be properly prepared. The CONTRACTOR shall not be entitled to any additional compensation if the Work cannot be performed due to the failure of the CONTRACTOR to adequately plan and staff the Work.

3.4 ANODE INSTALLATION

A. Anodes shall be installed on existing steel pipeline to remain in service, 4-inch in diameter and larger, at all locations where the coating of the steel pipeline has been cut, damaged, or removed during construction.

1. The CONTRACTOR shall perform all excavation and backfill work.

2. The DISTRICT shall furnish and install the anodes.

3. The CONTRACTOR shall contact the DISTRICT a minimum of 5 working days in advance, when feasible, to schedule the installation of the anode.

3.5 ASSEMBLY OF JOINTS WITH MECHANICAL DEVICES

A. All joints with mechanical devices (EBAA Mega-lugs, Sigma One-Loks, Romac Grip-Rings, etc.) shall be assembled in accordance with the manufacturer's recommendations using equipment and tools as recommended by the manufacturer.

B. The DISTRICT has no objection to the use of impact sockets (either pneumatic or electric), provided that they are acceptable to the manufacturer. In the event that the CONTRACTOR utilizes impact sockets to assemble joints, the CONTRACTOR shall have on-site, an adjustable torque-indicating wrench to verify that the torque settings of the impact socket are correct. Impact sockets **SHALL NOT** be used to tighten the torque-limiting twist-off nuts that secure the wedges on wedge-type retainer glands (EBAA Mega-lugs, Sigma One-Loks, etc.).

3.6 THRUST BLOCKS

A. Prior to placing thrust blocks, the CONTRACTOR shall wrap all bolts near the thrust block with protective plastic sheeting to prevent the bolts from being embedded within the concrete.

3.7 INSTALLATION OF MARKING TAPE AND LOCATOR WIRE

A. Marking tape shall be installed as indicated on the Drawings.

B. Locator wire shall be laid along the top of the pipe and held in place with nylon wire ties spaced not more than 5 feet apart. Additional nylon ties shall be located on each side of splices and where locator wire from side pipes joins the main pipe.

C. Locator wire shall be terminated in valve and service boxes as indicated on the Drawings.

3.8 FIELD TESTING AND DISINFECTION

A. Field testing and disinfection and water mains shall conform to the requirements of Section 02643 - Water Pipeline Testing and Disinfection.

3.9 ABANDONMENT OF EXISTING PIPELINES

A. The existing pipelines to be replaced under this Contract shall be abandoned by the CONTRACTOR. At the ends of pipelines to be abandoned, the existing pipeline shall be cut as necessary to accommodate installation of the new pipeline. The end of the pipeline to be abandoned shall then be plugged with lean concrete. The plug shall completely cover the end of the pipe and shall prevent the erosion of soil into the empty pipe cavity. Ready-mix concrete purchased in bags may be used.

– END OF SECTION –

SECTION 02597 - PVC PRESSURE PIPE

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish polyvinyl chloride (PVC) pressure pipe, complete in place, in accordance with the Contract Documents.

B. **Use of Ductile Iron and PVC Pipe:**

1. Throughout the Contract Drawings, where new pipeline installations are indicated as "New Water Pipe," the CONTRACTOR may utilize either ductile iron pipe conforming to the requirements of Section 02565 – Ductile Iron Pipe, or PVC pipe conforming to the requirements of this Section 02597.

2. In some cases, pipe material is specified as ductile iron or PVC only. In those installations, the specific pipe material indicated shall be used and substitutions shall not be allowed.

3. In some cases, alternate alignments are indicated for ductile iron and PVC pipe as a result of differences in the pipe materials. In those installations, the specific pipe material indicated for a given alignment shall be used for that alignment.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ASTM D2000	Classification System for Rubber Products in Automotive Applications
ASTM D2584	Test Method for Ignition Loss of Cured Reinforced Resins
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
AWWA C104	Cement-Mortar Lining for Ductile-Iron Pipe & Fittings for Water Pipe
AWWA C110	Ductile-Iron and Gray-Iron Fittings 3" Through 48" for Water
AWWA C219	Bolted, Sleeve-type Couplings for Plain End Pipe
AWWA C605	Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4-inch Through 12-inch for Water Distribution
AWWA M23	PVC Pipe – Design and Installation
UniBell B-13	Recommended Standard Performance Specification for Joint Restraint Devices for Use with Polyvinyl Chloride (PVC) Pipe

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

B. The CONTRACTOR shall submit the following information:

1. Catalog cuts of pipe, fittings and specials indicating the size, manufacturer, end joints, lining and coating and pressure rating.

2. Catalog cuts of pipeline marking tape indicating the size, color, manufacturer and material.

PART 2 -- PRODUCTS

2.1 GENERAL

A. PVC pressure pipe shall conform to the applicable requirements of AWWA C900 subject to additional requirements herein.

B. Pipe shall be of the nominal diameter indicated in the Drawings, with a DR-14 (305 psi) rating. Pipe shall be furnished complete with rubber gaskets and all other specials and fittings as required in the Contract Documents.

C. **Handling and Storage:** The pipe shall be handled by devices acceptable to the DISTRICT, designed and constructed to prevent damage to the pipe. The use of equipment which might injure the pipe will not be permitted. Stockpiled pipe shall be suitably supported and shall be secured to prevent accidental rolling. All other pipe handling equipment and methods shall be acceptable to the DISTRICT.

D. **Laying Lengths:** Maximum pipe laying lengths shall be 20 feet with shorter lengths provided as required by the Drawings.

E. **Closures and Correction Pieces:** Closures and correction pieces shall be provided as required so that closures may be made due to different headings in the pipe laying operation and so that correction may be made to adjust the pipe laying to conform to pipe stationing shown on the Drawings. The locations of correction pieces and closure assemblies shall be acceptable to the DISTRICT.

2.2 FITTINGS AND SPECIALS

A. Fittings for PVC pipe shall be ductile iron and shall conform to the requirements of Section 02565 – Ductile Iron Pipe.

B. Specials shall be as indicated in Section 02565 – Ductile Iron Pipe and as indicated on the Drawings.

2.3 JOINTS

A. **Joints:** Joints for buried PVC pipe shall be an integral bell and spigot manufactured on the pipe.

B. Joints at all fittings and valves shall be restrained. In addition, all joints located closer than 16 feet to a fitting or valve shall be restrained. Wherever possible, the CONTRACTOR shall install full lengths of pipe (18 feet long minimum) on either side of fittings and valves

C. **Restrained Joints:** Where required, restrained joints shall be made up with either thrust blocks or mechanical devices. Mechanical devices shall comply with the requirements of UniBell B-13. Mechanical devices for joint restraint shall be one of the following:

1. Wedge-type retainer glands –"EBAA Megalug", EBAA "Megaflange",Sigma "One-Lok" or Stargrip Series 4000.

2. "One-Bolt" fittings by One Bolt Incorporated

3. "GripRing" pipe restraints by Romac

4. Restraint harnesses - EBAA Iron Series 1500, Romac Series 600, Sigma "PV-Lok" or Star Series 1100C.

5. MJ Field Lok Restraints by US Pipe

D. **Joint Restraint**: Joints at all fittings and valves shall be restrained. Wherever possible, the CONTRACTOR shall install full lengths of pipe (18 feet long minimum) on either side of fittings and valves. Straight runs of pipe on either side of a fitting shall be restrained by one of two methods.

1. The CONTACTOR may pour concrete thrust blocks as indicated in the Drawings.

2. The CONTRACTOR may restrain in-line pipe joints by the use of methods indicated in this Section.

a. For an elbow, the length of pipe in feet on each side of the elbow that the pipe joints must be restrained is given in Section 02565, Article 2.3.B.2.a.

b. For a tee, the length of pipe in feet on the branch run that the pipe joints must be restrained is given in Section 02565, Article 2.3.B.2.b. The pipe along the through run may be unrestrained, provided that another nearby fitting does not require restrained pipe.

c. For a dead end pipe run with either an end cap or plug, the table below gives the length of pipe in feet from the end cap or plug that the pipe joints must be restrained is given in Section 02565, Article 2.3.B.2.c.

E. For bell-and-spigot ends with rubber gaskets, the clearance between the bells and spigots shall be such that when combined with the gasket groove configuration and the gasket itself, will provide watertight joints under all operating conditions when properly installed.

F. **Joint Deflection and Longitudinal Bending:** While installing PVC pipe, the CONTRACTOR may achieve minor offsets through the use of longitudinal bending. PVC pipe joints shall not be deflected to achieve offsets. The table below gives parameters for allowable bending of PVC pipe.

Pipe Size	Minimum Radius of Curvature, feet	Maximum Offset for a Single Piece of Pipe, inches
4-inch	100	24
6-inch	144	17
8-inch	188	13
10-inch	232	10
12-inch	275	9

2.4 PIPELINE MARKING TAPE

A. Pipeline marking tape shall conform to the requirements of Section 02565 – Ductile Iron Pipe.

2.5 PIPELINE LOCATOR WIRE

A. Pipeline locator wire shall conform to the requirements of Section 02565 – Ductile Iron Pipe.

2.6 THRUST AND ANCHOR BLOCKS

A. Thrust and anchor blocks shall conform to the requirements of Section 02565 – Ductile Iron Pipe.

PART 3 -- EXECUTION

3.1 GENERAL

A. Laying, jointing, testing for defects and for leakage shall be performed in the presence of the DISTRICT, and shall be subject to approval before acceptance. Material found to have defects will be rejected and the CONTRACTOR shall promptly remove such defective materials from the Site.

B. Installation shall conform to the requirements of AWWA M23, AWWA C605, instructions furnished by the pipe manufacturer, and to the supplementary requirements herein. Wherever the provisions of this Section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

3.2 HANDLING AND STORAGE

A. **Handling:** Pipe, fittings and accessories shall be carefully inspected before and after installation and those found defective shall be rejected. Pipe and fittings shall be free from fins and burrs. Before being placed in position, pipe, fittings, and accessories shall be cleaned, and shall be maintained in a clean condition. Proper facilities shall be provided for lowering sections of pipe and appurtenances into trenches. Under no circumstances shall pipe, fittings or any other material be dropped or dumped into trenches.

B. **Storage:** Pipe shall be stored, if possible, at the Site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression damage or deformation to bell ends of the pipe. Pipe shall be stored in such a way as to prevent sagging or bending and be protected from exposure to direct sunlight by covering with an opaque material while permitting adequate air circulation above and around the pipe. Gaskets shall be stored in a cool, dark place out of the direct rays of the sun, preferably in original cartons.

3.3 TRENCHING AND BACKFILL

A. Trench excavation and backfill shall conform to the requirements of Section 02200 - Earthwork.

3.4 INSTALLATION

A. Bell-and-spigot pipe shall be laid with the bell end pointing in the direction of laying. On slopes of 10 percent or greater, laying shall begin at the bottom of the slope and proceed upward. Pipe trenches shall be graded in straight lines, taking care to avoid the formation of any dips or low points.

B. Pipe shall not be laid when the conditions of trench or weather are unsuitable. Whenever pipe laying is discontinued, or at the end of each days work, open ends of pipe shall be closed temporarily with wood blocks or bulkheads. Blocks or bulkheads shall not be removed unless the trench is dry.

C. The pipeline vertical alignment shall maintain a minimum depth to the top of pipe as noted in the Drawings. The pipeline depth shall be increased as necessary to provide a minimum of 12-inches vertical clearance between the top of the pipe and any underground structure or utility. The depth shall also be increased as directed by the DISTRICT to allow the pipe to be installed without grade changes, to eliminate fittings, air release valves or blow-offs. Pipelines beneath other utilities shall be located so that the other utility is located as close as possible to the mid-point between pipe joints.

D. Pipe shall be supported at its proper elevation and grade, care being taken to secure firm and uniform support. Wood support blocking will not be permitted. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with recessed excavation to accommodate bells, joints, and couplings. Anchors and supports shall be provided where indicated and where necessary for fastening work into place. Fittings shall be independently supported.

E. Joints shall be installed according to manufacturer's recommendations. The maximum combined deflection at any joint shall be in accordance with the manufacturer's recommendations and these specifications, whichever is more restrictive. Pipe lengths shall be selected so that the pipe can be installed through horizontal or vertical curves, or any combination thereof, without exceeding the maximum allowable joint deflection.

F. **Pipe and Specials Protection:**

a. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance, which may have collected thereon and shall be kept clean at all times thereafter. The openings of all pipe and specials shall be protected with suitable bulkheads to prevent unauthorized access by persons, animals, water or any undesirable substance.

b. The CONTRACTOR shall utilize plugs, caps or similar devices manufactured specifically for the purpose of sealing pipe ends. The use of plywood, traffic cones or other items not specifically intended for this use shall not be allowed. These protective devices shall be installed during any interruption to the WORK.

c. In the event that water, soil or other deleterious material enters the pipe, the CONTRACTOR shall take immediate steps to remove it. Such steps shall include sweeping, vacuuming, flushing, pigging or any other method necessary to clean the interior of the pipe to the satisfaction of the DISTRICT.

d. Trenches shall be kept free of water until joints have been properly made. The CONTRACTOR shall take all necessary precautions to prevent flotation of the pipe. Any pipe and fittings displaced by flotation shall be removed and reinstalled.

G. Pipe shall be cut by means of saws, power driven abrasive wheels, or pipe cutters, which will produce a square cut. No wedge-type roller cutters will be permitted. After cutting, the end of the pipe shall be beveled using a beveling tool, portable type sander, or abrasive disc.

H. All pipe and fittings shall be properly restrained against horizontal and vertical movement due to internal pressure. Thrust blocks and anchor blocks shall be as indicated on the Drawings. No loads shall be imposed on thrust blocks or anchor blocks until the concrete has reached a minimum compressive strength of 2,000 psi.

3.5 CONNECTIONS TO EXISTING WATERLINES

A. Where the new Work is to be connected to existing pipelines, the CONTRACTOR shall make its arrangements with the DISTRICT a minimum of 4 working days in advance of the connections, to allow adequate time for dewatering of the existing line, if necessary, and shall expedite the work to minimize any water outages. Connections to existing pipelines that require an outage shall be scheduled on Tuesday, Wednesday or Thursday only.

B. If, in the opinion of the DISTRICT, the CONTRACTOR is not adequately prepared, does not have adequate manpower and equipment, or likely cannot complete the scheduled connection within the planned time, the DISTRICT may postpone the scheduled connection until a later date when the CONTRACTOR can be properly prepared. The CONTRACTOR shall not be entitled to any additional compensation if the Work cannot be performed due to the failure of the CONTRACTOR to adequately plan and staff the Work.

3.6 ANODE INSTALLATION

A. Anodes shall be installed on existing steel pipeline to remain in service, 4-inch in diameter and larger, at all locations where the coating of the steel pipeline has been cut, damaged, or removed during construction.

1. The CONTRACTOR shall perform all excavation and backfill work.

2. The DISTRICT shall furnish and install the anodes.

3. The CONTRACTOR shall contact the DISTRICT a minimum of 5 working days in advance, when feasible, to schedule the installation of the anode.

3.7 ASSEMBLY OF JOINTS WITH MECHANICAL DEVICES

A. All joints with mechanical devices (EBAA Mega-lugs, Sigma One-Loks, Romac Grip-Rings, etc.) shall be assembled in accordance with the manufacturer's recommendations using equipment and tools as recommended by the manufacturer.

B. The DISTRICT has no objection to the use of impact sockets (either pneumatic or electric) provided that they are acceptable to the manufacturer. In the event that the CONTRACTOR utilizes impact sockets to assemble joints, the CONTRACTOR shall have on-site, an adjustable torque-indicating wrench to verify that the torque settings of the impact socket are correct. Impact sockets **SHALL NOT** be used to tighten the torque-limiting twist-off nuts that secure the wedges on wedge-type retainer glands (EBAA Mega-lugs or similar items).

3.8 INSTALLATION OF MARKING TAPE AND LOCATOR WIRE

A. Marking tape shall be installed as indicated on the Drawings.

B. Locator wire shall be laid along the top of the pipe and held in place with nylon wire ties spaced not more than 5 feet apart. Additional nylon ties shall be located on each side of splices and where locator wire from side pipes joins the main pipe.

C. Locator wire shall be terminated in valve and service boxes as indicated on the Drawings.

3.9 THRUST BLOCKS

A. Prior to placing thrust blocks, the CONTRACTOR shall wrap all bolts near the thrust block with protective plastic sheeting to prevent the bolts from being embedded within the concrete.

3.10 FIELD TESTING AND DISINFECTION

A. Field testing and disinfection and water mains shall conform to the requirements of Section 02643 - Water Pipeline Testing and Disinfection

3.11 ABANDONMENT OF EXISTING PIPELINES

A. The existing pipelines to be replaced under this contract shall be abandoned by the CONTRACTOR. At the ends of pipelines to be abandoned, the existing pipeline shall be cut as necessary to accommodate installation of the new pipeline. The end of the pipeline to be abandoned shall then be plugged with lean concrete. The plug shall completely cover the end of the pipe and shall prevent the erosion of soil into the empty pipe cavity. Ready-mix concrete purchased in bags may be used.

- END OF SECTION -

SECTION 02641 – WATER SERVICE CONNECTIONS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide water service connections for meters 1-inch and smaller in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ANSI B1.20	National Pipe Tapered (NPT) standard for Tapered Threads
ANSI B16.15	Cast Bronze Threaded Fittings
ASTM A536	Ductile Iron Castings
AWWA C800	Underground Service Line Valves and Fittings
AWWA C901	Polyethylene (PE) Pressure Pipe and Tubing, 1/2" In. (13 mm) through 3 In. (76 mm) for Water Service
Section 116875	California Health and Safety Code (Lead Free Brass)

PART 2 -- PRODUCTS

2.1 SERVICE SADDLES FOR PVC AND DUCTILE IRON PIPE

A. Service saddles for PVC and ductile iron pipe shall have ductile iron bodies conforming to ASTM A536 suitable for a working pressure of 300 psi. Saddles shall be double-strap and straps shall have a minimum width of 1.5 inches. All hardware, including straps, studs, nuts and washers shall be Type 304 stainless steel. Saddles shall be **Smith-Blair Model 317**, **Romac Model 202N**, or approved equal.

B. For PVC pipe, saddles shall be sized such that the upper end of the OD range is equal to the outside diameter of the pipe. Acceptable part numbers are:

Pipe Size	1.5” Outlet Saddle	2” Outlet Saddle
4” PVC	Romac 202N - 4.80 x 1.5” IP or Smith Blair 317-048012-000	Romac 202N - 4.80 x 2” IP or Smith Blair 317-048014-000
6” PVC	Romac 202N – 6.90 x 1.5” IP or Smith Blair 317-069012-000	Romac 202N – 6.90 x 2” IP or Smith Blair 317-069014-000
8” PVC	Romac 202N – 9.05 x 1.5” IP or Smith Blair 317-090512-000	Romac 202N – 9.05 x 2” IP or Smith Blair 317-090514-000
10” PVC	Romac 202N – 11.10 x 1.5” IP or Smith Blair 317-111012-000	Romac 202N – 11.10 x 2” IP or Smith Blair 317-111014-000
12” PVC	Romac 202N – 13.20 x 1.5” IP or Smith Blair 317-132012-000	Romac 202N – 13.20 x 2” IP or Smith Blair 317-132014-000

2.2 POLYETHYLENE TUBING

A. Polyethylene tubing for water service lines shall meet the requirements of AWWA C901 and be made from compounds having standard code designation PE 3408.

B. The tubing shall be copper tube size (CTS) OD base with dimensions conforming to Table 7 of AWWA C901, Pressure Class 200(DR9). PE tubing shall beby Advanced Drainage Systems, JM Eagle, Interstate Plastic,Performance Pipe, WesflexPipe Manufacturingor approved equal.

C. Fittings for polyethylene tubing shall be brass compression type fittings and shall be as shown on the Drawings. Stainless steel insert stiffeners shall be used at all compression joints. Insert stiffeners shall be flared at one end and beveled at approximately 45° at the other end. Stiffeners shall be supplied by the fitting manufacturer.

2.3 THREADED FITTINGS AND NIPPLES

A. Threaded fittings and nipples shall be in accordance with ANSI B16.15. The body shall be of an alloy conforming to AWWA C800 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Fittings shall be designed for working pressures of 250 psi. Threads shall be NPT in compliance with ANSI B1.20. Threaded joints shall be made up with teflon tape.

2.4 CURB BALL VALVES

A. Curb ball valves shall conform to AWWA C800. The valve body shall be of an alloy conforming to AWWA C800 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Curb ball valves shall be designed for working pressures of 250 psi.

B. Female iron pipe x female iron pipe thread curb ball valves shall be:

Size	Curb Ball Valves
¾-inch	AY McDonald 76101W (3/4”) Ford B11-333-W-NL Mueller B-20200-3-N (3/4”)
1-inch	AY McDonald 76101W (1”) Ford B11-444-W-NL Mueller B-20200-3-N (1”)
2-inch	AY McDonald 76101W (2”) Ford Model B11-777-W-NL Mueller B-20200-3-N (2”)

No equals or substitutes will be accepted

2.5 CORPORATION BALL VALVES

A. Corporation ball valves shall conform to AWWA C800. The valve body shall be of an alloy conforming to AWWA C800 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Corporation ball valves shall be designed for working pressures of 250 psi. End connections shall be male iron pipe thread by compression. Stiffener inserts shall be used on the end of the polyethylene pipe at the compression end. Corporation ball valves and stiffener inserts shall be:

Size	Corporation Ball Valves	Stiffener Insert
1-inch	AY McDonald 74704BQ (1”) Ford FB-1100-4-Q-NL Mueller B-25028-N (1”)	AY McDonald 6133T (1”) Ford Insert-52 Mueller Liner 528705
1.5-inch	AY McDonald 74704BQ (1.5”) Ford FB-1100-6-Q-NL Mueller B-25028-N (1.5”)	AY McDonald 6133T (1.5”) Ford Insert-54-Q Mueller Liner 528706
2-inch	AY McDonald 74704BQ (2”) Ford FB-1100-7-Q-NL Mueller B-25028-N (2”)	AY McDonald 6133T (2”) Ford Insert-55-Q Mueller Liner 528707

No equals or substitutes will be accepted

2.6 COUPLINGS

A. Couplings shall conform to AWWA C800. The coupling body shall be of an alloy conforming to AWWA C800 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Couplings shall be designed for working pressures of 250 psi. Stiffener inserts shall be used on the end of the polyethylene pipe at the compression end.

B. Male iron pipe x compression couplings and stiffener inserts shall be:

Size	MIP Coupling	Stiffener Insert
1-inch	AY McDonald 74753Q (1”) Ford C84-44-Q-NL Mueller H-15428-N (1”)	AY McDonald 6133T (1”) Ford Insert-52 Mueller Liner 528705
1.5-inch	AY McDonald 74753Q (1.5”) Ford C84-66-Q-NL Mueller H-15428-N (1.5”)	AY McDonald 6133T (1.5”) Ford Insert-54-Q Mueller Liner 528706
2-inch	AY McDonald 74753Q (2”) Ford C84-77-Q-NL Mueller H-15428-N (2”)	AY McDonald 6133T (2”) Ford Insert-55-Q Mueller Liner 528707

No equals or substitutes will be accepted

C. Female iron pipe x compression couplings and stiffener inserts shall be:

Size	FIP Coupling	Stiffener Insert
1-inch	AY McDonald 74754Q (1”) Ford C14-44-Q-NL Mueller H-15451-N (1”)	AY McDonald 6133T (1”) Ford Insert-52 Mueller Liner 528705
1.5-inch	AY McDonald 74754Q (1.5”) Ford C14-66-Q-NL Mueller H-15451-N (1.5”)	AY McDonald 6133T (1.5”) Ford Insert-54-Q Mueller Liner 528706
2-inch	AY McDonald 74754Q (2”) Ford C14-77-Q-NL Mueller H-15451-N (2”)	AY McDonald 6133T (2”) Ford Insert-55-Q Mueller Liner 528707

No equals or substitutes will be accepted

2.7 DOUBLE METER INSTALLATIONS WITH METERS ¾-INCH AND SMALLER

A. **Precast Concrete Boxes:**For double meter installations with meters ¾-inch and smaller, boxes shall be precast concrete boxes with lids that are permanently marked with the term "WATER" or "WATER METER." In paved areas, areas subject to vehicular loading, or where deemed necessary by the DISTRICT, boxes rated for H-20 loading shall be provided. H-20 rated boxes shall have metal lids with bolting mechanisms to secure the lid and shall be furnished with bolts to secure the lid. Meters shall be equipped with meter yokes as indicated in the Drawings. Meter boxes for double meter installations shall be:

Location	Box	Extension	Lid
Non-Traffic Areas	Christy N40 Box	Christy B40x10	DFW B40C-4-LID
Traffic Rated Areas	Christy B2436 Box	Christy B2436x12	JTS JS2436-1015A
Traffic Rated Areas	Jensen HT2436-12 Box	Jensen HT2436X12	JTS JS2436-1015A

Approved equals shall be accepted

Meter yoke components shall be:

Item	Part Number
Meter yoke	AY McDonald 14-2 (5/8" x 3/4") Ford Y502 Mueller H-5020
Meter yoke expansion connection	AY McDonald 714-2ESG Ford EC-23-NL Mueller H-14234-N (3/4")
Straight yoke valve	AY McDonald 76101WY (3/4" x 3/4" x 02) Ford B91-323W-NL Mueller B-24360-N (5/8" x 3/4" x 3/4")

Approved equals shall be accepted

2.8 MULTIPLE METER INSTALLATIONS WITH METERS ¾-INCH AND SMALLER

A. For installations with three or more ¾-inch or smaller meters, boxes shall be precast concrete with lids that are permanently marked with the term "WATER" or "WATER METER." In paved areas, areas subject to vehicular loading, or where deemed necessary by the DISTRICT, boxes rated for H-20 loading shall be provided. H-20 rated boxes shall have metal lids with bolting mechanisms to secure the lid and shall be furnished with bolts to secure the lid. Meters shall be equipped with meter yokes as indicated in the Drawings. Meter boxes for three or four meter installations shall be:

Location	Box	Extension	Lid
Non-Traffic Areas	Christy N48T Box	Christy B48x10	DFW B48C-4-LID
Traffic Rated Areas	Christy B3048 Box	Christy B3048x12	JTS JS3048-1015
Traffic Rated Areas	Jensen HT3048-12 Box	Jensen HT3048X12	JTS JS3048-1015

Approved equals shall be accepted

Meter yoke components shall be:

Item	Part Number
Meter yoke	AY McDonald 14-2 (5/8” x 3/4”) Ford Y502 Mueller H-5020
Meter yoke expansion connection	AY McDonald 714-2ESG Ford EC-23-NL Mueller H-14234-N (3/4”)
Straight yoke valve	AY McDonald 76101WY (3/4” x 3/4” x 02) Ford B91-323W-NL Mueller B-24360-N (5/8” x 3/4" x 3/4")

Approved equals shall be accepted

2.9 METERS

A. For services that have existing meters, the CONTRACTOR shall transfer the existing meterfrom the existing meter boxes to the newly installed meter boxes. The CONTRACTOR shall note the serial number of the meter serving a given address and shall ensure that the meter is reinstalled in the proper location to serve that same address.

B. The DISTRICT shall provide the CONTRACTOR with meter idlers to be installed where a meter does not currently exist. The CONTRACTOR shall be responsible for performing all other work required by this specification section.

C. Reconnection of existing customers using idlers shall be sufficient for the CONTRACTOR to achieve final completion of the project.

2.10 PIPELINE LOCATOR WIRE

A. Pipeline locator wire shall conform to the requirements given in Section 02565 – Ductile Iron Pipe.

2.11 PIPELINE MARKING TAPE

A. Pipeline marking tape shall conform to the requirements given in Section 02565 – Ductile Iron Pipe.

2.12 INSULATING BLANKETS FOR PRECAST CONCRETE METER BOXES

A. Precast concrete meter boxes shall be furnished with insulation blankets to protect meters and piping from freezing. Insulating blankets shall have a minimum insulation thickness of 3/8” surrounded by layers of waterproof material. Insulating blankets shall have a minimum R value of 2.8 when tested in accordance with ASTM C518. Insulating blankets shall have minimum dimensions of 6’ x 10’ and shall be folded as necessary to fit within the concrete meter box. Field cutting of larger blankets to the minimum size shall be allowed, provided that field cut ends are sealed with waterproof adhesive tape. Insulating blankets shall be Model No. NRB6L by Midwest Canvas Corporation, or approved equal.

B. Single layer insulating blankets constructed of polyethylene shall not be allowed.

PART 3 -- INSTALLATION

3.1 GENERAL

A. Excavation and backfill shall conform to the requirements of Section 02200 – Earthwork.

B. Water service piping shall be tested in accordance with Section 02643 – Water Pipeline Testing and Disinfection.

3.2 SERVICE TAPS

A. Direct tapping of water mains shall not be permitted. Double-strap service saddles shall be used for all service connections. Service saddles shall have a bearing area of sufficient width along the axis of the pipe, so that the pipe will not be distorted when the saddle is made tight. An internal shell cutter shall be used to drill through the corporation stop to minimize shavings, retain the coupon, and reduce stress. Single fluted shell cutters or twist drills shall not be used. Cutting lubricant shall be used on the cutting and tapping edges of the tool.

3.3 HOT TAPS

A. All hot tapping of existing mains shall be performed by the DISTRICT, as indicated in Section 02642 – Hot Tap Connections.

3.4 SERVICE LATERALS

A. All service laterals shall be a continuous piece of polyethylene tubing from the main to the meter box. The CONTRACTOR shall not use couplings to splice together smaller pieces of tubing as a lateral installation.

3.5 INSTALLATION OF SERVICE LATERALS BY TRENCHLESS METHODS

A. Instead of open trenching, the CONTRACTOR may use moles, thumpers, directional drills, pipe extraction or other trenchless construction methods to install service laterals up to 2-inch in diameter. In such cases, the CONTRACTOR shall install a sleeve pipe using the trenchless methods and then pull the service lateral inside the sleeve. Sleeves shall be of a diameter and wall thickness adequate to allow pulling of the service lateral without resistance.

B. Prior to performing any trenchless construction, the CONTRACTOR shall submit to the DISTRICT information regarding the proposed equipment and methods to be employed. Such methods and equipment shall be subject to review and approval by the DISTRICT. The DISTRICT may also require that the CONTRACTOR perform a trial installation in order to confirm the viability of the proposed methods and equipment.

C. Any changes to the approved methodology shall be approved by the DISTRICT. In the event that the CONTRACTOR deviates from the approved methodology in a manner unacceptable to the DISTRICT, the DISTRICT will require the CONTRACTOR to discontinue the Work until a mutually agreeable procedure can be identified.

D. In the event that the DISTRICT approves a given methodology and the CONTRACTOR later chooses to install service laterals by a different method, or by open cut construction, the CONTRACTOR shall not be due any additional compensation.

3.6 ARRANGEMENT AND LABELING OF METER INSTALLATIONS

A. For multiple meter installations (two or more) with precast concrete boxes, the DISTRICT shall furnish to the CONTRACTOR a 3-1/2" x 2" laminated card indicating the street address of each customer served. The CONTRACTOR shall be responsible to attach the laminated card to the appropriate meter (or meter idler) using either zip-ties or rebar tie wire. The meters shall be arranged in sequential order corresponding to the arrangement of the units served by the meters. The order shall be either right-to-left or left-to-right and shall correspond to the address sequence of the given street. Irrigation meters shall be located at one end of the meter manifold. The CONTRACTOR shall take care when installing on-site piping to ensure that customer laterals are connected to the proper units. The CONTRACTOR shall not randomly connect the customer laterals to the meter manifold.

3.7 REMOVAL OF EXISTING METER BOXES AND HARDWARE

A. The CONTRACTOR shall excavate, remove and dispose of the existing concrete meter boxes.

B. The CONTRACTOR shall remove and dispose of all existing galvanized fittings and hardware from the meter box.

3.8 CONNECTION OF CUSTOMER SERVICE LATERALS

A. The CONTRACTOR shall be responsible to install PE tubing and couplings as necessary to connect the downstream side of the new meter box hardware to the existing customer service laterals. The size of the PE tubing shall be at least as large as the existing customer service lateral and shall be a minimum of 1-inch in diameter. The CONTRACTOR shall furnish and install an appropriate coupling to transition to the existing service. Such existing services are most likely copper or galvanized iron.

3.9 METER BOX LOCATING RODS

A. In order to facilitate location of meter boxes during the Winter, the CONTRACTOR shall fasten a 12-inch long piece of #4 steel reinforcing bar to the bottom of the composite meter box lid. The CONTRACTOR shall drill two 1/4" holes into ribs on the bottom of the lid and then attach the steel bar using zip-ties

– END OF SECTION –

SECTION 02643
WATER PIPELINE TESTING AND DISINFECTION

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall perform flushing, hydrostatic testing and disinfection of all pipelines and appurtenant piping, complete, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

AWWA B300 Hypochlorites

AWWA C651 Disinfecting Water Mains

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

B. The CONTRACTOR shall submit a proposed ***Testing and Disinfection Plan*** describing the proposed methods and schedule for water conveyance, cleaning, pressure testing, disinfection, and water disposal in writing for approval a minimum of five working days before testing is to start. The plan shall ensure that all environmental and permit restrictions regarding the disposal of water used for testing are addressed.

PART 2 – PRODUCTS

2.1 MATERIALS REQUIREMENTS

A. All test equipment, chemicals for chlorination, temporary valves, bulkheads, or other water control equipment and materials shall be selected and furnished by the CONTRACTOR subject to the DISTRICT's review.

B. Chlorine for disinfection may be in the form of sodium hypochlorite solution, or calcium hypochlorite granules or tablets.

C. Sodium hypochlorite and calcium hypochlorite shall be in accordance with the requirements of AWWA B300.

PART 3 – EXECUTION

3.1 GENERAL

A. Water for testing and disinfecting water pipelines will be furnished by the DISTRICT at the fire hydrant(s) described in Section 01505 - Mobilization. The CONTRACTOR shall make all necessary provisions for conveying the water from this location to the points of use.

B. The DISTRICT maintains a large detention basin. The capacity of this detention basin is about 1.5 million gallons. The CONTRACTOR may discharge water from the

testing and disinfection procedure into this basin for disposal by percolation and/evaporation. Any water discharged to the detention basin shall be dechlorinated to remove all chlorine present in the water. Water shall be discharged into the detention basin in a manner to prevent any erosion or damage to the detention basin. The CONTRACTOR shall be responsible for the means and methods used to convey water to the detention basin.

C. The DISTRICT has also obtained the necessary permits for disposal of mainline flushing water to the existing sanitary sewer system. AT NO TIME, shall the system be flushed to atmosphere and water be allowed to run along the ground. All flushed water shall be contained and piped to a manhole as directed by the DISTRICT or directed to the detention basin. If discharging to the sanitary sewer, the CONTRACTOR shall provide all necessary temporary holding tanks or other containment vessels to permit adequate flushing of the mainlines at adequate velocities until all measurable chlorine residual is less than or equal to 0.2 mg/L and the flushed water clear of all particulate matter. Flushing of all water mains and other appurtenances shall conform to the requirements of the applicable permits. The flushing sewer disposal rate is restricted due to the size of sewage facilities in the area. All disposal to the sanitary sewer shall be done at the maximum flow rate of 100 gallons per minute.

D. Disinfection shall be accomplished by chlorination. All chlorinating and testing operations shall be performed in the presence of the DISTRICT. Chlorination shall take place using either the Tablet Method or the Continuous Feed Method as outlined in AWWA C651. The Slug Method shall not be used.

E. Disinfection operations shall be scheduled by the CONTRACTOR as late as possible during the Contract Time period so as to assure the maximum degree of sterility of the facilities at the time the WORK is accepted by the DISTRICT.

3.2 PRESSURE TESTING, FLUSHING AND DISINFECTION PROCEDURE – CONTINUOUS FEED METHOD

A. The following procedure shall be used for pressure testing and disinfection using the Continuous Feed Method:

1. The CONTRACTOR shall submit and obtain approval of the written ***Testing and Disinfection Plan*** described above.

2. Perform and complete hydrostatic testing of the pipeline as described in Article 3.4

3. After successful completion of the hydrostatic pressure test, connect the new pipeline to the DISTRICT existing system using methods to be determined at one location. There must be an isolation valve at the point of interconnection.

4. Flush the new pipelines at a velocity of at least 5 fps to remove any foreign matter or debris that may have accumulated during construction.

5. Introduce a hypochlorite solution into the pipeline as described in Article 3.5.

6. Measure and record the chlorine residual.

7. Allow a minimum 24-hour period to ensure adequate retention of the highly chlorinated water within the pipeline. Measure the chlorine residual at the end of the 24 hours. If the chlorine residual is greater than, or equal to, 40 percent of the value recorded in Step 6, pipeline flushing may commence. If the chlorine residual is less than 40 percent of the value recorded in Step 6, introduce additional chlorine to raise the pipeline to a concentration of 25 mg/L and begin a new 24-hour retention period.

8. Flush the highly chlorinated water from the pipeline to an approved disposal location. Flushing shall continue until the chlorine residual present in the pipeline is equal to that present in the DISTRICT's system under normal operations. Measure and record the chlorine residual.

9. Wait 24 hours. Take a chlorine residual sample and compare to the previous sample taken 24-hours prior. If the chlorine residual has not dropped significantly, the DISTRICT will take a water sample for bacteriological testing. Such samples may be taken from 8:00 AM to 2:00 PM on Monday through Thursday only. The sample will be delivered by the DISTRICT to the local testing laboratory. If the chlorine level has dropped significantly, the CONTRACTOR shall repeat Steps 8 & 9 until there is not a significant drop in the chlorine level.

10. Perform any remaining connections to the existing system.

3.3 PRESSURE TESTING, FLUSHING AND DISINFECTION PROCEDURE – TABLET METHOD

A. The following procedure shall be used for pressure testing and disinfection using the Tablet Method:

1. The CONTRACTOR shall submit and obtain approval of the written ***Testing and Disinfection Plan*** described.

2. Perform and complete hydrostatic testing of the pipeline as described in Article 3.4.

3. After successful completion of the hydrostatic pressure test, measure and record the chlorine residual. If the chlorine residual is greater than 25 mg/L, the 24-hour retention period may commence. If the chlorine residual is less than 25 mg/L, the CONTRACTOR shall introduce additional chlorine in the form of hypochlorite solution to raise the chlorine residual above 25 mg/L.

4. Allow a minimum 24-hour period to ensure adequate retention of the highly chlorinated water within the pipeline. Measure the chlorine residual at the end of the 24 hours. If the chlorine residual is greater than, or equal to, 40 percent of the value recorded in Step 3, pipeline flushing may commence. If the chlorine residual is less than 40 percent of the value recorded in Step 3, introduce additional chlorine to raise the pipeline to a concentration of 25 mg/L and begin a new 24-hour retention period.

5. Flush the highly chlorinated water from the pipeline to an approved disposal location. Flushing shall continue until the chlorine residual present in the pipeline is equal to that present in the DISTRICT's system under normal operations. Measure and record the chlorine residual.

6. Wait 24 hours. Take a chlorine residual sample and compare to the previous sample taken 24-hours prior. If the chlorine residual has not dropped significantly, the DISTRICT will take a water sample for bacteriological testing. Such samples may be taken from 8:00 AM to 2:00 PM on Monday through Thursday only. The sample will be delivered by the DISTRICT to the local testing laboratory. If the chlorine level has dropped significantly, the CONTRACTOR shall repeat Steps 5 & 6 until there is not a significant drop in the chlorine level.

7. Connect the new pipeline to the existing system at one location.

8. Flush the new pipelines at a velocity of at least 5 fps to remove any foreign matter or debris that may have accumulated during construction.

9. Perform any remaining connections to the existing system.

3.4 HYDROSTATIC TESTING OF PIPELINES

A. The CONTRACTOR shall test the entire pipeline as a single unit. The test shall be made by placing temporary bulkheads or blind flanges in the pipe and filling the line slowly with water. The CONTRACTOR shall be responsible for ascertaining that all test bulkheads or blind flanges are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, the adjacent pipe. The CONTRACTOR shall provide sufficient temporary air tappings in the pipelines to allow for evacuation of all entrapped air in each pipe segment to be tested. After completion of the tests, such taps shall be permanently plugged. Care shall be taken to see that all air vents are open during filling.

B. The pipeline shall be filled at a rate that will not cause any surges or exceed the rate at which the air can be released through the air valves at a reasonable velocity and all the air within the pipeline shall be properly purged. During this period, bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the DISTRICT shall be taken.

C. The hydrostatic test shall consist of holding the test pressure on the pipeline for a minimum period of 2 hours. The test pressure shall be as determined by the DISTRICT and shall be a minimum of 200 psi, measured at the highest point of the pipeline section being tested. All visible leaks shall be repaired in a manner acceptable to the DISTRICT.

D. The maximum allowable leakage for distribution and transmission pipelines shall be according to the following formula:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

where:
L = Allowable leakage (gallons per hour)
S = length (feet), the lesser of the actual length being tested or the maximum length for determining leakage. Maximum length for determining leakage is 2000 feet.
D = nominal pipe diameter (inches)
P = test pressure (psi)

E. Pipelines that fail to pass the prescribed leakage test will be considered defective Work, and the CONTRACTOR shall determine the cause of the leakage, shall take corrective measures necessary to repair the leaks, and shall retest the pipelines at no additional cost to the DISTRICT.

F. In the event that it is necessary to depressurize the pipeline in order to repair a leak, any disinfection procedures performed to that point shall be considered compromised. Therefore, if the CONTRACTOR was proceeding with disinfection using the Tablet Method it will be necessary to chlorinate the pipeline after pressure testing using the continuous feed method since the highly chlorinated water would have been lost when the pipeline was depressurized.

3.5 DISINFECTING PIPELINES

A. **Tablet Method:** Calcium hypochlorite tablets or granules shall be placed in the water main as it is being installed. The main shall then be filled with clean potable water. Calcium hypochlorite shall be placed in each section of pipe installed. The amount of calcium hypochlorite shall comply with Tables 1 and 2 of AWWA C651. The pipeline shall be filled at a rate of one foot per second or less to ensure that tablets are not washed down the pipe as it is filled. Care shall be taken to prevent the strong chlorine solution in the pipeline being disinfected from flowing back into the line supplying the water.

B. **Continuous Feed Method:** A chlorine-water solution shall be uniformly introduced into the pipeline by means of a solution-feed chlorinating device. The chlorine solution shall be introduced at one end of the pipeline through a tap in such a manner that as the pipeline is filled with water, the concentration in the water entering the pipe is at least 25 mg/L. Appropriate backflow devices shall be used to prevent the strong chlorine solution in the pipeline being disinfected from flowing back into the line supplying the water.

C. **Valve Operation:** During the process of chlorinating the pipelines, all line valves and other appurtenances shall be operated while the pipeline is filled with the heavily chlorinated water.

D. **Disposal of Water:** Discharge and/disposal of water shall be as described in Section 01560 – Temporary Environmental Controls.

3.6 CONNECTIONS TO EXISTING SYSTEM

A. Where connections are to be made to an existing potable water system, the interior surfaces of all pipe and fittings used in making the connections shall be swabbed or sprayed with a one percent hypochlorite solution before they are installed. Thorough flushing shall be started as soon as the connection is completed and shall be continued until discolored water is eliminated.

3.7 WATER SOURCES

A. As noted above, the written ***Testing and Disinfection Plan*** shall identify the planned water sources to be used for pressure testing and disinfection procedures. The CONTRACTOR is hereby notified that the use of non-potable water trucks as water sources is strongly discouraged. The CONTRACTOR is responsible to complete the disinfection procedures to the DISTRICT'S satisfaction. Any irregularities that arise

during the course of pressure testing and disinfection procedures shall provide sufficient cause for the DISTRICT to require corrective measures and/or additional testing.

* * END OF SECTION * *

SECTION 02900
SITE REVEGETATION

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall perform site revegetation and appurtenant work, complete and in place, in accordance with the Contract Documents.

PART 2 – PRODUCTS

2.1 GENERAL

A. All landscaping materials for soil conditioning, weed abatement, or planting shall be first-grade, commercial quality and shall have certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or furnished with each delivery.

2.2 FERTILIZER

A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.

B. Fertilizer shall be ammonium sulfate with percentages of nitrogen, phosphoric acid, and potash at 16-20-0. Fertilizers shall be uniform in composition, dry, and free flowing.

2.3 SEED MIXTURES

A. Seed shall be mixed by the Supplier. Seed shall be fresh, clean, new-crop seed, composed of the following varieties mixed in the proportions by weight. Seed that has become wet, moldy, or otherwise damaged prior to use will not be accepted.

B. For south and west facing areas, purity and germination percentage shall be as given below:

Species Names	Percent Purity (minimum)	Percent Germination (minimum)	Pounds per Acre (slope measurement)
Zorro Fescue	90	85	2
Berber or Palestine Orchard Grass	90	85	8
Luna Pubescent Wheat Grass	90	85	8
Durar Hard Fescue	90	85	4
Rose Clover	90	85	4
Lutana Cicer Milkvetch	90	85	6

C. For north and east facing areas, purity and germination percentage shall be as given below:

Species Names	Percent Purity (minimum)	Percent Germination (minimum)	Pounds per Acre (slope measurement)
Zorro Fescue	90	85	2
Potomac Orchard Grass	90	85	8
Luna Pubescent Wheat Grass	90	85	8
Durar Hard Fescue	90	85	4
Lutana Cicer Milkvetch	90	85	8

D. All legumes shall be inoculated with the appropriate inoculant within 90 days prior to seeding.

PART 3 – EXECUTION

3.1 GENERAL

A. The landscape work shall not be performed at any time when it may be subject to damage by climatic conditions.

B. Fertilizers, additives, seed, peat, etc. subject to moisture damage shall be kept dry in a weatherproof storage place.

3.2 SEEDING

A. The soil shall be prepared before seeding. The CONTRACTOR shall prepare only enough ground that can be planted within 24 hours thereafter.

B. Seeding shall not be done when wind velocity exceeds 10 mph or within 24 hours after rain.

C. Seeding shall be done in accordance with the following procedure:

1) Seed shall be spread uniformly at the rates specified above.

2) Fertilizer shall be applied at a rate of 300 pounds per acre.

3) The area to be revegetated shall be covered with a fine layer of soil to a depth not greater than 1/4-inch.

4) Finally, all seeded areas shall be covered with a layer of clean, dry, pine needles at a rate of 0.1 pounds per square foot.

* * END OF SECTION * *

Division 3 – Concrete

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor necessary to complete Concrete Reinforcement as indicated, specified herein, or both. The Work of this Section includes but is not necessarily limited to the following:

1. Fabrication and placement of reinforcing steel.

2. Ties, chairs, and other accessories.

3. Shop Drawings.

4. Quality Control.

1.2 WORK EXCLUDED

A. The Work of this Section excludes the following:

1. Reinforcing Steel as required for Unit Masonry specified in Section 042000.

1.3 RELATED WORK

A. The Work of this Section shall be closely coordinated with that of:

1. Section 02315 – Structural Excavation and Fill

2. Section 03300 – Cast-in-Place Concrete Forming

3. Section 03310 – Structural Concrete

4. Section 04200 – Concrete Unit Masonry

5. Division 15 – Mechanical

6. Division 16 – Electrical

1.4 REFERENCED STANDARDS

A. ACI 315 - American Concrete Institute - Details and Detailing of Concrete Reinforcement.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

C. CRSI Placing Reinforcing Bars Recommended Practices.

D. CRSI Manual of Standard Practice.

E. ASTM A 185 - Welded Steel Wire Fabric for Concrete Reinforcement.

F. ASTM A 615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

G. ASTM A 706 - Low Alloy Steel Deformed Bars for Concrete Reinforcement.

H. AWS D1.4 - Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction.

1.5 QUALITY ASSURANCE

A. Perform concrete reinforcing work in accordance with “CRSI Manual of Standard Practice” and “CRSI Placing Reinforcing Bars Recommended Practices”, unless specified otherwise in this Specification.

B. Reinforcing shall be checked and approved by an ICC Certified Inspector prior to placing concrete.

C. The CONTRACTOR shall establish and execute all Quality Assurance/Quality Control (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

1.6 SUBMITTALS

A. Submit shop drawings in accordance with Section 01300 – Contractor Submittals.

B. Indicate grade, bar sizes, spacings, locations, and quantities of reinforcing steel, bending and cutting schedules, and supporting and spacing devices.

C. Shop drawings of all reinforcing steel shall be submitted for approval by the DISTRICT prior to fabrication.

PART 2 – PRODUCTS

2.1 REINFORCING

A. New billet stock deformed bars conforming to ASTM A 615, Grade 60 and Grade 40. Grade 40 bars are to be used only where bars are shown to be bent in the field.

B. Reinforcing bars shown to be welded, shall be deformed bars conforming to ASTM A 706, Grade 60.

C. Epoxy Anchors: Drawings refer to products manufactured by Simpson Strong-Tie Anchor Systems, SET-3G (Epoxy-Adhesive), or equal products are acceptable.

1. Adhesive shall be a two component 100% solids epoxy based system.

2. Adhesive shall meet the minimum requirements of ASTM C-881 Specification for Type I and IV, Grade 3, Class C.

3. Install adhesive and anchors in strict accordance with manufacturer’s recommendations. Special Inspections are required for all epoxy anchor installations.

2.2 TIE WIRE

A. Annealed wire not lighter than 16 gauge.

2.3 ACCESSORIES

A. Accessories: Spacers, chairs, and devices necessary for properly placing, spacing, supporting, and fastening reinforcement in place shall conform to Chapter 3 of the “CRSI Manual of Standard Practice.”

B. Chairs in areas of exposed concrete shall be non-corrosive and have a Class II Type B or Class I protection. All bar support shall have a minimum Class II - Type A Protection.

C. Precast concrete cubes with tie wires shall be used to support reinforcing in footings and slabs on grade.

PART 3 – EXECUTION

3.1 FABRICATION

A. Fabricate reinforcing to size and length indicated, and accurately bend or form to the shape indicated by methods that will not injure the materials. Heating of reinforcement for bending will not be allowed.

B. Bars with kinks or bends not scheduled will be rejected.

3.2 PRODUCT HANDLING

A. Bundle reinforcement and tag with suitable identification to facilitate sorting, placing, transport to, and store at the site so as not to damage the material.

B. Do not store reinforcing on the ground - elevate with blocks or other devices. Reinforcing which is contaminated with dirt or other debris, shall not be placed in the Work.

3.3 CLEANING

A. Before placing reinforcement, and again before concrete is placed, clean reinforcement of loose mill scale, oil, dirt, or other coating that might destroy or reduce the bond.

3.4 PLACEMENT

A. Accurately place reinforcement and securely tie in precise position, using at least 16 gauge annealed steel wire at points where bars cross, and so as to hold them against displacement during the placing of concrete.

3.5 SPACING

A. Exercise particular care in the placing and securing of reinforcement to maintain the proper distance and clearance between parallel bars and between bars and the

forms. Provide metal chairs and spacers to hold steel in position as necessary. Precast concrete cubes with tie wires shall be used to support reinforcing steel in footings and slabs placed on the earth.

B. Supporting items shall be sufficiently distributed to secure reinforcing in the proper position during concrete placement operations.

C. During the placing of concrete, assign a competent person to inspect reinforcement and maintain the bars in their proper positions.

3.6 SPLICING

A. Do not make splices at points of maximum stress except where indicated on the Drawings. At lapped splices, bars shall be in contact and shall be firmly wired together at two locations. Stagger all splices.

B. Dowels required to receive and engage subsequent work shall extend a sufficient length to develop the strength of the bar. Place dowel bars in the forms and secure against displacement during the placing of concrete.

C. Thoroughly clean dowels, extending through construction joints of adhering particles of concrete, before continuing the placing of any subsequent concrete or masonry.

3.7 CLEARANCES

A. Clear distance between reinforcing steel and face of concrete shall be a minimum of:

1. Concrete in contact with earth - 3 inches.

2. Concrete in contact with earth, but placed in forms - 1-1/2 inches for # 5 and smaller bars, and 2 inches for all other.

3. Interior slabs-on-grade - Mat shall be 1-1/2 inches clear of top of slab.

4. Formed surfaces not exposed to ground or weather - 3/4 inches.

3.8 INSPECTIONS

A. Before any concrete may be placed on any portion of the building, the reinforcing steel shall be checked and approved by an ICC Certified Inspector and the District. Any errors or discrepancies shall be corrected before concrete is placed. Such check and approval shall not relieve the CONTRACTOR from responsibility for compliance with the Contract requirements.

3.9 INSPECTIONS

A. During the placing of concrete, the CONTRACTOR shall assign a competent person to maintain the bars in their proper position.

B. During the placing of concrete with welded wire fabric reinforcement, the CONTRACTOR shall assign a competent person to hook and lift up the fabric to its proper position between continuous supports.

3.10 CLEANING UP

A. During the progress of the Work, the premises shall be kept free from debris and waste material resulting from the Work of this Section. Upon completion, all surplus material and debris shall be removed from the site.

* * END OF SECTION * *

SECTION 03300
CAST IN PLACE CONCRETE FORMING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. This Section of Work shall include all labor, materials, appliances, equipment, and accessories necessary to prepare forms to receive all concrete for the building structure as specified in Specification Section 03310 - Structural Concrete, and as shown on the Structural Drawings.

B. All inserts, anchors, bolts, pipe sleeves, and other embedded items shown on the Drawings shall be installed under this Section of the Work.

C. All inserts, anchors, bolts, etc., specified in conjunction with other trades shall be furnished and installed by the trade concerned and under the supervision of the General CONTRACTOR.

1.2 RELATED WORK

A. The Work of this Section shall be closely coordinated with that of:

1. Section 02315 – Structural Excavation and Fill
2. Section 03200 – Concrete Reinforcement
3. Section 03310 – Structural Concrete
4. Section 04200 – Concrete Unit Masonry
5. Section 06110 – Wood Framing
6. Division 15 – Mechanical
7. Division 16 – Electrical

1.3 REFERENCED STANDARDS

A. ACI 318 - Building Code Requirements for Reinforced Concrete.

B. ACI 347 - Recommended Practice for Concrete Formwork.

1.4 QUALITY ASSURANCE

A. Construct and erect concrete formwork in accordance with ACI 318, ACI 347, and applicable construction safety regulations for the place of work.

1.5 COOPERATION WITH OTHER TRADES

A. The CONTRACTOR shall coordinate his work with that of other trades to ensure that the Work will be carried out in an orderly fashion. Embedded items such as anchor

bolts, bearing plates, metal frames, inserts, sleeves, chases, boxes, rough bucks and nailing blocks provided by others, shall be set as part of the Work of this Section.

B. Make provisions for all mechanical and electrical work required to be built into formwork.

PART 2 – PRODUCTS

2.1 LUMBER

A. #2 and better Douglas Fir.

2.2 PLYWOOD

A. APA, PLYFORM, Class I or II, BB-Exterior, not less than 5/8 inches thick and graded in compliance with Product Standard PS 1.

B. For exposed finish concrete surfaces, use new plywood or material with a medium density overlay finish.

2.3 FORM TIES

A. Dayton Superior or approved equal. Wire ties will not be permitted. CONTRACTOR may propose other systems of tying forms, but they must be approved by the Architect before use. Use 1 inch breakback cones where exposed.

2.4 FORM OIL

A. Non-staining mineral oil, mineral oil emulsions, microcrystalline wax emulsions and/or resin emulsions as approved for compatibility with paint.

2.5 TAPE

A. Arno #320 or 3M #471, white, two inch wide minimum.

2.6 CORNER FORMS, RECESS AND CHAMFER STRIPS

A. Burke, Greenstreak or Vulco. PVC plastic shapes to produce the profile shown.

PART 3 – EXECUTION

3.1 PREPARATORY PROVISIONS

A. Prior to placing forms, the CONTRACTOR shall be responsible for the examination and acceptance of all conditions affecting the proper installation of his Work, and shall not proceed until all unsatisfactory conditions have been corrected.

B. Prior to placing forms, insure that:

1. Soil Compaction Tests, as required in Section 02315 Structural Excavation and Fill, have been approved.

2. The placement of aggregate base, as required in Section 02315 Structural Excavation and Fill, is complete.

3.2 DESIGN

A. The design and engineering of all formwork shall be the responsibility of the CONTRACTOR. The design shall be in conformance with ACI 347. Thickness, gauges, spacing, etc., shall be determined by the CONTRACTOR to adequately allow for the design pressures of the concrete and the specified dimensional tolerances.

B. The CONTRACTOR shall be responsible for the examination and acceptance of all conditions affecting the proper construction and/or installation of the Work of this Section, and shall not proceed until all unsatisfactory conditions have been corrected. Commencing work shall be construed as acceptance of all conditions by the CONTRACTOR as satisfactory for the construction and/or installation of the Work.

3.3 FORM MATERIAL

A. Forms shall be constructed of the materials best suited for obtaining desired finish of the concrete surfaces. Wood forms on exposed surfaces shall be free from cupping, warpage, or loose knots.

B. Form materials may be re-used, provided they produce finish surfaces equal to those of the original forms. Before re-use, thoroughly clean and recondition in every respect.

3.4 COATING

A. Forms shall be coated prior to placement of reinforcing with an approved form oil. In no instance shall a coating be used that will interfere with the application and/or adhesion of paint or any other material to be applied to the surface of the concrete.

B. Joints between form panels on exposed faces shall be sealed with tape at the time of erection of the forms, as required to prevent the leakage of mortar or loss of fines.

3.5 CONSTRUCTION

A. Erect to lines, shapes, and dimensions, and in precise position to form the lines and designs indicated; suitable for removal without prying against the concrete. Make forms tight, without cracks or holes, and prevent the leakage of mortar or loss of fine particles from the concrete. Knots that have loosened leaving holes, holes that are not used, and cracks that have opened up, shall be covered with sheet metal for unexposed concrete. Construct formwork as follows:

1. Wales and studding shall be of adequate size and strength, braced and spaced to prevent bulging or sagging of forms. Stud spacing shall be compatible with the thickness and grade of form plywood used. Deflections of form materials shall not exceed 1/360.

2. Use rods and cones or other suitable devices to form the concrete to proper thickness. No wood other than built-in bucks or nailing blocks shall be allowed to remain permanently in the forms.

3. Forms, screeds, and templates are required as necessary to hold lines and elevations, and to securely hold reinforcing and embedded items in place.

4. Chamfer all corners with PVC chamfer strips.

3.6 NEAT FORMS - FOUNDATIONS

A. All footings shall be formed unless neat excavations can be provided as follows:

1. Sides of excavations shall be cut vertical, and bottom corners shall be essentially square. Rounded loose corners are not acceptable.

2. Excavation width shall be 4 inches wider than shown on the Drawings (i.e. 2 inches each side of footing).

3. Adequate devices are provided to support reinforcing, and to accurately maintain location of embedded items during concrete placement.

4. Loose soils, which accumulate during placement of reinforcing, must be able to be readily removed prior to concrete placement.

3.7 EMBEDDED ITEMS

A. Bolts, inserts, and other items embedded in the concrete shall be accurately secured so that they shall not be displaced during the placing and compacting of the concrete. Set embedded bolts with templates in accordance with layouts or Shop Drawings of the Manufacturer. Stabbing of bolts is not allowed.

B. Do not embed piping, other than electrical conduit, in concrete. Locate conduit to maintain strength of the structure at a maximum. If necessary, increase the thickness of the concrete so that the outside diameter of the conduit does not exceed 30 percent of the concrete thickness.

C. Do not place conduit in slabs-on-grade. Typically, all conduit shall be embedded in base materials. When conduit must be placed on top of the aggregate base and embedded in the concrete slab on grade, the conduit shall not encroach into slab more than 1 inch at any location. Where more than three (3) conduits run parallel, conduits shall be spaced to provide 3 inches clear between, or conduits shall be embedded in base material.

D. Form openings and chases as indicated or necessary to receive, pass, and clear other work; verify sizes with the Mechanical and other trades before forming. Give close attention to the location of boxes, cans, and sleeves for others.

E. Form reglets, rebates, seats, and pockets as indicated or necessary to receive or engage the work of others. Verify dimensions and details prior to forming.

F. Chamfer or tool all exposed edges.

3.8 CLEANING

A. Just prior to the placement of concrete, all dirt, chips, sawdust, rubbish, and water or ice shall be removed from the forms.

3.9 REMOVAL OF FORMS

A. Do not remove forms or supports until concrete has hardened sufficiently to resist damage from removal operations. Do not pry against concrete during form removal.

1. Formwork for exposed surfaces shall remain in place until the concrete has cured at a temperature above 50 degrees F for a total of 5 days for normal concrete, and 3 days for highearly strength concrete.

2. Do not remove forms from the sides of walls until the concrete has reached a minimum age of 24 hours. Curing of concrete shall not be interrupted after forms have been removed.

3. Do not place backfill material against structure walls until the concrete has reached an age of 14 days or developed a minimum strength of 3,000 psi. CONTRACTOR shall exercise care during placement and compaction of backfill material to prevent over compacting to the point of displacing the wall line.

4. CONTRACTOR shall exercise care to protect the concrete structures from superimposed loading created by construction equipment.

3.10 TOLERANCES

A. The following maximum tolerances shall be allowed for form construction:

1. Footing thickness - + 1/2 inch.

2. Wall and Footing Centerline Location - + 1/4 inch.

3. Conspicuous Lines and Levels - 1/4 inch variation in 20 feet, except visible lines shall appear straight, true, and free from sudden transitions.

4. Deflection of Form Materials - 1/360 times span.

5. Slab Thickness - + 1/2 inch, - 1/4 inch.

6. Embedded Anchor Bolts - + 1/16 inch.

7. All Other - + 1/4 inch in 10 feet and 1/2 inch overall.

3.11 CLEANING UP

A. During the progress of the Work, the premises shall be kept free from debris and waste material resulting from the Work in this Section. Upon completion, all surplus material and debris shall be removed from the site.

* * END OF SECTION * *

SECTION 03310
STRUCTURAL CONCRETE

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor necessary to complete Cast-In-Place Concrete as indicated, specified herein, or both. The Work of this Section includes but is not necessarily limited to the following:

1. Foundations.

2. Miscellaneous pits, trenches, etc.

3. Interior slabs-on-grade.

4. Inserts as indicated on Structural Drawings.

5. Dowels for masonry.

6. Exterior site work shown on Structural Drawings.

7. Grouting of steel plates.

8. Epoxy anchors.

9. Quality control.

B. All flatwork and associated concrete improvements shown on the Drawings.

1.2 WORK EXCLUDED

A. The Work of this Section excludes the following:

1. Anchors, sleeves, inserts, frames, and plates which are furnished under other Sections of the Specifications.

2. Drainage fills and/or base fills.

1.3 RELATED WORK

A. The Work of this Section shall be closely coordinated with that of:

1. Section 02315 – Structural Excavation and Fill

2. Section 03200 – Concrete Reinforcement

3. Section 03300 – Cast-in-Place Concrete Forming

4. Section 04200 – Concrete Unit Masonry

5. Division 15 – Mechanical

6. Division 16 – Electrical

1.4 REFERENCED STANDARDS

A. ASTM C 31 - Practice for Making and Curing Concrete Test Specimens in the Field.

B. ASTM C 33 – Specification for Concrete Aggregates.

C. ASTM C 39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.

D. ASTM C 40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.

E. ASTM C 42 - Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

F. ASTM C 88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.

G. ASTM C 94 - Specification for Ready-Mixed Concrete.

H. ASTM C 131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

I. ASTM C 136 - Test Method for Sieve Analysis of Fine and coarse Aggregates.

J. ASTM C 143 -Test Method for Slump of Hydraulic Cement Concrete.

K. ASTM C 150 - Specification for Portland Cement.

L. ASTM C 157 - Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.

M. ASTM C 172 - Method of Sampling Freshly Mixed Concrete.

N. ASTM C 173 - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

O. ASTM C 231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

P. ASTM C 260 - Specification for Air Entraining Admixtures for Concrete.

Q. ASTM C 289 - Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).

R. ASTM C 330 - Specification for Lightweight Aggregates for Structural Concrete.

S. ASTM C 494 - Specification for Chemical Admixtures for Concrete.

T. ASTM C 595 - Specification for Blended Hydraulic Cements.

U. ASTM C 618 - Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

V. ASTM D 75 - Practice for Sampling Aggregates.

W. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.

X. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.

Y. ACI 301 - Specifications for Structural Concrete.

Z. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

AA. ACI 305R - Guide for Hot Weather Concreting.

BB. ACI 305.1 - Standard Specification for Hot Weather Concreting.

CC. ACI 306R - Guide for Cold Weather Concreting.

DD. ACI 306.1 - Standard Specification for Cold Weather Concreting.

EE. ACI 309R - Guide for Consolidation of Concrete.

FF. ACI 318 - Building Code Requirements for Structural Concrete.

1.5 QUALITY ASSURANCE

A. Perform cast-in-place concrete work in accordance with ACI Standards listed in Paragraph 1.4 above, unless specified otherwise in this Section.

B. Mix designs shall be prepared by a licensed professional engineer in the State of California representing a qualified testing laboratory.

C. Concrete shall be batched only in a plant currently certified by the National Ready Mix Concrete Association.

D. All concrete placement shall be observed by an ICC Certified Inspector.

E. The CONTRACTOR shall establish and execute a Quality Assurance/Quality Control (QA/QC) program for the services which are being procured from the CONTRACTOR. See Section 01400 – Quality Assurance and Quality Control for requirements.

1.6 WEATHER PROTECTION

A. Concrete shall not be placed when the temperature is above 85 degrees F or below 40 degrees F, or if it is likely to go above 85 degrees F or below 40 degrees F, before the concrete has its initial set without special precautions.

B. Cold Weather Concreting: The provisions of "Standard Specification for Cold Weather Concreting" (ACI 306.1) shall be closely followed except as otherwise specified herein.

1. After the first frost or when the mean daily temperature falls below 40 degrees F for more than one (1) day in a row, concrete shall thereafter be placed at a temperature not lower than 55 degrees F and not higher than 70 degrees F, and shall be maintained not lower than 55 degrees F for at least the first five (5) days. During the next 3 days, it shall be protected from freezing.

2. When the mean daily temperature rises above 40 degrees F for more than three (3) successive days, placement and maintenance of concrete for five (5) days at or above the regular minimum temperature may be discontinued.

3. Equipment shall be provided for adequate heating of the concrete materials and protecting the concrete during freezing and near freezing weather.

4. No frozen materials or materials containing ice shall be used.

5. The housing, covering, or other protection in connection with curing shall remain in place at least 24 hours after the artificial heating is discontinued.

6. No salt or other chemicals shall be used under any circumstances.

7. All forms, reinforcing steel, WWR, and subgrade shall be above 40 degrees F prior to concrete placement.

C. Hot Weather Concreting: The provisions of "Standard Specification for Hot Weather Concreting" (ACI 305.1) shall be closely followed, except as otherwise specified herein. ACI 305.1 - Standard Specification for Hot Weather Concreting.

1. Concrete deposited in hot weather shall have a placing temperature not greater than 85 degrees F so that it will not cause difficulty from loss of slump, flash set, or cold joints.
2. The ingredients shall be cooled before mixing if necessary to maintain the temperature below the maximum placing temperature of 85 degrees F.

1.7 QUALITY CONTROL

A. The CONTRACTOR shall retain and pay a qualified testing laboratory to sample, test, and submit test reports and design mixes as required by the following:

1. Mix Design: Test the proposed cement and aggregates and design concrete mixes for each class of concrete required. The testing laboratory shall obtain samples of each type of aggregate and Portland Cement for analysis and preparation of the mix design. The cement and aggregates shall be sampled and tested in accordance with procedures herein specified. The proportions of the material and the water content shall be established by tests made in accordance with ACI 211.1 for hardrock concrete (ACI 211.2 for lightweight concrete) and the applicable requirements of this Specification. The maximum allowable water content and the quantity of aggregate per sack of cement shall be predetermined by the laboratory. Submit a complete package including the mix design, aggregate reports , and strength forapproval by the DISTRICT at least 14 days

prior to the placing of any concrete. No concreteshall be allowed to be placed until the mix designs have been approved. No substitutions shall be allowed in the materials used on the job without additional designs and test reports as specified herein, showing that the quality of the concrete is satisfactory.

a. Shrinkage test reports in accordance with ASTM C 157 as modified by SEAOCC shall be included with mix designs submitted when shrinkage requirements are listed for a class of concrete. Additional tests will be required during construction to verify continued conformance.

2. Cement: Make a test for every 500 barrels or fraction thereof of cement used, in accordance with the requirements of ASTM C 150. Make the tensile strength test for seven (7) days. Tag Portland Cement for identification at the location of sampling. In the event samples are stored at the mill before delivery, maintain a testing laboratory representative at the mill who is competent and reliable to do or supervise the sampling and tagging of cement and to oversee the storing and loading for delivery, in order to establish the identity of the delivered material with respect to the several lots tested. The representative at the mill shall be employed by the testing laboratory, and shall not be in the employ of, or engaged by, the manufacturer or delivering agency. Where vendor submits certified mill certificate indicating compliance, no further testing will be required.

3. Aggregate: Test all aggregate when the concrete mix is established and whenever the character of the pit source for the material changes. A complete set of aggregate tests shall be made at intervals not exceeding 90 days during the duration of this Work. Tests shall include a sieve sampling and testing in accordance with the requirements of ASTM Standard Methods as follows:

a. Sampling: Sample coarse and fine aggregates in accordance with ASTM D 75. Take samples of aggregates at the source of supply or, in the event the source of supply has been approved, from storage bunkers at the ready mixed concrete plant.

b. Sieve Analysis: ASTM C 136 for coarse and fine aggregate.

c. Organic Impurities: ASTM C 40. Fine aggregate shall develop a color not darker than the reference standard color.

d. Soundness: ASTM C 88. The loss resulting therefrom, after 5 cycles using magnesium sulfate, shall not exceed 18 percent for coarse aggregate or 15 percent for fine aggregate.

e. Abrasion of Coarse Concrete Aggregate: ASTM C 131. The loss shall not exceed 10 percent after 100 revolutions, or 50 percent after 500 revolutions.

f. Reactive Materials: ASTM C 289.

B. Mix designs, tests, etc. for Concrete required by this Specification, need not be made specifically for this job, provided that all data submitted is prepared by an independent testing laboratory, is current within the last six (6) months, is clearly identified and correlated, and that in the judgement of the DISTRICT, the test data

correctly describes the materials proposed for use. [Except Mix Designs with all testing will be required for all interior slab on grade concrete and metal deck concrete fill.]

C. Transit Mixed Concrete: Transit mixed concrete shall be used and shall conform to ASTM C 94. Additional water is not to be added at the job, unless specifically approved by the on-site testing laboratory's representative.

1. Concrete shall be placed within 90 minutes after the water is first added.

2. A Weighmaster's certificate shall accompany each load stating the quantity of cement, water, fine aggregate, coarse aggregate, and admixture contained in the load, and the batch time.

D. Records: Make available for inspection at the site, a record showing the date and time of placing concrete in each portion of the structure. Placement shall be recorded daily in ink on the project's record set of drawings.

E. Inspection of Reinforcing Steel and Concrete Placing: Before any concrete may be placed in any member or portion of the building, the reinforcing steel shall be checked and approved by an ICC Certified Inspector.

F. The representative of the DISTRICT’s testing laboratory shall be present during the placing of all concrete, and shall maintain close control over the quality and slump of the concrete.

1.8 QUALITY ASSURANCE

A. Testing Services furnished by the DISTRICT follows:

1. Sample concrete in accordance with ASTM C 172, except when taking initial slump tests.

2. Compression Tests: Make four (4) standard 6” x 12” test cylinders from each day's placing of each class of concrete, and for each 150 cubic yards placed, or fraction thereof. Date cylinders, number, and note the point from which the sample was taken. Indicate the slump.

3. Test Cylinders: Make test cylinders at the job, in accordance with ASTM C 31. At the end of 24 hours after making, store the cylinders under moist curing conditions at approximately 70 degrees F until tested. Test specimens in accordance with ASTM C 39 at the age of 7 and 28 days.

4. Slump: Whenever plasticizer is to be added, initial slump tests are to be taken at the batch plant prior to the addition of plasticizer. Initial slumps are to be reported along with the quantity of plasticizer added. A second slump after the addition of plasticizer is to be reported and shall be taken in accordance with ASTM C 143. Tests in accordance with ASTM C 143 shall also be performed at the same time as the strength test cylinders are made. Slump tests shall also be made at any time the appearance of concrete indicates a change in consistency. Maximum allowable slump prior to addition of plasticizer, shall be 3 inches.

5. Entrained Air Tests: Freshly mixed concrete shall be tested for air content in accordance with ASTM C 231 and reported with compression test reports. Air,

when required, is to be 5% to 7% by volume. Test air content for each exterior flatwork pour and any time the concrete mix is air-entrained.

B. Test results will be reported in writing to the DISTRICT, Ready-Mix Producer, and CONTRACTOR within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

C. Below Strength Concrete: Should the strength of concrete, as indicated by the tests, fall below the required minimum, then additional tests of the concrete which the unsatisfactory samples represent may be required. Make such tests in accordance with ASTM C 42. Fill the holes made by cutting the cores with "dry pack" concrete. Should core tests show that concrete has developed the required strength, the costs of tests shall be paid by the Owner. Should these tests indicate that concrete is below the required strength, the cost shall be an obligation under this Section and defective concrete shall be removed and replaced with concrete of the required strength.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

PART 2 – PRODUCTS

2.1 PORTLAND CEMENT

A. ASTM C 150, Type II, low alkali.

B. The brand of cement shall not be changed during the progress of the job unless approved in writing by the Architect. Cement shall have been used for at least two (2) years with the proposed aggregate without detrimental reaction.

2.2 AGGREGATES

A. Fine and coarse aggregate ASTM C 33, conforming to all tests herein specified at Paragraph 1.07A.3 above.

B. Course aggregate shall:

1. Be furnished from one source,

2. Be crushed stone or gravel,

3. Be washed unless independent testing laboratory can certify that aggregate meets all required tests, and

4. Shall have a maximum of 1% passing the #200 sieve.

C. Fine Aggregate shall:

1. Be furnished from one source,

2. Be clean, sharp, natural sand,

3. Be washed unless independent testing laboratory can certify that aggregate meets all required tests, and

4. Shall have a maximum of 5% passing the #200 sieve.

2.3 WATER

A. Clean and free of deleterious amounts of acids, alkalis, salts, oils, or organic substances conforming to ASTM C 1602.

2.4 ADMIXTURES

A. An air-entraining admixture conforming to ASTM C 260 shall be used in air-entrained concrete. Use BASF Corporation “MasterAir” or equal.

B. A water reducing admixture conforming to ASTM C 494 Type A or F, shall be used in all concrete.

1. For Class"A" and "C" Concrete, use BASF Corporation “MasterPolyheed” series Nonchloride Admixture, or equal.

2. For Class "B" Concrete, use BASF Corporation “MasterPolyheed” series Non-chloride Admixture For Use With Fly Ash, or equal.

C. The use of high-range water-reducing admixtures conforming to ASTM C 494, Type F BASF Corporation MasterRheobuild 1000 or “MasterGlenium” series or equal, is allowed with the DISTRICT's approval.

D. For acceleration of concrete, the use of a non-chloride bearing conforming to ASTM C 494, Type C or E BASF Corporation MasterSet series or equal, is allowed with the DISTRICT’s approval.

E. The CONTRACTOR shall obtain the DISTRICT's approval of all the admixtures he proposed to use before the testing agency proceeds with the design mixes.

F. Calcium chloride shall not be used under any circumstances.

2.5 FIBER REINFORCEMENT

A. Plastic/temperature shrinkage control: BASF Corporation MasterFiber series or equal, for use in slabs on ground and elevated slabs.

2.6 CURING MATERIALS

A. Polyethylene sheet 10-mill minimum thickness.

B. Insulated blankets.

C. BASF Corporation MasterKure CC 200 WB.

D. Euclid Chemical Company Rez-Seal Vox.

E. Euclid Chemical Company Kurez DR Vox.

F. Or Equal products will be considered.

2.7 NON-SHRINK GROUT

A. Grout between concrete and steel-bearing plates shall be BASF Corporation MasterFlow 885 grout, or equal.

2.8 EPOXY

A. Epoxy for anchoring reinforcement at existing building, or for repair/replacement of mislocated dowels, shall be BASF Corporation MasterEmaco ADH 1420, Simpson SET-XP, or equal, placed with approval of the DISTRICT in accordance with the manufacturer's recommendations.

2.9 PATCHING MATERIALS

A. MasterEmaco N 424 as manufactured by BASF Corporation, or equal.

2.10 CONCRETE MIX DESIGNS

A. Design: Select and proportion ingredients using trial batches; sample, cure, and test concrete mix through an approved independent testing laboratory in accordance with ACI 309 per ACI 211.1. Maximum slumps given below are measured prior to addition of water reducing admixtures.

B. Concrete Types: The various concrete mix designs to be used are as follows:

1. Class "A" - For use in all foundations.

a. 3/4 inches maximum aggregate.

b. 28-Day compressive strength - 3,000 psi minimum.

c. Maximum slump - 3 inches.

d. Water/cement ratio - 0.55 maximum.

e. Water reducing admixture required.

2. Class "B" - For use in all interior slabs-on-grade.

a. 3/4 inches aggregate.

b. 28-Day compressive strength - 4,000 psi minimum.

c. Maximum slump - 3 inches.

d. Water/cement ratio - 0.45 maximum.

e. Shrinkage - 0.055 maximum.

f. Water reducing admixture required.

g. Fiber Reinforcement.

3. Class “C” - For use in all exterior concrete.

a. ¾ inch aggregate.

b. 28-Day compressive strength – 4,500 psi minimum.

c. Maximum slump – 3 inches.

d. Water/cement ratio – 0.45 maximum.

e. 5 – 7% Air entrainment.

f. Water reducing admixture required.

g. Fiber Reinforcement.

2.11 CONCRETE MIXING

A. Measuring, mixing, and transporting concrete shall be in accordance with ACI 304R.

B. Truck mixers:

1. Limit volume of concrete in truck to 63% of total capacity per ASTM C 94.

2. Mix a minimum of 70 revolutions at the rate of rotation designated by the manufacturer.

3. Truck shall be equipped with revolution counter that is a re-settable recording type. Do not start counter until all ingredients are in drum.

4. Super plasticizers are to be added at the site. Mix not less than the minimum revolutions recommended by the admixture manufacturer.

C. Do not add water at the site, unless specifically approved by the testing laboratory's representative. If water is added, amount shall be recorded on the batch ticket. At no time will water be added such that the maximum water/cement ratio is exceeded.

D. Do not use concrete that has stood over 20 minutes after leaving the mixer, or concrete that is not placed in less than 90 minutes after water is first introduced into the mix, unless previously approved by the DISTRICT.

E. The mixers and handling devices shall be thoroughly cleaned after every pour.

PART 3 – EXECUTION

3.1 PREPARATORY PROVISIONS

A. Prior to placement of concrete, the CONTRACTOR shall be responsible for the examination and acceptance of all conditions affecting the proper placement of the concrete, and shall not proceed until all unsatisfactory conditions have been corrected.

B. Prior to placing concrete, insure that:

1. Soil compaction tests as required in Section 02315 – Structure Excavation and Fill, have been approved.

2. The placement of aggregate base as required in Section 02315 – Structure Excavation and Fill, is complete.

3. Formwork as required in Section 03300 – Cast-In-Place Concrete Forming, is approved by the DISTRICT.

4. Reinforcement as required in Section 03200 - Concrete Reinforcement, is approved by the ICC Certified Inspector and the DISTRICT.

5. All embedded items are installed and securely held in place.

6. Mix designs are approved by the DISTRICT.

3.2 CLEANING AND WETTING FORMS

A. Remove foreign matter accumulated in forms, and rigidly close ports and openings left in the formwork immediately prior to starting concrete placement.

B. Wet wood forms sufficiently to tighten up cracks. Wet other materials including soils, sufficiently to reduce suction and maintain the workability of the concrete mix. Standing water in the forms or on the subgrade is not allowed. See Paragraph 3.5-D.2 below for wetting of subgrade for slabs-on-grade. Do not wet forms and soil during freezing weather.

C. Thoroughly clean tools used in transporting, placing, and consolidating the concrete immediately after each use.

3.3 EMBEDDED ITEMS

A. Place foundation bolts and other items to be built in prior to placing concrete. Accurately position and rigidly support using templates. Stabbing of bolts will not be acceptable.

B. Place PVC chamfer strips as required in Section 03300 – Cast-In-Place Forming.

3.4 JOINTS

A. Form joints in the concrete work according to details and where indicated on the Drawings. Place concrete in a monolithic pour between joints.

B. Construction Joints: Construction joints for slabs-on-grade shall be located as shown on the Drawings. Construction joints for all other structural concrete work shall be

located and constructed to least impair the strength of the structure. Joints shall be perpendicular to the main reinforcing. Locations and details shall be approved by the DISTRICT. Reinforcing steel shall be continuous across construction joints unless otherwise indicated. Provide keys in form as directed by DISTRICT. Roughen and thoroughly clean the surface of the concrete; remove all laitance; and wet the surface before placing new concrete against the joint.

C. Joints for Slabs-on-Grade:

1. Provide dowelled joints spaced as shown on the Drawings.

2. Sawed joints cut with a "soft saw" the same day the slab is placed, are preferable. In lieu of sawed joints, see Paragraph 3.6-B.4 below.

3. Depth of joint shall be the greater of 1-1/2 inches or one fourth the thickness of the slab. No exceptions.

4. Slabs shall be placed in the largest practical size with a minimum length and/or number of construction joints.

5. Construction joints shall occur at a typical dowelled joint.

3.5 PLACING CONCRETE

A. General: Place concrete in conformance with the requirements of ACI 304 & ACI 318.

B. Conveying:

1. Direct discharge from the truck into the forms, or pumping, is the preferred method of placement.

2. Handle concrete from the mixer to the location of placing as rapidly as practicable, avoiding separation or loss of ingredients, and re-handling.

3. Equipment for chuting, pumping, or other conveying method shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.

C. Placing:

1. Place concrete in lifts not over 2'-0" deep. Place and consolidate successive layer prior to initial set to prevent cold joints.

2. Keep surface of concrete level throughout with a minimum of concrete allowed to flow from one position to another.

3. Carry on placing of concrete as a continuous operation until the placing of each section or panel is completed.

4. Thoroughly consolidate concrete and work it around reinforcement and embedded fixtures, and into corners and angles of forms by internal vibrators,

consolidate to exclude rock pockets, air bubbles, and honeycombs, and to obtain the required density and strength.

5. Exercise care to avoid over-vibration and separation of ingredients. Use vibrators to consolidate each layer and extend vibrator into previously placed layer. Use vibrator to bring fine material to the faces and top surfaces to produce the proper finish. Assign at least one workman at each location where concrete is being placed to vibrate and consolidate the concrete in forms. Vibrators shall not be left in any one spot longer than 30 seconds and shall be kept constantly in motion. Keep extra standby vibrators at the site.

6. Do not place concrete under water.

D. Slabs On Grade:

1. Prior to placing concrete, accurately locate center of dowelled joints for sawing or tooling.

2. Moisten aggregate base slightly to prevent suction. Base shall be just damp, not wet, and standing water is prohibited.

3. Place concrete with pumps or other suitable method. Concrete trucks are not allowed within the formed area to receive concrete.

4. Place concrete to the specified thickness and consolidate with internal vibrators. Vibrating screeds may be used if it can be demonstrated that the concrete can be fully consolidated.

5. Screed level to exact elevation.

3.6 FINISHING

A. Top of Footings: Rough wood float finish. Elevation and grade at top of footing shall be maintained within a tolerance of + 1/4 inch.

B. Slabs-on-Grade:

1. All slabs-on-grade shall have a monolithic placement. Screed concrete to accurate level grades and float to a uniform level surface.

2. Steel trowel with self propelled troweling machines to a smooth, dense, hard finish. Do not burnish trowel or over-trowel surfaces with hardener. Surface shall be free from depressions, trowel marks, scale, and foreign deposits.

3. Delay final troweling until after sheen has completely disappeared. Dusting will not be permitted under any circumstances.

4. Tooled joints and edges shall be cut immediately after initial floating is completed and shall be re-cut after concrete has taken its initial set. Minimum depth of joint is 1-1/2 inches.

5. Saw cut joints shall be cut with a "soft saw" the same day the concrete is placed. Minimum depth of joint is 1-1/2 inches.

6. Finish floors shall contact a 10 foot straight edge placed in any location, except across flow lines, within a tolerance of plus or minus 1/8 inch.

7. Depress slabs where shown on Drawings.

C. Exposed Poured-In-Place Concrete Surfaces:

1. Immediately after forms are removed, exposed surfaces shall be finished and "sacked".

2. Remove all snap-ties or other devices to 1 inch below surface and dry pack holes with patching material that matches concrete. Grind off any ridges, projections, or other deformities. Sack surface to a smooth uniform finish.

3. Moist-cure sacked surfaces for not less than three (3) days.

D. Un-exposed Poured-In-Place Concrete Surfaces:

1. Remove all snap-ties or other devices to 1 inch below surface of concrete.

2. Patch any large holes, small rock pockets or defects, and fill snap-tie cone holes flush.

3.7 CURING

A. General:

1. Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures, and shall be maintained with minimal moisture loss at a relatively constant temperature above 50 degrees F for a total of five (5) days.

2. Protect concrete from excessive changes in temperature during the curing period and at the termination of the curing process. Changes in the temperature of the concrete shall be as uniform as possible and shall not exceed 5 degrees F in any one hour or 50 degrees F in any 24 hour period. There will not be greater than 35 degree F difference between the concrete surface and core.

3. Protect concrete from injury from the elements until full strength is developed. Protect from mechanical injury.

B. Formed Surfaces:

1. Formed surfaces shall be cured by leaving forms in place for a minimum of five (5) days.

2. At CONTRACTOR's option, forms may be removed in less than five (5) days, if formed surfaces are cured with one coat of Euclid Chemical Company Rez Seal or equal, applied at not less than the manufacturer's recommended coverage.

C. Interior Floor Slabs – Slab-on-Grade:

1. Apply one coat of Euclid Chemical Company Rez Seal Vox or equal, as soon as possible after finishing. Apply at a rate of 350 to 400 sf/gallon. Apply a second coat within 24 hours after finishing.

2. In lieu of the second coat requirements of Item 1 above, after the first coat has dried, lightly wet the surface with a fog spray to provide a thin film of standing water. Cover with polyethylene, or blanket, and seal all edges to prevent evaporation of moisture. Maintain free water on the surface of the concrete for not less than seven (7) days.

3.8 REPAIR OF SURFACE DEFECTS

A. Defective Work:

1. Any concrete work not formed as indicated or not true to the intended alignment; or not plumb or level where so intended; or not true to the intended grades and levels; or that has voids or rock pockets; or that may have sawdust, wood, or debris embedded in it; or does not fully conform to the Specifications; will be deemed to be defective.

2. Concrete finish which is not true to line and plane; or which is not thoroughly troweled and properly surfaced as specified; or which varies more than 1/4 inch from the required finish grade; or which has any roughened top surfaces; or which does not connect properly to the adjoining work; will be deemed to be defective.

B. Defective work shall be removed and replaced with materials complying with the Specifications.

3.9 GROUTING STEEL BASE PLATES

A. Grouting Steel Base Plates: Fill space between concrete and steel base plates or bearing plates with non-shrink grout. Mix and install grout in accordance with manufacturer's recommendations for either dry pack or flowable grout.

3.10 CLEANING UP

A. Upon completion of the Work, remove excess materials, equipment, apparatus, tools, and the like and leave the premises clean, neat, and orderly.

* * END OF SECTION * *

Division 4 - Masonry

SECTION 04200
CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.1 WORK INCLUDED

A. This Section of the Work shall include, but is not necessarily limited to the following: all plant, labor, materials, equipment, quality control and services required for manufacturing, transporting, and placing all masonry work including reinforcing, mortar, and grout as shown on the Drawings and as specified herein.

1.2 WORK EXCLUDED

A. The Work of this Section excludes the following:

1. Concrete work.

1.3 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

A. Bolts, anchors, and inserts for connection of structural or architectural components.

B. Inserts or anchors for connection of mechanical or electrical items.

1.4 RELATED WORK

A. The Work of this Section shall be closely coordinated with:

1. Section 03300 – Cast-in-Place Concrete Forming
2. Section 03200 – Concrete Reinforcement
3. Section 03310 – Structural Concrete
4. Section 05510 – Structural Metal Framing
5. Section 06110 – Wood Framing
6. Section 08100 – Hollow Metal Doors and Frames
7. Section 08361 – Overhead Coiling Doors
8. Division 15 – Mechanical
9. Division 16 – Electrical

1.5 REFERENCED STANDARDS

A. The following standard specifications form a part of this Specification as though herein repeated. The ASTM Designations shall be construed to be the latest revision of that particular specification.

1. American Society for Testing Materials Specifications (ASTM):

a. A 615 Specification for Deformed Billet Steel Bars for Concrete Reinforcement

b. C 33 Specification for Concrete Aggregate

c. C 67 Methods of Sampling and Testing Brick and Structural Clay Tile

d. C 90 Specification for Hollow Load-Bearing Concrete Masonry Units

e. C 91 Specification for Masonry Cement

f. C 140 Methods of Sampling and Testing Concrete Masonry Units

g. C 144 Specification for Aggregate for Masonry Mortar

h. C 150 Specification for Portland Cement

i. C 207 Specification for Hydrated Lime for Masonry Purposes

j. C 270 Specification for Mortar for Unit Masonry

k. C 331 Specification for Lightweight Aggregates for Concrete Masonry Units

l. C 404 Specification for Aggregates for Masonry Grout

m. C 426 Test Method for Drying Shrinkage of Concrete Block

n. C 476 Specification for Grout for Masonry

o. C 652 Specification for Hollow Brick (Hollow masonry units made from clay or shale)

p. C 744 Prefaced Concrete and Calcium Silicate Masonry Units

q. C 1019 Method of Sampling and Testing Grout

2. International Building Code: Chapter 21.

1.6 SUBMITTALS

A. Samples: CONTRACTOR shall submit two full size masonry units of each type, including special shapes required, to show range of colors, texture, finishes, and dimensions. Completed work shall match the color and texture of approved samples.

B. Mix Designs: The CONTRACTOR, at his expense, shall furnish the DISTRICT with mix designs prepared by an approved Testing Laboratory for mortar and grout. The mix designs shall be submitted at least two weeks prior to commencement of masonry work and substantiated with current aggregate tests and test results (within the last six

months) showing that the proposed mix will meet the strength requirements of these Specifications.

1. Mortar mix design shall be submitted as a complete package and include the following:

a. Tests on cement showing conformance with ASTM C 150 for Type II or Type III Portland Cement or ASTM C 91 for masonry cement;

b. Tests on hydrated lime showing conformance with ASTM C 207 Type "S";

c. Aggregate tests showing conformance with ASTM C 144 including grading, composition and soundness;

d. Mix design in accordance with ASTM C 270 Property Specifications;

e. Mortar test reports per ASTM C 270.

2. Incomplete submittals will be cause for rejection. Only complete packages will be reviewed.

3. Grout mix design shall be submitted as a complete package and include the following:

a. Tests on cement showing conformance with ASTM C 150 Type II or Type III Portland Cement;

b. Tests on coarse aggregate showing conformance with ASTM C 404, including grading deleterious substances, organic impurities, and soundness;

c. Tests on fine aggregate showing conformance with ASTM C 144, including grading, composition and soundness, or ASTM C 33 (fine aggregate) including grading, deleterious substances, and soundness;

d. Mix design in accordance with ASTM C 476;

e. Compressive test reports in accordance with ASTM C 1019.

4. Incomplete submittals will be cause for rejection. Only complete packages will be reviewed.

C. All submitted data shall be clearly identified and correlated. Approved mix designs shall be used as long as aggregate characteristics remain unchanged. Upon significant changes in aggregate, prepare new mix designs.

D. Certificates for Masonry Units:

1. The CONTRACTOR shall furnish the DISTRICT with a certificate stating that concrete masonry units have been properly and thoroughly cured at the plant before shipment, and that the units conform to the requirements of this

specification. The certificate shall state the date of manufacture, compressive strength, maximum moisture content, absorption, and shrinkage. The samples shall be taken from the on-site stockpiles or stockpiles clearly identified for shipment to the site. The certificate shall also contain the name and address of the project, and the General CONTRACTOR, and the quantity and date or dates of shipment or delivery to which certificates apply.

E. The CONTRACTOR shall furnish the DISTRICT upon request, with certified copies of production plant testing of cementitious materials showing that they conform to the requirements of these Specifications.

F. Shop Drawings: Submit shop drawings in accordance with Section 01300 – Submittal Procedures, for all masonry reinforcement showing location of bars, splices, hooks, and bar dimensions. Submit shop drawings as single copy electronic PDF copy.

1.7 QUALITY CONTROL

A. Hollow Masonry Units: Sampling and testing prior to and during construction, shall be in accordance with ASTM C 140. Report on compressive strength, moisture content, absorption and shrinkage in accordance with ASTM C 90 for each 5,000 square feet of wall.

B. Grout: Sampling and testing prior to and during construction, shall be in accordance with ASTM C 1019 for each 5,000 square feet of wall of each day's placing of grout.

C. Specified compressive strength of masonry f'_m=1,500 psi, shall be verified in accordance with IBC Section 2105.2.2.1 Unit Strength Method.

D. CONTRACTOR shall pay for all testing prior to construction required for masonry units and design and testing of mortar and grout. DISTRICT shall be responsible for testing all masonry units, mortar, and grout as placed in the structure. However, CONTRACTOR shall pay for all retesting required when original tests indicate non-conformance with the Specifications, unless satisfactory retests are obtained.

1.8 INSPECTION

A. The DISTRICT shall provide a certified inspector for special inspection of all masonry work performed in accordance with TMS 602 Specification for Masonry Structures.

1.9 COOPERATION WITH OTHER TRADES

A. This CONTRACTOR shall coordinate his Work with that of other trades to insure that the Work will be carried out in an orderly fashion. Embedded items such as anchor bolts, bearing plates, metal frames, inserts, sleeves, chases, boxes, and rough bucks provided by others, shall be set as part of the Work of this Section.

B. Mechanical and plumbing penetrations shall be coordinated with the specific trades. Install as work progresses.

1.10 HANDLING AND STORAGE

A. All cementitious materials shall be stored under cover in a dry place.

B. Hollow masonry units immediately upon delivery to the building site, shall be protected from exposure to weather. The CONTRACTOR shall be responsible for providing and maintaining the protection necessary to prevent re-wetting of delivered concrete masonry units prior to their use. Concrete masonry units which fail to meet the moisture content limitation at any time during storage on the job shall be dried and shall not be laid until test proves them to be satisfactory.

1.11 COLD WEATHER CONDITIONS

A. Follow special construction procedures when the air temperature is below 40 degrees F as follows:

1. Protect and/or heat masonry units as required to obtain above 32 degrees F temperature then laid.

2. Use Type III cement to reduce required protection time - at CONTRACTOR's option.

3. Temperatures 40 degrees F to 32 degrees F: Heat mixing water or sand to obtain a mortar temperature between 70 degrees F and 100 degrees F.

4. Temperatures 32 degrees F to 25 degrees F: Heat mixing water and sand to obtain a mortar temperature between 70 degrees F and 100 degrees F.

5. Temperature 25 degrees F to 20 degrees F: Heat mixing water and sand to obtain a mortar temperature between 70 degrees F and 100 degrees F. Provide heat source on both sides of wall to maintain air temperature above 32 degrees F. Provide windbreaks when wind is in excess of 15 mph.

6. Below 20 degrees F: Heat mixing water and sand to obtain a mortar temperature between 70 degrees F and 100 degrees F. Provide enclosure and auxiliary heat to maintain air temperature inside enclosure above 32 degrees F.

B. Protect in-place masonry construction when the average daily temperature is below 40 degrees F as follows:

1. Protection shall be provided for 24 hours after construction when Type III cement is used, and for 48 hours when Type II cement is used.

2. Temperatures 40 degrees F to 32 degrees F: Protect from rain or snow.

3. Temperatures 32 degrees F to 25 degrees F: Cover masonry totally.

4. Temperatures 25 degrees F to 20 degrees F: Cover masonry totally with insulating blankets.

5. Temperatures below 20 degrees F: Cover masonry with insulating blankets, and provide heat source on both sides of masonry construction as required to maintain 32 degrees F minimum temperature.

1.12 HOT WEATHER CONDITIONS

A. Protect completed masonry construction from direct exposure to wind and sun for 36 hours when ambient air temperature in the shade exceeds 90 degrees F.

B. Pre-wetting of hollow clay masonry units may be required to reduce suction and increase bond between masonry and mortar.

PART 2 – PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Hollow load bearing units shall be standard units conforming to ASTM C 90, with net area compressive strength of 1,900 psi (f'_m=1,500 psi).

B. Nominal face dimension shall be 8x8x16 with special units as required for construction or shown on the Drawings.

C. Open-end bond beam units shall be used wherever possible.

D. Units shall be as shown on the Drawings. Color to be approved by DISTRICT prior to
manufacturing.

E. Units shall be made of lightweight aggregate conforming to ASTM C 331, and completed units shall not weigh more than 120 pcf.

F. Moisture content and shrinkage shall conform to ASTM C 90, Table 1, for an average RH of less than 50 percent. Shrinkage shall not exceed 0.055 percent.

G. Units shall be cured for a minimum of 28 days before placement in the structure.

H. Colored units as selected by the DISTRICT, shall be uniform in color.

I. Irregular split-face units will not be accepted. Surface projection or indentation shall be plus or minus 1/2 inch maximum.

2.2 MORTAR

A. Masonry mortar shall conform to property specifications of ASTM C 270, Type "M", or “S”, with a minimum compressive strength of 2,500 psi, or 1800 psi, at 28 days.

B. Aggregate ratio by volume shall be as follows:

AGGREGATE (DAMP AND LOOSE)

Not less than 2-1/4 and not more than 3-1/2 times the sum of the separate volumes of cementitious materials.

C. Cement for mortar shall conform to ASTM C 150, Type II or Type III (for cold weather construction only) or ASTM C 91 for masonry cement. Hydrated lime shall conform to ASTM C 207, Type "S". Aggregates shall conform to ASTM C 144.

D. Mortar color to match masonry units.

E. No admixtures shall be used in mortar without written permission of the DISTRICT.

F. Materials for mortar shall be accurately measured in suitably calibrated devices. Shovel measurements will not be acceptable. One sack (94 pounds) of Portland cement shall be considered as one cubic foot. When aggregate is measured, allowances should be made for bulking.

G. Time Limit In Use of Mortar: Mortars shall be used and placed within 2 hours after mixing. Mortar that has started to set shall not be used.

H. The consistency of mortar shall be adjusted to the satisfaction of the mason, and as much water shall be added as is compatible with convenience in using the mortar. If the mortar begins to stiffen from evaporation or absorption of a part of the mixing water, the mortar shall be retempered by adding water and remixing. Mortar shall not be used after the cement has begun its final set.

2.3 CONCRETE GROUT

A. Concrete grout shown on the Drawings or required by this Section of the Specifications shall develop a compressive strength of not less than 2,000 psi at 28 days. All grout shall contain not less than 6-1/2 sacks of cement per yard, and shall have a slump between 8 and 11 inches when placed. Water/cement ratio shall not exceed 0.8.

B. Grout shall conform to the requirements of ASTM C 476, for "Coarse Grout."

C. Coarse aggregate for grout shall conform to ASTM C 404, Size No. 8 or Size No. 89, and fine aggregate shall conform to ASTM C 144 or C 33.

D. Cement shall conform to ASTM C 150, Type II, or Type III (cold weather construction).

E. Grout shall not be used after cement has begun its final set. In no case shall grout be used more than one hour after the addition of water and initial mixing.

F. Grout shall be designed by an approved testing laboratory in accordance with the ASTM Standards.

G. Plasticizers shall not be added to the grout mix.

2.4 REINFORCEMENT

A. Reinforcing bars shall conform to ASTM A 615, Grade 60. Except, where bars are shown to be field bent, bars shall conform to ASTM A 615, Grade 40.

B. All reinforcing splices shall be lapped 48 diameters, except lap splices at jambs and ends of walls shall be lapped 63 diameters.

C. Hooks and bends shall be provided as shown on the Drawings.

D. Provide mechanical devices for holding reinforcing in place prior to grouting.

PART 3 – EXECUTION

3.1 INSPECTION OF WORK BY OTHERS

A. Inspect foundations, and other concrete surfaces on which masonry is to be laid, to assure they are as follows:

1. Level and true to proper grade.

2. Clean and free of laitance, poorly bonded aggregate or foreign material.

3. Reinforcing dowels are properly placed.

B. For the record, prepare written report endorsed by installer, listing conditions detrimental to performance of unit masonry.

C. Do not begin work until any deficiencies have been corrected.

3.2 PREPARATION

A. Masonry CONTRACTOR shall not start work if surfaces and reinforcing are not in accordance with the above paragraph.

B. Lay only masonry units which have been certified, handled, and stored as required by these Specifications.

C. Observe special construction requirements for hot or cold weather construction.

3.3 WORKMANSHIP

A. All masonry shall be plumb, level, straight, and true to dimensions indicated and executed to produce a high degree of mechanical perfection. Such work shall start where feasible, at the least important corner or wall, and the masonry CONTRACTOR shall request an early inspection of the work by the Architect. All pattern work, bonds, or special details indicated on the Drawings, shall be accurately and uniformly executed.

3.4 ALLOWABLE TOLERANCES

A. Maximum variation from plumb:

1. In line of walls: 1/4 inch between floor and roof.

2. At exterior corners and other conspicuous lines: 1/4 inch in any 20 feet.

3. Maximum variation from level of lintels, sills, horizontal joints, and other conspicuous lines: 1/4 inch in any bay, or 20 feet.

3.5 INSTALLATION

A. Use masonry saws to cut and fit masonry units.

B. Bond: Running bond with vertical joints located at center of masonry units in

alternate course below.

C. Set units plumb, true to line, and with level courses accurately spaced.

D. Adjust masonry unit to final position while mortar is soft and plastic.

E. If units are displaced after mortar has stiffened, remove, clean joints and units of mortar, and relay with fresh mortar.

F. When joining fresh masonry to set or partially set masonry construction, clean exposed surface of set masonry and remove loose mortar prior to laying fresh masonry.

3.6 PROTECTION OF WORK

A. Brace walls as necessary during construction.

B. Protect sills, ledges, and off-sets from mortar drippings, or other damage during construction.

C. Remove misplaced mortar or grout immediately.

D. Protect face materials against staining.

E. Protect door jambs and corners from damage during construction.

F. Cover tops of masonry walls exposed to the weather with non-staining waterproof covering when work is not in progress. Covering shall over hang at least two feet on each side of the wall, and be sufficiently weighted down to stay in place under high winds.

3.7 MORTAR BEDS

A. Lay with full mortar coverage on horizontal and vertical face shells. Webs may be left without mortar, except as noted below.

B. Provide full mortar coverage on horizontal and vertical face shells and webs on starting course on footings, except the area where grout occurs shall be free from mortar so that the grout will contact the foundation.

C. Remove any excess mortar protruding more than 1/2 inch into cells, and as required, to maintain un-obstructed vertical cells. Do not allow mortar to fall into cells to be grouted.

3.8 JOINTS – STANDARD UNITS

A. Use 3/8 inch nominal joints at CMU.

B. Construct uniform joints.

C. Shove vertical joints tight and insure that face shell has full mortar coverage.

D. Tool all joints concave to produce a dense finish, well bonded to the block at edges, including unexposed joints.

E. Joints shall present a smooth joint free from ridges projecting beyond the face of the unit.

F. Horizontal joints above and below glazed units shall be constructed per this Paragraph.

G. After jointing, brush surface to remove all loose mortar droppings and ridges left by jointing tool.

3.9 BUILT-IN WORK

A. Avoid cutting and patching.

B. Install bolts, anchors, inserts, frames, flashings, conduit, and other built-in items as masonry work progresses.

C. Provide over-sized hole around bolts and fill with grout or mortar, as shown on Drawings.

D. Solidly grout spaces around built-in items.

E. See Drawings for special instructions regarding embedded plate installation.

3.10 REINFORCEMENT

A. Reinforcement shall be spaced and positioned as shown on the Drawings. Bars shall be firmly held in place at ends and at intervals not exceeding 96 diameters by means of ties, frames, chairs, or other suitable devices.

B. Horizontal reinforcement shall be placed in bond beam units. Bars shall be of the longest practical length. Stagger splice locations six feet, and lap 48 diameters. Wire tie lap splices at two places. Hook ends at corners and wall intersections as shown on the Drawings. Wire tie to verticals where they cross.

C. Vertical reinforcement shall be placed in open-end unit cells where possible.

D. Vertical reinforcement is full height typically, and shall be spliced only where detailed on the Drawings. Lap splices 48 diameters, except lap splices at jambs and ends of walls shall be lap 63 diameters. Wire tie lap splices at two places.

3.11 GROUT

A. All walls shall be grouted solid.

B. Assure that cores and reinforcing are clean of mortar projections, mortar drippings and other deleterious material.

C. Allow mortar to cure 24 hours minimum before grouting walls.

D. Place grout in 5’-4” foot maximum vertical pours (low lift grouting).

E. Stop grout pours 1-1/2 inch below the top of masonry to form a mechanical key for the next grout pour. Do not stop grout lift at a bond beam, embedded anchor bolt, or strap.

F. Vibrate all grout into place using a mechanical vibrator. No exceptions.

G. Reconsolidate grout as necessary by vibration if block absorption is high, or if any subsidence is observed.

3.12 CURING

A. Finished block masonry shall not be wetted except when exposed to extreme hot weather or hot wind. Wet only by using a nozzle regulated fog spray sufficient to just dampen the face, but not of such quantity to cause any water to flow down over the masonry.

3.13 POINTING AND CLEANING

A. At final completion of unit masonry work, fill all holes in joints and tool.

B. Cut-out and re-point defective joints.

C. Dry brush masonry surface after mortar has set, at end of each day's work, and after final pointing. Use a stiff fiber brush and where mortar adheres to masonry units, remove mortar with a non-metallic chisel or scraper after it has dried and hardened. Remove the remaining mortar with dry brushing. After dry brush cleaning, thoroughly wash all exposed exterior and interior masonry by scrubbing with water and detergent to remove efflorescence, stains, chalk and crayon marks. If efflorescence, stains or marks cannot be removed with water and detergent, follow the recommendations of NCMA-TEK Bulletin 45 for cleaning masonry. Cleaning products shall be compatible with sealers and/or paints. Follow cleaning and removal of stains with a thorough rinse to remove all cleaning materials. Masonry units shall be cleaned, rinsed and dried with clean, nonabrasive rags.

D. Leave work and surrounding surfaces clean, and free of mortar and grout spots, and droppings, stains, and markings. Masonry units shall be ready for sealing or other decoration at the end of the work.

3.14 CLEAN UP

A. Upon completion of the Work, remove materials, equipment, apparatus, tools and the like, and leave the premises clean, neat and orderly.

* * END OF SECTION * *

Division 5 – Metals

SECTION 05100
STRUCTURAL METAL FRAMING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Work includes all labor, materials, facilities, and equipment required to furnish, fabricate and erect metal fabrication work, including, but limited to:

1. Truck door jamb trim angles.
2. Grating and beams for pits.
3. Anchor bolts.
4. Brackets for benches in locker rooms.
5. Stairs, railings, and platforms.
6. Guardrails.
7. Miscellaneous equipment supports.
8. Backing plates in walls.
9. Dock leveler embeds.
10. Shop protective coatings
11. Shop Drawings
12. Quality control.

1.2 WORK EXCLUDED

A. The work of this Section excludes:

1. Metal Fabrication for the connection of Precast Concrete.
2. Grouting and dry packing.

1.3 RELATED WORK

A. The work of this Section shall be closely coordinated with that of:

1. Division 3 – Concrete
2. Section 04200 – Masonry Work
3. Section 05100 – Structural Metal Framing

1.4 REFERENCED STANDARDS

A. Except wherein provisions of these Specifications are more exacting, the Work of this Section shall comply with all applicable provisions of the latest editions of the following standard specifications.

1. Standard Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, of the American Institute of Steel Construction.

2. Code of Standard Practice for Steel Buildings and Bridges, of said AISC.

3. AWS Structural Welding Code - D1.1, of the American Welding Society.

1.5 QUALITY ASSURANCE

A. Materials and fabrication procedures are subject to inspection and tests in the shop and field, by a qualified inspection agency retained by the DISTRICT, as required by the DISTRICT. Such inspections and tests will not relieve the CONTRACTOR of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

B. Should any defects appear in any welds tested by the DISTRICT, repairs shall be similarly inspected at the CONTRACTOR's expense.

C. Promptly remove and replace materials or fabricated components which do not comply.

D. The CONTRACTOR shall establish and execute all Quality Assurance/Quality Control (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

1.6 SUBMITTALS

A. Shop Drawings: Prior to fabrication, provide shop drawings, showing details of members, their connections, welds indication of size and spacing of bolts, erection plans and base setting plans for the execution of the work, showing the marking and position of each member; and be responsible for the correctness of same.

B. Approval of drawings will cover only the general scheme, design, and character of the details, but not the checking of dimensions, nor will such approval relieve the CONTRACTOR from the responsibility for executing his work in accordance with the Contract Drawings.

C. Submit shop drawings in accordance with Section 01300 – Contractor Submittals

1.7 ALTERNATE MATERIALS

A. In general, the CONTRACTOR shall furnish materials of the exact size, shape, weight, and kind provided for on these Drawings and Specifications. However, with the written permission of the Architect, certain alternate sizes may be permitted to improve delivery time or to facilitate construction.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site at such intervals to insure uninterrupted progress of the work. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay that work.

B. Store materials to permit easy access for inspection and identification. Keep steel members off the ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

PART 2 – PRODUCTS

2.1 STRUCTURAL STEEL

A. Structural steel channel and angle shapes, plates, and bars shall conform to ASTM A 36.

B. Pipe shall conform to ASTM A 53, Type E or S, Grade B.

2.2 SHEET STEEL

A. ASTM A 570, Grade 30.

2.3 FASTENERS

A. Machine Bolts (MB) - ASTM A 307.

B. Foundation Bolts (AB) - ASTM A 307.

C. Expansion Bolts – Ramset Red Head or equal.

2.4 HEADED STUDS

A. Nelson or equal, machine applied in strict accordance with the Manufacturer's recommendations.

2.5 GRATING

A. Seidelhuber or equal, 1-1/4 x 3/16, Type 19S4 galvanized steel.

B. Stair Treads: Seidelhuber or equal, 1-1/4 x 3/16, Type 19W4 with checkered plate nosing galvanized steel.

2.6 HANDRAILS

A. Fabricate from ASTM A 53 pipe, using prefabricated bends and fittings.

2.7 WELDING ELECTRODES

A. All arc-welding electrodes shall conform to ASW D1.1, for Steel Arc-Welding Electrodes. E-70 Series, Low Hydrogen, having a minimum yield of 60,000 psi, conforming to ASTM A 233. Electrodes shall be as recommended by their Manufacturers for the positions and other conditions of actual use.

2.8 PAINT

A. Paint shall be Tnemec No. 99 red metal primer, as manufactured by the Tnemec Company, Inc., North Kansas City, Missouri, or equal.

PART 3 – EXECUTION

3.1 PREPARATORY PROVISIONS

A. Provide the necessary templates and diagrams for the setting of anchor bolts and or embeds, in the concrete or masonry.

B. Be jointly responsible for coordination with other Trades for the proper location and installation.

3.2 WORKMANSHIP

A. Workmanship shall be equal to the best of Standard Practices in Modern Structural Shops. After cutting or working component parts of a member, twists, or bends shall be removed before parts are assembled. Finished members shall be free from twists bends and open joints. Members and Sections shall be of sizes, weights, shapes and arrangements indicated, closely fitted and finished true to line and in the precise position to allow accurate erection and proper joining of parts in the field.

3.3 FABRICATION

A. Field measure as required prior to fabrication.

B. All fabrication shall be in conformance with the Standard AISC Specifications herein before cited, and as indicated on the final shop drawings.

C. Execute welding by operators who have been qualified previously by tests as per AWS Part III, Welder Qualification to perform the type of work required. Appearance, quality of welds, and methods of correcting defective work shall be in accordance with AWS, Part IV, Workmanship.

D. Accurately saw cut members to assure full contact of bearing surfaces prior to welding.

E. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut any holes or enlarge holes by burning.

F. Headed studs shall be automatically welded in accordance with Manufacturer’s Specifications.

3.4 PAINTING

A. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC).

B. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer's instructions and at a rate to provide a uniform dry film thickness of 2.0 mils. Use painting methods which will result in full coverage of joints, corners, edges and all exposed surfaces. Paint shall be applied only on dry surfaces. Do not paint in temperatures lower than 45 degrees F., or below dew temperature.

C. Apply one shop coat to all structural metals, except those surfaces to be fireproofed or embedded in concrete or masonry.

3.5 ERECTION

A. Erector must examine the areas and conditions under which metal fabrications are to be installed, and notify the CONTRACTOR in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the erector.

B. Comply with the AISC Specifications and Code of Standard Practice, and as herein specified.

C. Furnish anchor bolts and other connectors required for securing structural metals to foundations, masonry, and other in-place work. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.

D. Provide such temporary shorting and additional bracing as necessary to adequately and safely support any or all loads imposed during construction.

E. See Section 03310 – Structural Concrete, for grouting of base plates.

3.6 CLEAN-UP

A. On completion of this work, the CONTRACTOR shall remove from the site, all excess material, all scaffolding and bracing, and leave the site, insofar as his work is concerned, in proper condition satisfactory to the Architect. Bracing shall be left in place as long as required to hold the structural metals plumb and stable.

* * END OF SECTION * *

Division 6 – Woods and Plastics

SECTION 06110
WOOD FRAMING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor necessary to complete all Rough Carpentry Work as indicated on Drawings or specified herein. Work includes, but is not limited to the following:

1. All wood plates, studs, joist, ledgers, and associated framing.

2. Roof sheathing.

3. Installing miscellaneous structural metals.

4. Rough hardware and fasteners.

5. Preservative treatment of wood sill plates.

6. Quality Control.

1.2 RELATED WORK

A. The Work of this Section shall be closely coordinated with:

1. Section 03310 – Structural Concrete

2. Section 04200 – Concrete Unit Masonry

1.3 WORK COORDINATION

A. This CONTRACTOR shall verify all measurements given on the Drawings by actual measurements at the site. If any major discrepancies are found, immediately notify the Architect before proceeding with the work. Where discrepancies occur, the work shall be adjusted as the DISTRICT may direct without extra cost to the DISTRICT unless the discrepancy is of a major nature.

B. Coordination of the work of all other related trades which may affect wood framing work is a part of this Section.

1.4 REFERENCED STANDARDS

A. NFPA - National Design Specification for Stress Grade Lumber and Its Fastening.

B. APA - PRP-108 Performance Standards.

C. PS-20 American Softwood Lumber Standard.

D. PS-1 Construction & Industrial Plywood.

E. FS TT-W-550 - Wood Preservative, Chromate Copper Arsenate Mixture.

1.5 QUALITY ASSURANCE

A. Identify all lumber and plywood with grade stamp of an agency certified by NFPA.

B. The CONTRACTOR shall establish and execute all Quality Assurance/Quality Control (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

1.6 PRODUCT DATA

A. Submit product data for the following:

1. Framing connectors, if Manufacturer other than indicated on Drawings is used.

B. Wood preservative treatment.

PART 2 – PRODUCTS

2.1 LUMBER

A. All framing lumber shall conform to PS-20 and shall be new, S4S sound and thoroughly seasoned, with a moisture content not exceeding 19% at the time of installation. All grades shall be free of spiral or diagonal grain with slope of grain not over 1 inch in 10 inches. Material grades shall be as follows:

1. All studs, beams, joists, plates and ledgers shall be Douglas Fir No. 1, or better.

2. All blocking, sill plates, bridging and miscellaneous members not listed above, may be Douglas Fir #2 or better.

3. All members in contact with concrete slab-on-grade or concrete stemwalls, shall be treated with a wood preservative equal to Koppers Company "Wolmanized".

2.2 SHEATHING

A. All sheathing shall conform to APA Standards and U.S. Product Standard PS-1. All pieces shall be grade stamped.

1. Roof sheathing shall be 7/8 inch, APA rated sheathing 60/32, Exposure 1 Durability Classification, tongue and groove. Provide Class A/Class 1 fire resistant plywood conforming to ASTM E-84

2.3 ROUGH HARDWARE

A. Anchor bolts for connection of wood sills to concrete, or for connection of ledgers and plates to masonry, shall be of the size shown on the Drawings. Fabricate from full size domestic stock per ASTM A 36 or A 307 stock. Where head or nut bears on wood, provide standard cut washer.

B. Built-up hardware items are specified in Section 05100 - Structural Metal Framing. Fabricate per details shown on the Drawings.

C. Framing connectors noted on the Drawings refer to Simpson Strong-Tie Products. Substitution of products other than those manufactured by Simpson Strong-Tie may be used provided product data is submitted.

2.4 FASTENERS

A. Fasteners shall conform to the following:

1. Nails: Common wire nails or spikes conforming to Federal Specification FF-N-101. Refer to the Drawings for size and spacing. Use galvanized nails at exposed exterior work. Nails for fastening roof sheathing shall be 10d x 2-1/4" x .135 ring-shanked nails.

2. Refer to Drawings for Nailing Schedule for all nailing not specifically identified.

3. Bolts, Nuts and Washers: ASTM A 307.

4. Framing Hardware: Standard connectors as manufactured by the Simpson Company or equal.

PART 3 – EXECUTION

3.1 PRODUCT HANDLING

A. Store materials in a dry location or protect from all sources of moisture, and handle materials in a manner to prevent deterioration, intrusion of foreign matter or damage. Damaged material shall be removed from the premises. Materials with a moisture content exceeding 19% shall be removed from the site or dried to 19% prior to installation in the work.

3.2 ITEMS BUILT INTO CONCRETE OR MASONRY

A. Anchor bolts for connection of sill plates, ledgers, plates, and hold-down hardware shall be of the size shown on the Drawings and shall be accurately located as shown on the Drawings. All bolts shall be installed as the concrete or masonry work proceeds under the direction of this CONTRACTOR.

B. All bolts shall be installed using templates prior to placing concrete. Stabbing of bolts is not permitted.

C. Use extreme care to ensure that hold-down anchor bolts are properly located.

D. Refer to Drawings for construction requirements of placing bolts in masonry.

3.3 FRAMING

A. All work shall be erected true, level, plumb, and square in accordance with the highest standards of workmanship. Framing shall be cut square on bearings, closely fitted, accurately set to required lines and levels, and rigidly secured in place.

B. Install all blocking, bridging and bracing shown on the Drawings as the work progresses. Provide any additional blocking, bridging or bracing necessary to insure the

stability of the structure during construction.

C. Provide and install all wood backing, nailing strips, etc., indicated on the Drawings or required to complete the work. CONTRACTOR shall cooperate with other trades in providing grounds, backing, etc.

D. Any cutting of structural members other than as shown on the Structural Drawings, must be approved by the Architect.

E. Any structural nailing not specifically noted on the Drawings shall be done in accordance with the requirements of the CBC.

F. All rough hardware items shall be installed in strict accordance with the Manufacturer's specifications and in the best workmanlike manner. Unless noted otherwise, framing anchors shall be nailed with Simpson Type N or SSN Nails, as specified by the Manufacturer to provide maximum load capacity.

G. Selection of lumber pieces:

1. Carefully select all members. Select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing, or making of connections.

2. Cut out and discard all defects which will render a piece unable to service it's intended function. Lumber may be rejected by the Architect, whether or not is has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

3. Shimming: Do not shim sills, joists, short studs, trimmers, headers, lintels, or other framing components.

4. Set all horizontal and sloping members with the natural crown up.

H. Install prefabricated wood joist and plate connected wood trusses plumb, level, true to line and in strict accordance with Manufacturer's recommendations.

3.4 SHEATHING

A. Install all sheathing with staggered joints, with face grain, or strands, perpendicular to supports. Leave 1/8 inch gap at panel joints. The minimum sheet dimension shall be 24 inches unless all edges are blocked and nailed with the appropriate edge nailing in accordance with nailing schedules.

B. Sheathing nailing is shown on the Drawings. Where nailing is not specifically shown, use 10d at 6 inches on center at all supported panel edges, and 12 inches on center in the field.

C. Sheathing breaks shall be coordinated with the plate elevations in such a manner as to prevent the breaks between panels from occurring at double top plates of walls. Sheathing shall be extended above the double top plate so the break occurs within the rim joist.

3.5 CLEAN-UP

A. Remove excess material as it accumulates. Do not store or permit debris to accumulate on the site. If CONTRACTOR fails to remove excess debris promptly, Architect reserves the right to cause same to be removed at the CONTRACTOR's expense. Burning will not be allowed.

B. Upon completion of the Work, remove materials, equipment, apparatus, tools and the like and leave premises clean, neat and orderly.

* * END OF SECTION * *

Division 7 – Thermal and Moisture Protection

SECTION 07210
THERMAL INSULATION

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor required to complete all Building Insulation Work as indicated, specified herein, or both. The Work of this Section includes, but is not necessarily limited to the following:

1. Ceiling insulation.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. The Work of this Section shall be closely coordinated with:

1. Section 06110 – Wood Framing

1.3 DELIVERY, STORAGE, AND HANDLING

A. Take special care to keep insulation dry during delivery and storage. Do not install materials that are wet or show evidence of having been wet.

B. Take special care not to puncture vapor barrier. Do not install materials with punctures.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Established Standard: Certain Teed. Other approved manufacturers: Manville or Owens-Corning Fiberglas. Use types to match those listed below. Use widths to completely fill framing spaces.

2.2 INSULATION

A. Ceiling: 13 1/2 inches thick, R-49 Kraft faced thermal insulation.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation shall be in strict accordance with manufacturers printed instructions using specified fasteners.

B. Fill all voids in areas shown to be insulated. Butt batts snugly.

C. Install thermal insulation with vapor barrier towards inside (conditioned space).

D. Clean Up - At completion, remove all unused material, scraps, etc., and legally dispose of off the site.

* * END OF SECTION * *

SECTION 07410
METAL ROOF PANELS

PART 1 – GENERAL

1.1 WORK INCLUDED

A. The work includes, but is not necessarily limited to, furnishing and installation of all preformed metal roofing, fascia, flashing, and accessories as indicated on the Drawings and specified herein.

B. The following is related work that is specified elsewhere:

1. Section 06110 – Wood Framing

2. Section 07900 – Joint Sealants

3. Division 15 – Mechanical

C. Performance Requirements

1. Testing and Certification

a. Wind Uplift: UL 580 test:

1) 24 gauge panels rated Class 90 (Construction #343) when installed over plywood decking, with panel clips spaced 36 inches on center maximum. The roof panel manufacturer must also subscribe to Underwriter's Laboratories' "Follow Up Service" assuring continuing product compliance with UL requirements. Shipment packaging of panels and attachment clips must bear UL Classification markings.

b. Air Infiltration: Panel to meet the following standard when tested in accordance with ASTM E283-84:

1) With factory-applied continuous sealant – 0.14 cfm/lft at 20 psf.

c. Water Penetration: Panel to meet the following standard when tested in accordance with ASTM E331.

1) With factory-applied continuous sealant, no leakage at 20 psf.

PART 2 – PRODUCTS

2.1 SUBMITTALS

A. Product Data

1. Submit manufacturer's technical product data, installation instructions and recommendations for roofing and each type of flashing system required. Include

data substantiating that materials comply with requirements.

B. Samples

1. Prior to ordering products, submit manufacturer's standard color samples for DISTRICT's selection.

2. Prior to starting work, submit three 12" long panel samples showing shape and a representative color chip for DISTRICT's acceptance.

C. Shop Drawings

1. Submit complete shop drawings detailing all fascias, penetrations, perimeter and joint flashings that comply with manufacturer's standard recommendations.

2. Describe all proposed details that deviate from what is shown on the Drawings.

3. Details to allow for expansion and contraction.

D. Site Conditions - Field measure and adjust details to suit actual project conditions prior to finalizing shop drawings.

E. Design Criteria

1. Wind Uplift: The roof system manufacturer shall provide an attachment schedule signed by a Professional Engineer licensed in the State of California along with supporting calculations to substantiate the following uplift loads:

a. Uplift loads as calculated using the most recent edition of the CBC with a130-mph basic wind speed, Exposure C.

2. Drag Loading: The roof panel manufacturer shall provide an attachment schedule signed by a licensed Engineer with supporting calculations to show resistance of drag loads induced by a sloped roof snow load of 182 psf.

F. Submit shop drawings and samples in accordance with Section 01300 – Contractor Submittals

2.2 QUALITY ASSURANCE

A. Installers Qualifications

1. Installer must be approved by the panel manufacturer in writing prior to work commencing.

2. Installer shall meet the following:

a. Successfully applied five metal roofs of comparable size and complexity that reflect a quality and weather-tight installation.

b. Have been in business for a minimum of three years in the State

of California.

B. Manufacturer's Qualifications

1. Manufacturer shall have a minimum of five years experience supplying metal roofing in the State of California.

2. Comply with current independent testing and certification as specified.

3. Manufacturer shall provide proof of liability insurance for their metal roof system.

C. Regulatory Agency Requirements

1. Comply with CBC and applicable Building Code requirements.

2. Compliance with certification must be submitted with shop drawings.

2.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect against damage and discoloration.

B. Handle panels with non-marring slings.

C. Do not bend panels.

D. Store panels above ground, with one end elevated for drainage.

E. Protect panels against standing water and condensation between adjacent surfaces.

F. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.

2.4 PROJECT CONDITIONS

A. Examine the conditions and substrates in which metal roofing work is to be installed. Substrate shall be installed flat and true to avoid panel stresses.

B. Field measurements shall be taken prior to fabrication of panels.

C. Proceed with roofing installation only after it is determined that the substrate is satisfactory to receive roofing.

2.5 WARRANTY

A. Manufacturer's Product Warranty - Manufacture's standard 20 year coating performance warranty.

B. Contractor's Warranty - Warrant panels, flashings, sealants, fasteners and accessories against defective materials and/or workmanship, to remain watertight and weatherproof with normal usage for five years following project substantial completion date.

2.6 The CONTRACTOR shall establish and execute all Quality Assurance (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

2.7 MATERIALS

A. Panels

1. Base Metal -

a. Material: Steel conforming to ASTM A-792 Grade 40, minimum yield 43,500 psi, thickness 24 gauge.

b. Protective Coating: “Zincalume” or equal conforming to ASTM A-792, AZ50

2. Finish - Exterior finish includes a 0.2 mil thick corrosion-resistant primer and a 0.8 mil thick finish coat of Polyvinylidene Fluoride (PVF_2), full 70% Kynar 500/Hylar 5000 for a total of 1.0 mil dry film thickness.

3. Color - Manufacturer’s standard selection of not less than 12 colors.

4. Factory - Applied Sidelap Seam Sealant.

5. Configuration - Standing Seam: Roof panels shall consist of integral self-locking standing seams 1-3/4” high spaced 17” on center with concealed fasteners.

B. Accessories

1. Fastener Clips - 18 gauge Zincalume steel, 40 ksi yield strength, 3-1/2” long triple fastener type.

2. Fasteners - Per manufacturer’s recommendations.

3. Sealant -

a. Gunnable Grade Caulking: Single component urethane caulk.

b. Tape Sealant: Butyl.

4. Pipe Penetrations - West Coast Washer “Flashers Flexible Flashing”, or equal.

C. Flashing - Material, gauge, and finish to match panels.

D. Fabrication

1. Unless otherwise shown on Drawings or specified herein, fabricate panels in continuous one-piece lengths and fabricate flashings and accessories in longest practical lengths.

2. Roofing panels shall be factory formed. Field formed panels are not

acceptable.

PART 3 – EXECUTION

3.1 EXAMINATION – EXISTING CONDITIONS

A. Verify that members to receive panels are complete, in a true plane, secure and otherwise properly prepared.

B. Prior to starting work, notify CONTRACTOR about defects requiring correction.

C. Do not start work until conditions are satisfactory.

3.2 PREPARATION

A. Field Measurements

1. Verify prior to fabrication.

2. If field measurements are significantly different from drawing dimensions, notify DISTRICT prior to fabrication.

B. Protection

1. Treat or isolate with protective material, any contacting surfaces of dissimilar materials to prevent electrolytic corrosion.

2. Require workers who will be walking on roofing panels to wear clean, soft-soled work shoes that will not pick up stones or other abrasive material that could cause damage and discoloration.

3. Protect work of other trades against damage and discoloration.

C. Surface Preparation - Clean and dry surfaces prior to applying sealant.

3.3 INSTALLATION

A. Underlayment

1. Provide ice and water shield underlayment as shown on the Drawings.

2. Install in accordance with manufacturer’s specifications.

B. Panels

1. Follow roof panel manufacturer’s directions.

2. Install panel seams vertically.

3. Lap panels away from prevailing wind direction.

4. Do not stretch or compress panel side-lap interlocks.

5. Secure panels without warp or deflection.

6. Fully engage interlocking seams.

7. Painted panels shall be shipped with plastic sheeting or a strippable film coating between all panels. Remove any strippable film coating prior to installation and in any case, do not allow the strippable film coating to remain on the panels in extreme heat, cold, or in direct sunlight or other UV source.

C. Allowable Erection Tolerance

1. Maximum Alignment Variation: 1/4 inch in 40 feet.

D. Flashing

1. Follow manufacturer's directions and shop drawings approved by the DISTRICT.

2. Install flashings to allow for thermal movement.

3. Remove any strippable protective film, if used, immediately preceding flashing installation.

4. Cutting and Fitting

a. Neat, square and true saw cuts. Torch cutting is prohibited.

b. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.

c. Where necessary to saw cut panels, debur, and treat with galvanic paint.

3.4 CLEANOUT AND CLOSE OUT

A. Panel Damage and Finish Scratches

1. Do not apply touch-up paint to damaged paint areas that involve minor scratches.

2. Panels or flashings that have severe paint and/or substrate damage shall be replaced as directed by the DISTRICT's representative.

B. Cleaning and Repairing

1. At completion of each day's work and at work completion, sweep panels and flashing clean. Do not allow fasteners, cutting, fittings or scraps to accumulate.

2. Remove debris from project site upon work completion.

* * END OF SECTION * *

SECTION 07740
METAL SOFFIT PANELS

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor to complete all Work as indicated specified herein or both. The work of this section includes, but is not necessarily limited to, the following:

1. Metal soffit panels and fascia.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 07410 - Metal Roof Panels.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

D. Sample Warranties: For special warranties.

E. Submit shop drawings and information in accordance with Section 01300 – Contractor Submittals.

1.4 QUALITY ASSURANCE

A. The CONTRACTOR shall establish and execute all Quality Assurance/Quality Control (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Upload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Remove strippable protective covering on metal panels following installation.

1.6 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturer's written instructions and warranty requirements.

1.7 COORDINATION

B. Coordinate metal panel installation with metal fascia, flashing, trim, construction of walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.

b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Final Completion.

D. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory applied finishes with specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.

b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Final Completion.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.

2. Other Design Loads: As indicated on Drawings.

3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METAL SOFFIT PANELS

A. General: Provide metal soffit panels designed to be installed by lapping and interconnection side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weather-tight installation.

1. Basis-of-Design Product: Subject to compliance with requirements, provide “Firestone Unaclad UC-500 with 12” spacing” and vented where required or comparable product by one of the following:

a. AEP Span; a BlueScope Steel company.

b. Metal Sales Manufacturing Corporation.

2. Material: Same material, finish, and color as metal roof panels and metal fascia.

3. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 24ga.

b. Exterior Finish: Two-coat fluoropolymer.

c. Color: As selected by DISTRICT from manufacturer's full range.

4. Panel Coverage: 12 inches.

5. Panel Height: 1.0 inch.

2.3 MISCELLANEOUS MATERIALS

A. Panel Accessories: Provide components required for a complete, weather-tight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closure-Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.

C. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

D. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch wide and 1/8 inch thick.

2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

PART 3 – EXECUTION

3.1 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weather-tight seal and prevent metal-to-metal contact, and that minimize noise from movements.

1. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

2. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

3.2 FINISHES

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal panel manufacturer.

2. Examine sheathing to verify that sheathing joints are supported by framing or blocking and that installation is with flatness tolerances required by metal panel manufacturer.

a. Verify that air- or water-resistive barriers been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plum substrates receiving metal panels.

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashing that will be concealed by metal panels are installed.

3. Locate and space fastenings in uniform vertical and horizontal alignment.

4. Install flashing and trim as metal panel work proceeds.

5. Provide weather-tight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action is recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items true to line for neat and weathertight enclosure.

2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.

3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.

4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommended by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.

2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if no indicated, provide types recommended by metal panel manufacturer.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that re permanently watertight.

1. Install exposed flashing and trim that is without buckling, and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be waterproof, form expansion joints of intermeshing hooked flanges, no less than 1 inch deep, filled with mastic sealant (concealed with joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

* * END OF SECTION * *

SECTION 07900
JOINT SEALANTS

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor required to complete all Sealants & Caulking Work as indicated, specified herein, or both. The Work of this section includes, but is not necessarily limited to the following:

1. Mechanical and Electrical Penetrations – CMU walls.

2. Roof and roof accessories.

3. Miscellaneous joints.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Related Work Specified Elsewhere - Refer to the various sections for particular sealant locations and requirements, including materials and methods different from these specified in this Section.

1. Section 04200 – Concrete Unit Masonry

2. Section 06110 – Wood Framing

3. Section 07410 – Metal Roof Panels

4. Section 08511 – Aluminum Windows

5. Section 09910 – Painting

6. Division 15 – Mechanical

7. Division 16 – Electrical

1.3 SUBMITTALS

A. Submit product data in accordance with Section 01300 – Contractor Submittals

1.4 QUALITY ASSURANCE

A. Quality Assurance shall be as follows:

1. Use only workmen skilled and trained in the techniques of sealants and caulking and who are completely familiar with the published recommendations of the manufacturers of sealants and caulking being used.

2. Maintain complete manufacturer's installation directions for all products at the job site throughout installation.

3. Furnish products to comply with the referenced Federal Specifications (Fed Spec.).

B. The CONTRACTOR shall establish and execute all Quality Assurance/Quality Control (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Materials shall be as follows:

1. Sealants: One part polyurethane, Fed. Spec. TT-S-00230C.

2. Silicone Sealant: G.E. Silpruf, Dow or Tremco.

3. Caulking: Butyl, Fed. Spec. TT-S-001657, Type 1.

4. Joint Backer: One-piece open or closed cell polyurethane or polyethylene foam rod or tape filler as recommended by sealant or caulking manufacturer.

5. Primer and Cleaners: As recommended by sealant or caulking manufacturer.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation shall be provided as follows:

1. Clean all surfaces thoroughly and carefully. Apply primer to those surfaces which sealant manufacturer recommends be primed. Take care that adjacent surfaces are not smeared. Use masking tape where necessary for protection.

2. Use one-piece backer rod about 1/3 to 1/2 wider than width of joint so sufficient pressure is exerted by filler to provide substantial resistance to displacement.

3. Install joint backer rod for backup to control limits for receiving sealant as recommended by sealant manufacturer. Use blunt tools. Remove and replace all broken and punctured rods.

4. If joint is too shallow for use of backer rod, apply bond breaker to back of joint as recommended by sealant manufacturer. If bond breaker is used, apply it carefully to avoid prevention of sealant bond to sides of joints.

5. Use guns where possible to insure penetration and density. Finish joint densely and completely filled, producing a smooth surface.

6. Do not install during freezing weather or beyond temperature limits set by manufacturer, or against wet or damp materials. Protect installed sealant from dust and dirt.

3.2 APPLICATION

A. Application shall be as follows:

1. Sealant: At all exterior locations except floors, and at interior joints subject to movement.

2. Caulking: At interior locations not subject to movement, unless noted otherwise.

3. Silicone Sealant: At interior locations subject to moisture, including countertops, unless noted otherwise.

3.3 CLEANUP

A. Clean Up - Clean off excess materials from joints and surrounding surfaces. Remove discarded cartridges and other debris.

* * END OF SECTION * *

Division 8 – Doors and Windows

SECTION 08100
HOLLOW METAL DOORS AND FRAMES

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Work Included - Furnish all materials and labor required to complete all Steel Doors & Frames Work as indicated, specified herein, or both. The Work of this section includes, but is not necessarily limited to the following:

1. Steel doors and frames.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Work under this Section shall be closely coordinated with:

1. Section 04200 – Concrete Unit Masonry

2. Section 08710 – Door Hardware

3. Section 09910 - Painting.

1.3 REFERENCED SPECIFICATIONS

A. Referenced Specifications

1. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames, and Builder's Hardware.

2. SDI-100 - Standard Steel Doors and Frames.

3. SDI-105 - Recommended Erection Instructions for Steel Frames.

1.4 QUALITY ASSURANCE

A. Quality Assurance

1. Conform to requirements of SDI-100.

2. Coordinate window frame fabrication with window and glazing.

B. The CONTRACTOR shall establish and execute all Quality Assurance per Section 01400 – Quality Assurance and Quality Control.

1.5 SUBMITTALS

A. Submittals

1. Submit shop drawings in accordance with Section 01300 – Contractor Submittals.

2. Indicate frame configuration, anchor types and spacing, location of cutouts for hardware, reinforcement, and finish.

3. Indicate door elevations and internal reinforcement.

B. Delivery, Storage and Protection

1. Store products under cover in a dry, weatherproof enclosure.

2. Protect doors and frames with resilient packaging.

PART 2 – PRODUCTS

2.1 MANUFACTURES

A. Acceptable Manufacturers - Curries is the recognized standard, or equal products are acceptable.

B. Doors and Frames

1. Exterior Doors: Curries 707 series 18 gauge polyurethane core ANSI/SDI-100 Grade Full Flush.

2. Exterior Frames: 14 gauge, welded and ground smooth corner.

3. Steel: ASTM A 366, commercial quality, stretcher level sheet.

C. Door Core - Core: Polyurethane insulation.

D. Accessories

1. Rubber Silencers: Resilient rubber.

2. Countersunk flathead screw anchors.

E. Protective Coatings

1. Bituminous Coating: Fibered asphalt emulsion.

2. Primer: Zinc chromate.

F. Finish - Primer: Baked on.

2.2 FABRICATION

A. Fabrication – Doors

1. Construction: Flush and seamless, 18 gage face sheets reinforced internally and fully bonded to polyurethane core. Close top and bottom edges with continuous 16-gage channel. Finish top of exterior doors with flush channel filler, sealed.

2. Hardware reinforcement shall be factory drilled and tapped for template hardware:

a. Hinges: 7 gage.

b. All other: 12 gage.

3. Provide metal Z or T shaped astragals for double doors. Coordinate with weather-stripping - see Hardware Schedule.

B. Fabrication – Welded Frames

1. Construction: 14 or 16 gauge welded steel units, corners mitered, continuous welded, and ground smooth. Form as detailed.

2. Door frames shall be Series SF 6-3/4 x 2” x 14 gauge.

3. Hardware reinforcement shall be factory drilled and tapped for template hardware:

a. Hinges: 7 gage.

b. All Other: 12 gage.

c. Mortar Guards for Grouted Frames: 26 gage.

4. Punch for and provide three rubber silencers at singe doors, two at pairs.

5. Anchors: Provide floor clips welded to door frames. Provide three suitable wall anchors per jamb for door openings to 7 feet. Provide additional anchors for frames over 7 feet.

6. For frames to be anchored through face, punch and dimple frame, and provide flat head bolts or screws.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation

1. Install frames in accordance with SDI-105.

2. Install doors in accordance with DHI.

3. Coordinate with CMU wall construction for anchor placement.

4. Install all frames plumb, neatly and securely as detailed.

5. Where CMU frames are anchored with bolts through face, fill heads with metal putty, grind smooth and touch up with prime paint.

6. Install all doors square, neatly, and to operate freely without binding.

B. Tolerances - Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.3 CLEANUP

A. Adjusting and Cleaning - Adjust hardware for smooth and balanced door movement.

* * END OF SECTION * *

SECTION 08361
OVERHEAD COILING DOORS

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following types of rolling overhead doors:

1. Doors with steel-framed steel insulated panels.

1.2 DEFINITIONS

A. Operation Cycle: One complete cycle of a door begins with the door in the closed position. The door is then moved to the open position and back to the closed position.

1.3 PERFORMANCE

A. Performance requirements are as follows:

1. Structural Performance - Provide rolling overhead doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components:

a. Wind Load: ANSI/DASMA 10-1996 standards and as required by code (for Design Wind Speed = 130 mph).

2. Operation-Cycle Requirements - Design rolling overhead door components and operator to operate a minimum of 25 cycles per day for not less than an overall maximum 50,000 cycles.

1.4 SUBMITTALS

A. Submittals shall be as follows:

1. Product Data: For each type and size of rolling overhead door an accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:

a. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.

2. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

1.5 QUALITY ASSURANCE

A. Quality Assurance shall be as follows:

1. Installer Qualifications: Engage an experienced installer who is an authorized representative of the rolling overhead door manufacturer for both installation and maintenance of units required for this Project.

2. Manufacturer Qualifications: Engage a firm experienced in manufacturing rolling overhead doors similar to those indicated for this Project and with a record of successful in-service performance.

3. Source Limitations: Obtain rolling overhead doors through one source from a single manufacturer.

4. Product Options: Drawings indicate size, profiles, and dimensional requirements of rolling overhead doors and accessories and are based on the specific system indicated. Other manufacturers' systems with equal performance and dimensional characteristics may be considered. Refer to Division 1 Section "Substitutions".

B. The CONTRACTOR shall establish and execute all Quality Assurance per Section 01400 - Quality Assurance and Quality Control.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:

1. The Cookson Company

a. Type FCWI - Chain Operated Insulated Service Door.

2.2 MATERIALS

A. The door curtain shall be constructed of interconnected strip steel slats conforming to ASTM A-526. The slats shall be designated by The Cookson Company as No. 44 (measuring 3” high by 7/8” deep) consisting of a 22 gauge exterior slat and a 24 gauge interior slat separated by 13/16” of rigid insulation (Type FCWI). The curtain insulation shall not produce a flame spread greater than 25 and a smoke generation greater than 50.

B. The finish on the door curtain shall be Cookson FinalCote consisting of the following:

1. Hot dipped galvanized G-90 coating consistent with ASTM A-525

2. Bonderized coating for prime coat adhesion

3. Corrosion inhibiting primer - .2 mils per side

4. Thermo-setting tan polyester top coat with a minimum thickness of .6 mils each side.

C. The bottom bar shall consist of two 1/8” angles mechanically joined together with a 1” diameter vinyl covered foam edge astragal continuous along the bottom. The finish on the bottom bar shall be one (1) coat of bronze rust-inhibiting prime paint.

D. The guides shall consist of 3 steel angles bolted together with 3/8” fasteners to form a channel for the curtain to travel. Extruded vinyl snap-on weather-stripping shall be furnished continuously along the exterior leg of each guide. The wall angle portion shall be continuous and fastened to the surrounding structure with either minimum 1/2” fasteners or welds, both on 36” centers. The finish on the guide angles shall be one (1) coat of bronze rust-inhibiting prime paint.

E. The brackets shall be constructed of steel not less than 1/4” thick and shall be bolted to the wall angle with fasteners not less than 1/2” in diameter. The finish on the brackets shall be one (1) coat of bronze rust-inhibiting prime paint.

F. All gears shall be cast iron with teeth cast from machine cut patterns. The pinion gear shall not be less than a 3” pitch diameter. The gear ratio shall be designed for a maximum effort of not more than 30 pounds.

G. The barrel shall be steel tubing of not less than 6” (Type FCWI) in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the width of the curtain. The barrel shall be designed to limit the maximum deflection to .03” per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.

H. The hood shall be fabricated from 24 gauge galvanized steel and shall be formed to fit the curvature of the brackets. The hood shall be corrugated every 1” along the curvature for the entire length of the hood. The hood shall contain a waterproof canvas baffle to control air infiltration. The finish on the hood shall be the Cookson FinalCoat finish as indicated in the curtain section.

2.3 OPERATION

A. Chain operated doors shall be open and close with a maximum of 30 pounds of effort utilizing an endless chain and cast iron reduction gears.

B. In addition to the chain lock, door shall also be provided with bottom bar locks.

2.4 LOCKING MECHANISMS

A. The door chain shall be secured by means of a chain lock.

B. Include bottom lock bar installed per manufactures instructions.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examination shall be as follows:

1. Examine wall and overhead areas, including opening framing and blocking, with Installer present, for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of work of this Section.

a. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Installation shall be as follows:

1. General: Install door, track, and opening equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to Shop Drawings, manufacturer's written instructions, and as specified.

B. Adjusting - Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion, and fitting weathertight for entire perimeter.

C. Warranty:

1. Provide twelve (12) month warranty against defects in workmanship and materials.

* * END OF SECTION * *

SECTION 08511
ALUMINUM WINDOWS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Furnish all labor and materials necessary to provide and install. Solid and tubular aluminum extruded windows of the following type:

1. Picture Window - Series 710, 710S, 910C, 910S, 911C, 1185H, 1285H.

1.2 RELATED WORK

A. The Work of this Section includes, but is not necessarily limited to the following:

1. All labor, materials, facilities and equipment required to furnish, fabricate and install all windows as noted on the construction drawings.

2. Painting of frames.

3. Coordination of all dimensions and details of framing requirements and with all other trades.

1.3 RELATED SECTIONS

A. Section 04200 – Concrete Unit Masonry.

1.4 SUBMITTALS

A. Submittals shall be provided as follows:

1. Product Data.

2. Shop Drawings: Include window schedule, window elevations, sections and details and multiple window assembly details.

3. Qualifications: Proof of manufacturer’s qualifications.

4. U-Factor and structural rating charts required for AAMA and NFRC labeling requirements.

5. Installation Instructions - AAMA 2400 (“Mounting Flange Installation”) or AAMA 2410 (“Flush Fin Installation”).

6. Maintenance instructions.

7. Special Warranties.

B. Submit shop drawings and information in accordance with Section 01300 – Contractor Submittals.

1.5 QUALITY ASSURANCE

A. Overall Standards: Comply with ANSI/AAMA 101.1.S.2, except as otherwise noted herein.

B. Qualifications:

1. Manufacturer Qualifications:

a. Minimum five years' experience in producing aluminum windows of the type(s) specified.

b. Member AAMA, NFRC.

C. The CONTRACTOR shall establish and execute all Quality Assurance/Quality Control (QA/QC) per Section 01400 - Quality Assurance and Quality Control.

1.6 DELEIVERY, STORAGE, AND HANDLING

A. Follow manufacturer's instructions on label applied to windows.

1.7 WARRANTY

A. Commercial Special Warranty:

1. 10-year guarantee.

2. Guarantee windows against defects in manufacturing and workmanship including costs for parts and labor.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. A. Milgard Manufacturing, Inc., or approved equal. Tel: 1.800.MILGARD (645-4273), (253) 922-2030. FAX: (253) 926-0848. Web: milgard.com.

2.2 MATERIALS

A. Aluminum: Comply with requirements of AAMA/WDMA/CSA 101/I.S.2/A440-05, 6063-T5 temper for strength, corrosion resistance and application of require finish.

B. Extruded frame members are to be .060" in thickness for structural walls.

2.3 GENERAL PERFORMANCE REQUIREMENTS

A. Thermal Performance: Comply with NFRC 100.

B. Air Leakage, Water Resistance, Structural Test: Comply with ANSI/AAMA 101/I.S.2.

C. Forced-Entry Resistance: Comply with ASTM E 558.

2.4 WINDOW TYPES

A. Picture Window and Radius - 710 Series, 1 inch nail fin setback:

1. Frame:

a. 710 Series, 2 1/16”.

2. Performance Class:

a. 710 Series, 95 ½” x 71 ½” and smaller: FW-HC40.

b. 910C, 910S & 911C Series, 95 ½” x 71 ½” and smaller: FW-HC45.

c. R-15 & R-15S Series, 71 1/2” x 71 ½” and smaller: FW-HC40.

d. 1185H Series, 71 ½” x 71 ½” and smaller: FW-HC45.

e. 1285H Series, 71 ½” x 71 ½” and smaller: FW-C35.

2.5 GLAZING

A. Double Pane Tempered Glass:

1. Glazing Type: Clear.

2.6 FABRICATION

A. Fabricate frames and sash with mechanically joined corners. Corners are fastened with corrosion resistant screws and sealed with an acrylic sealant.

B. All fixed glass is exterior glazed and all sashes are marine glazed with flexible PVC glazing. The fixed glazing shall be removed without disassembly of a sash. The vents will need to be disassembled to replace the glazing.

2.7 FINISHES

A. Frame and Sash Color: Painted Exterior Finish: Equaling 0.3 mils dry film thickness to AAMA 603.8-92

B. Color to be selected by the DISTRICT.

2.8 SOURCE QUALITY CONTROL

A. Windows inspected in accordance with manufacturer’s Quality Control Program as required by AAMA Gold Label certification.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine openings in which windows will be installed.
B. Coordinate with responsible entity to correct unsatisfactory conditions.

C. Commencement of work by installer is acceptable of substrate conditions.

3.2 INSTALLATION

A. Install windows in framed walls in accordance with AAMA 2400 (“Mounting Flange Installation”) or AAMA 2410 (“Flush Fin Installation”).

B. Do not remove temporary labels.

3.3 CLEANING

A. Remove temporary labels and retain for Closeout Submittals.

B. Clean soiled surfaces and glass using a mild detergent and warm water solution with soft, clean cloths.

* * END OF SECTION * *

SECTION 08710
DOOR HARDWARE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Furnish and install all finish door hardware as shown and specified.

1.2 RELATED WORK

A. Related Work Specified Elsewhere is as follows:

1. Section 08100 – Hollow Metal Doors & Frames

1.3 SUBMITTALS

A. Submittals shall be provided as follows:

1. Submit complete hardware schedule. Include manufacturer's names with model numbers.

2. Submit cut sheet, for each item listed in schedule.

3. Submit template information as required to door and frame suppliers.

4. Provide keys.

5. Submit operating and maintenance instructions for closers and all other adjustable items.

B. Submit shop drawings in accordance with Section 01300 – Contractor Submittals

C. Delivery and Storage shall be provided as follows:

1. Deliver all hardware to jobsite neatly and carefully packaged and clearly labeled by item number for each opening.

2. Schedule deliveries to avoid construction delay.

3. Store all hardware in a locked room, until installation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers - The following manufacturers have been used for the items listed in the hardware sets. Or equal manufacturers except for locksets, are acceptable provided they furnish items comparable or superior to those listed below:

1. General Lock: Locksets – Grade 1 Lever, L153R 626 C 234 S ANSI S

2. LCN: Closers.

3. Rockwood: Door Stops.

4. Pemko: Weather-stripping, thresholds & astragals.

5. Hager: Hinges.

6. Trimco: Flush Bolts.

2.2 MATERIALS

A. Finishes - Unless noted otherwise, use the following finishes:

1. All Items, Unless Otherwise Noted: US26D (626) satin chrome.

B. Locksets – Schlage ALPD-SAT Series with corrosion resistant interior parts. Locksets shall have access to the cylinder without removing the lockset from the door.

1. Backset for Locks and Latches: 2-3/4 inches.

2. Trim Design: Litchfield LF x 626 and Augusta AU 5400LN.

C. Exposed Closers shall comply with the following:

1. Closers: Rack and pinion type with separate spring power adjustment and adjustable back check, non-handed, with rectangular finish cover. If multiple size closers are not specified, provide closers of size recommended by manufacturer for door size and conditions of use.

a. Indicate regular or parallel arm (and size) in submitted hardware schedule for each door according to the following order of precedence:

1) Locate exterior door closers on inside.

2. Provide appropriate brackets wherever necessary to allow proper installation of closers.

3. Unless prevented by adjacent construction, install closers to allow 180 degree opening of doors.

D. Hinges shall comply with the following:

1. Number of hinges per door leaf: Three

2. Butt hinge size by door leaf width:

a. To 36 Inches: 4-1/2 inches x 4-1/2 inches.

b. Over 36 Inches: 5 inches x 4-1/2 inches.

3. Furnish butt hinges to comply with the following requirements:

a. Exterior Doors: Non-removable pins when door is closed, solid brass or bronze.

b. Doors With Closers: Oil bearing or ball bearing.

E. Strikes - Use strikes with extended lips to protect frame or door from latch bolts, but which do not project more than 1/8 inch beyond frame or door leaf. Include box.

F. Fastenings shall be as follows:

1. Furnish finish hardware with all necessary screws, bolts, or other fastenings of suitable size and type to anchor the hardware in position for heavy use and long life, finished to harmonize with the hardware material and finish.

2. Furnish these fastenings where necessary with expansion shields, sex bolts, toggle bolts, or other approved anchors according to the materials to which it is applied, and as recommended by the manufacturer. Fasten all hardware to concrete or masonry, with machine screws and expansion shields.

G. Key and Keying shall be as follows:

1. Construction Keying: Provide a method independent of the final keying system for securing the building during construction.

2. Final Keying System:

a. Stamp all keys "DO NOT DUPLICATE".

b. Masterkey all locks in accordance with the DISTRICT's instructions.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation shall comply with the following:

1. Install all finish hardware in coordination with installation of all doors so that all doors operate freely, without binding, and so that all hardware functions as indicated.

2. Furnish hardware to comply with all applicable building codes. All exit doors shall be operable from the inside without the use of a key.

3. Notify DISTRICT of all conditions that prevent functional operation, or guarantee requirements for doors at the time of shop drawing submittal. Failure to notify of such conditions at this time indicates acceptance by CONTRACTOR of conditions. Make subsequent changes required because of this failure to notify at no additional cost to the DISTRICT.

4. Protect all installed hardware until completion. Remove and replace damaged hardware.

B. Door Hardware Schedule:

1. GROUP 1 – DOOR 1

a. Hinges – Hager BB1191, 4-1/2" x 4-1/2" US32D NRP

b. Lockset – Schlage AL53PD-SAT 626

c. Pemko Threshold – 272A

d. Pemko Weather-strip – PK 55D

e. Pemko Weather-strip – 18061 CNB

f. Flush Bolts – 3917 – 12” x 3917 – 12”

g. Astragal – 355CS

* * END OF SECTION * *

Division 9 – Finishes

SECTION 09910
PAINTING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Furnish all materials and labor required to complete all Painting Work as indicated, specified herein, or both. The Work of this section includes, but is not necessarily limited to the following:

1. Surface preparation.

2. Surface finishing.

3. Color selection schedule.

1.2 RELATED WORK

A. The Work of this Section shall be closely coordinated with that of:

1. Section 05510 – Structural Metal Framing

2. Section 06110 – Wood Framing

3. Section 08100 – Hollow Metal Doors & Frames

4. Division 15 – Mechanical

5. Division 16 – Electrical

1.3 REFERENCED STANDARDS

A. ANSI/ASTM D 16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

1.4 DEFINITIONS

A. Conforms to ANSI/ASTM D 16 for interpretation of terms used in this Section.

1.5 QUALITY ASSURANCE

A. Quality Assurance shall be as follows:

1. Product Manufacturer: Company specializing in manufacturing quality paints and finish products with five years experience.

2. Applicator: Company specializing in commercial painting and finishing with three years documented experience.

3. Maintain at the job site complete manufacturer's installation instructions for each type of paint to be used. Comply with such instructions and apply all materials to achieve the minimum dry mil thickness recommended by the

manufacturer.

4. The DISTRICT may inspect each coat and operation before succeeding coats are applied to determine that the work meets the requirements of the Specifications in all regards, including uniform color, coverage and texture. He may check completed paint surfaces for dry film thickness as measured by a Tooke's Gauge. Additional coats will be required at no additional cost should uniform color, coverage, and texture not be achieved, or if dry film measures indicate thicknesses substantially less than those recommended by the paint manufacturer. Make a Tooke's Gauge available for use as required.

1.6 SUBMITTALS

A. Submittals shall be provided as follows:

1. If products other than those specified are proposed, submit product data on all finishing products per the DISTRICT's instructions.

2. Submit color samples illustrating range of colors available for each surface-finishing product scheduled, for selection.

B. Submit shop drawings in accordance with Section 01300 – Contractor Submittals

C. Delivery, Storage and Handling shall be provided as follows:

1. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.

2. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

3. Store paint materials at minimum ambient temperature of 45 degrees F, and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions. On-site storage shall be only as directed by the CONTRACTOR.

4. Take precautionary measures to prevent fire hazards and spontaneous combustion. Remove rags and waste soiled with paint from the site at the end of each day's work, or store in metal containers with tight metal covers.

D. Environmental Requirements shall be provided as follows:

1. Use only materials that comply with the local area AQMD Regulations.

2. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

3. Do not apply exterior coatings during wind, rain, or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

4. Minimum application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

5. Provide lighting level of 80-foot candles measured mid-height at substrate surface.

E. Extra Stock shall be as follows:

1. Provide a one-gallon container of each color and surface texture to the DISTRICT.

2. Label each container with color, texture, and room locations, in addition to the manufacturer's label.

PART 2 – PRODUCTS

2.1 MANUFACTURES

A. Acceptable Manufacturers - Paint - Paint Schedule specifies Sherwin Williams Products. Or equal products are acceptable.

2.2 MATERIALS

A. Materials shall be as follows:

1. Coatings: Ready mixed, except catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating. Good flow and brushing properties; capable of drying or curing free of streaks or sags.

2. Should manufacturer's numbers of specifications change, use their latest equal or better product. Regardless of manufacturer or product used, apply the number of coats required in these Specifications.

3. Use primers and succeeding coats of any given system from the same manufacturer.

4. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified of commercial quality.

5. No thinning, reducing or changing of mix is permitted unless specifically required by paint manufacturer.

B. Finishes shall be as follows:

1. Refer to schedule at end of Section, for surface finish schedule.

PART 3 – EXECUTION

3.1 INSPECTION

A. Inspection shall be provided as follows:

1. Verify that surfaces and substrate conditions are ready to receive work as instructed by the product manufacturer.

2. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

3. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

a. Wood: 12 percent.

4. Beginning of installation means acceptance of existing surfaces and substrate.

3.2 PREPARATION

A. Preparation shall be as follows:

1. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.

2. Correct minor defects and clean surfaces that affect work of this Section.

3. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

4. Galvanized Surfaces: Remove surface contamination and oils, and wash with solvent. Apply coat of etching primer. Galvanized handrail and guardrail does not require painting.

5. Un-coated Steel Surfaces: Remove grease, scale, dirt, and rust. Where heavy coating of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

6. Shop Prime Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

7. Metal Doors: Seal top and bottom edges with primer.

B. Protection shall be as follows:

1. Protect elements surrounding the Work of this Section from damage or disfiguration.

2. Repair damage to other surfaces caused by Work of this Section.

3. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

3.3 APPLICATION

A. Application shall be as follows:

1. Apply products in accordance with manufacturer's instructions.

2. Do not apply finishes to surfaces that are not dry.

3. Apply each coat to uniform finish.

4. Apply each coat of paint slightly darker than preceding coat.

5. Sand lightly between coats to achieve required finish.

6. Allow applied coat to dry before next coat is applied.

7. The finished work shall show no cloudiness, spotting, holidays, laps, brush marks, runs, curtains, sags, ropiness, or other surface deviations or imperfections not consistent with first-class workmanship.

8. Use spray application for metal surfaces for a smooth finish appearance.

9. Remove and refinish all work which shows carelessness, lack of skill in the execution, or which is defective due to any other cause.

B. Finishing Mechanical and Electrical Equipment shall be as follows:

1. Refer to Division 15 & 16 for finish schedule.

2. Paint shop primed equipment.

3. Paint exposed ductwork.

4. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

5. Replace identification markings on mechanical or electrical equipment when painted accidentally.

6. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

C. Cleaning shall be provided as follows:

1. As Work proceeds, promptly remove paint where spilled, splashed or spattered.

2. During progress of Work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

3. Collect cotton waste, cloths, and materials which may constitute a fire hazard, place in closed metal containers and remove daily from site.

D. Schedule shall be as follows:

1. All exterior exposed surfaces, except pre-finished items, are to be painted. See Finish Schedule for interior painting.

2. Sherwin Williams Products are specified below as established standard and have been obtained from the latest information available. Should manufacturer's numbers of specifications change, use their latest equal or better product.

E. Schedule – Exterior Surfaces as follows:

1. Paint materials shall be the highest grade available from approved manufacturer.

2. All exterior finishes shall have a minimum dry film thickness of 3 mils.
3. Masonry Sealer:

a. One coat Enviroseal Double 7 H.D. as Manufactured by ChemRex Inc., applied at a rate of 30 SF to 60 SF/gallon.

4. Steel - Shop Primed:

a. Touch-up: Pro Industrial Pro Cryl Universal Acrylic Primer.

b. Two coats: Pro Industrial DTM Acrylic Semi-Gloss.

5. Steel – Galvanized:

a. One coat: Pro Industrial Pro Cryl Universal Acrylic Primer.
b. Two coats: Pro Industrial DTM Acrylic Semi-Gloss.

F. Schedule – Interior Surfaces as follows:

1. Paint material shall be the highest grade available from approved manufacturer.

2. All interior finishes shall have a minimum dry film thickness of 3 mils, unless otherwise noted.

3. Hollow Metal Casings and Doors (P-5):

a. One coat (touch-up): DTM Acrylic Primer Finish B66W1.

b. Two coats: ProMar 200 Interior Latex Semi-Gloss B31W200 Series.

4. Wood Trim and plywood:

a. One coat: Preprite Problock Interior/Exterior Latex Primer/Sealer.

b. Two coats: A-100 Exterior Latex.

G. Schedule – Colors - Colors to be selected by Owner from manufacturer's standard color samples.

* * END OF SECTION * *

Division 11 – Equipment

SECTION 11210
PUMPS AND EQUIPMENT

PART 1 – GENERAL

1.1 REQUIREMENTS

A. The CONTRACTOR shall perform all work required for installation of the pumping system, variable frequency drive, system controller and hydropneumatic pressure tank including but not limited to mounting pump and equipment to concrete pads, completing all pipe connections, completing all electrical and control wiring, and testing all equipment.

1.2 WORK INCLUDED

A. A variable speed packaged pumping system including five vertical turbine single-stage pumps with motors, variable speed pump controls, inlet and outlet manifolds, and 400 gallon hydropnuematic pressure tank with compressor.

1.3 REFERENCE STANDARDS

A. The work in this section is subject to the requirements of applicable portions of the following standards:

1. Hydraulic Institute

2. ANSI – American National Standards Institute

3. ASME – American Society of Mechanical Engineers

4. ASTM – American Society for Testing and Materials

5. IEEE – Institute of Electrical and Electronics Engineers

6. NEMA – National Electrical Manufacturers Association

7. NEC – National Electrical Code

8. ISO – International Standards Organization

9. UL – Underwriters Laboratories, Inc.

1.4 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

PART 2 – PRODUCTS

2.1 VARIABLE SPEED PACKAGED PUMPING SYSTEM

A. Furnish and install a pre-fabricated and tested variable speed packaged pumping system to maintain constant water delivery pressure.

B. The packaged pump system shall be a standard product of a single pump manufacturer. The entire pump system including pumps and pump logic controller, shall be designed, built, and tested by the same manufacturer.

C. The complete packaged water booster pump system shall be certified and listed by UL (Category QCZJ – Packaged Pumping Systems) for conformance to U.S. and Canadian Standards.

D. The complete packaged pumping system shall be NSF61 / NSF372 Listed for drinking water and low lead requirements.

E. The packaged pump system shall be ASHRAE 90.1 – 2010 compliant without the need of a remote mounted sensor. The control logic used to simulate a remote mounted sensor shall be proportional pressure control with squared or linear adaptation. An actual flow rate or calculated flow rate based on performance curves (5^{th} order polynomial) loaded into the controller; shall be used to adjust setpoint pressure in proportional pressure control.

2.1 PUMPS

A. All pumps shall be ANSI NSF 61 / NSF372 Listed for drinking water and low lead requirements. Pumps shall be certified for drinking water applications and shall contain a NSF nameplate upon completion of manufacturing. Pumps without the 3^{rd} party certification or self certified will not be acceptable.

B. The pumps shall be of the in-line vertical single-stage design.

C. The head-capacity curve shall have a steady rise in head from maximum to minimum flow within the preferred operating region. The shut-off head shall be a minimum of 20% higher than the head at the best efficiency point.

D. Vertical turbine pumps shall have the following features:

1. The pump impellers shall be secured directly to the smooth pump shaft by means of a split cone and nut design.

2. The suction/discharge base shall have ANSI Class 150 flange connections as determined by the pump station manufacturer.

3. Pump Performance

a. The skid mounted pump system will contain five vertical turbine booster pumps. The pumps shall meet or exceed the following performance conditions:

Full Speed Performance Data	Requirements
Number of Pumps	5
Operating Point @ Full Speed, Each Pump	288 gpm @ 95 ft TDH
Total System Flowrate, 4 Pumps	1,150 gpm
Pump Speed, Rated/Maximum/Minimum, rpm	3274/3444/900

Motor Horsepower, HP	20
Voltage, volts/Phase	480/3
Min. Pump Efficiency	65%
Pump Discharge Size	4”
Number of Stages	1
Impeller Diameter, in	Per Manufacterer

b. Pump system shall be Grundfos Hydro MPC-EC (CUE) 5CR 64-1 3x460V 60Hz or approved equal.

4. Pump Construction.

a. Suction/discharge base, pump head	Ductile Iron (ASTM 65-45-12)
b. Shaft couplings, flange rings:	Ductile Iron (ASTM 65-45-12)
b. Shaft	431 Stainless Steel
c. Motor Stool	Cast Iron (ASTM Class 30)
d. Impellers, diffuser chambers, outer sleeve:	304 Stainless Steel
e. Impeller wear rings:	304 Stainless Steel
f. Intermediate Bearing Journals:	Silicon Carbide
g. Intermediate Chamber Bearings:	Leadless Tin Bronze
h. Chamber Bushings:	Graphite Filled PTFE
I. O-rings:	EPDM

5. The shaft seal shall be a balanced o-ring cartridge type with the following features:

a.	Collar, Drivers, Spring:	316 Stainless Steel
b.	Shaft Sleeve, Gland Plate:	316 Stainless Steel
c.	Stationary Ring:	Silicon Carbide
d.	Rotating Ring:	Silicon Carbide
e.	O-rings:	EPDM

The Silicon Carbide shall be imbedded with graphite.

6. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, motor couplings, motor and seal cover. The entire cartridge shaft seal shall be removable as a one piece component. Pumps with motors equal to or larger than 15 hp (fifteen horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.

2.2 SYSTEM CONSTRUCTION

A. Suction and discharge manifold construction shall be in way that ensures minimal pressure drops, minimize potential for corrosion, and prevents bacteria growth at intersection of piping into the manifold. Manifold construction that includes sharp edge transitions or interconnecting piping protruding into manifold is not acceptable. Manifold construction shall be such that water stagnation cannot exist in manifold during operation to prevent bacteria growth inside manifold.

B. The suction and discharge manifolds material shall be 316 stainless steel. Manifold connection sizes shall be as follows:

10 inch and larger: ANSI Class 150 flanges

C. Pump Isolation valves shall be provided on the suction and discharge of each pump. Isolation valve sizes 3 inch and larger shall be a full lug style butterfly valve. The valve disk shall be of stainless steel. The valve seat material shall be EPDM and the body shall be cast iron, coated internally and externally with fusion-bonded epoxy.

D. A spring-loaded non-slam type check valve shall be installed on the discharge of each pump. The valve shall be a wafer style type fitted between two flanges. The head loss through the check valve shall not exceed 5 psi at the pump design capacity. Check valves 1-1/2" and smaller shall have a POM composite body and poppet, a stainless steel spring with EPDM or NBR seats. Check valves 2" and larger shall have a body material of stainless steel or epoxy coated iron (fusion bonded) with an EPDM or NBR resilient seat. Spring material shall be stainless steel. Disk shall be of stainless steel or leadless bronze.

E. A pressure transducer shall be factory installed on the discharge manifold (or field installed as specified on plans). Systems with positive inlet gauge pressure shall have a factory installed pressure transducer on the suction manifold for water shortage protection. Pressure transducers shall be made of 316 stainless steel. Transducer accuracy shall be +/- 1.0% full scale with hysteresis and repeatability of no greater than 0.1% full scale. The output signal shall be 4-20 mA with a supply voltage range of 9-32 VDC.

F. A bourdon tube pressure gauge, 2.5 inch diameter, shall be placed on the suction and discharge manifolds. The gauge shall be liquid filled and have copper alloy internal parts in a stainless steel case. Gauge accuracy shall be 2/1/2 %. The gauge shall be capable of a pressure of 30% above its maximum span without requiring recalibration.

G. Systems with a flooded suction inlet or suction lift configuration shall have a factory installed water shortage protection device on the suction manifold.

H. The base frame shall be constructed of corrosion resistant 304 stainless steel for systems with CR pump sizes up to CR64. The pump system base shall be powder coated white aluminum RAL9006, carbon steel ASTM A36 structural steel, for systems with CR95 and larger pumps.

I. Rubber vibration dampeners shall be fitted between each pumps and base frame to minimize vibration.

2.3 HYDROPNUEMATIC PRESSURE TANK

A. Tank shall be certified to NSF/ANSI 61 for drinking water use.

B. Tank shall be seismically restrained.

C. Designed and constructed per ASME Code Section VIII, Division 1.

D. Tank shall be horizontal with a 400 gallon volume and connections as shown on the project plans.

E. Tank construction shall be ASME approved steel shell.

F. Tank shall have a maximum operating temperature of 240ºF and 150 psig maximum working pressure.

G. ASME Compliance: Fabricate and label products to comply with ASME Boiler and Pressure Vessel Code where required by authorities having jurisdiction.

2.3 AIR CHARGING SYSTEM

A. Pressure and water level in the hydropneumatic pressure tank shall be controlled by an electric air charging system. System shall include an oil-less air compressor, liquid level switch, and pressure switch. Air charging system shall be AIR RITE Model 610 or approved equal.

PART 3 – EXECUTION

3.1 INSTALLATION

A. All mechanical equipment shall be installed in a neat, professional, workmanlike manner, according to manufacturers instructions, applicable standards and these specifications. The finished appearance of installed mechanical equipment shall be first class.

B. **Manuals** CONTRACTOR shall furnish manufacturer's manuals (2 copies) for all installed mechanical equipment. The manuals need not be bound together.

C. **Testing** All pumps will be field tested by DISTRICT in accordance with applicable methods described in AWWA E 101, Appendix A. CONTRACTOR shall adjust or replace equipment not meeting specifications.

* * END OF SECTION * *

Division 15 – Mechanical

SECTION 15100
FIXED LOUVERS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes fixed, extruded-aluminum louvers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

C. Samples: For each type of metal finish required.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on tests performed according to AMCA 500-L.

B. Windborne-debris-impact-resistance test reports.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

2.2 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Drainable-Blade Louver:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Greenheck Fan Corporation.

b. Pottorff.

c. Ruskin Company.

d. United Enertech Corporation.

e. Vent Products Co., Inc.

2. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.

3. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.3 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.

2. Screening Type: Insect and Bird screening.

B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.

C. Louver Screening for Aluminum Louvers:

1. Bird Screening: Aluminum, 1/2-inch-square mesh, 0.063-inch wire.

2.4 MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.

2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.

3. For color-finished louvers, use fasteners with heads that match color of louvers.

2.5 FABRICATION

A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

B. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

D. Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.2 ADJUSTING

A. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

* * END OF SECTION * *

SECTION 15101
CONTROL DAMPERS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes control dampers and actuators for DDC systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 RECTANGULAR CONTROL DAMPERS

A. General Requirements:

1. Unless otherwise indicated, use parallel blade configuration for two-position control, equipment isolation service, and when mixing two airstreams. For other applications, use opposed blade configuration.

B. Rectangular Dampers with Aluminum Airfoil Blades:

1. Requirements in subparagraphs below are based on Ruskin's "CD50 series."

2. Performance:

a. Leakage: AMCA 511, Class 1A. Leakage shall not exceed 3 cfm/sq. ft. against 1- in. wg differential static pressure.

b. Pressure Drop: 0.05-in. wg at 1500 fpm across a 24-by-24-inch damper when tested according to AMCA 500-D, figure 5.3.

c. Velocity: Up to 6000 fpm.

d. Temperature: Minus 40 to plus 185 deg F.

e. Pressure Rating: Damper close-off pressure equal to fan shutoff pressure with a maximum blade deflection of 1/200 of blade length.

f. Damper shall have AMCA seal for both air leakage and air performance.

3. Construction:

a. Frame:

1) Material: 16-Gauge galvanized steel.

2) Channel with integral flange(s). Mating face shall be a minimum of 1 inch.

3) Width not less than 5 inches.

b. Blades:

1) Hollow, airfoil, extruded aluminum.

2) Parallel or opposed blade configuration as required by application.

3) Material: ASTM B211, Alloy 6063 T5 aluminum, 0.07 inch thick.

4) Width not to exceed 6 inches.

5) Length as required by close-off pressure, not to exceed 48 inches.

c. Seals:

1) Blades: Replaceable, mechanically attached extruded silicone, vinyl, or plastic composite.

2) Jambs: Stainless steel, compression type.

d. Axles: 0.5-inch- diameter stainless steel, mechanically attached to blades.

e. Bearings:

1) Molded synthetic or stainless-steel sleeve mounted in frame.

2) Where blade axles are installed in vertical position, provide thrust bearings.

f. Linkage:

1) Concealed in frame.

2) Constructed of aluminum and stainless steel.

3) Hardware: Stainless steel.

g. Transition:

1) Factory mount damper in a sleeve with a close transition to mate to field connection.

2) Damper size and sleeve shall be connection size plus 2 inches.

3) Sleeve length shall be not less than 12 inches for dampers without jackshafts and shall be not less than 16 inches for dampers with jackshafts.

4) Sleeve material shall match adjacent duct.

2.3 GENERAL CONTROL-DAMPER ACTUATOR REQUIREMENTS

A. Actuators shall operate related damper(s) with sufficient reserve power to provide smooth modulating action or two-position action and proper speed of response at velocity and pressure conditions to which the damper is subjected.

B. Actuators shall produce sufficient power and torque to close off against the maximum system pressures encountered. Actuators shall be sized to close off against the fan shutoff pressure as a minimum requirement.

C. The total damper area operated by an actuator shall not exceed 80 percent of manufacturer's maximum area rating.

D. Provide one actuator for each damper assembly where possible. Multiple actuators required to drive a single damper assembly shall operate in unison.

E. Avoid the use of excessively oversized actuators which could overdrive and cause linkage failure when the damper blade has reached either its fully opened or closed position.

F. Use jackshafts and shaft couplings in lieu of blade-to-blade linkages when driving axially aligned damper sections.

G. Provide mounting hardware and linkages for connecting actuator to damper.

H. Select actuators to fail in desired position in the event of a power failure.

I. In "Actuator Fail Positions" Paragraph below, retain second option with any subparagraphs.

J. Actuator Fail Positions: As indicated below:

1. Exhaust Air: Close.

2. Outdoor Air: Close.

2.4 ELECTRIC AND ELECTRONIC ACTUATORS

A. Type: Motor operated, with or without gears, electric and electronic.

B. Manufacturers:

1. Belimo

2. No exceptions.

C. Voltage:

1. Actuator shall deliver torque required for continuous uniform movement of controlled device from limit to limit when operated at rated voltage.

2. Actuator shall function properly within a range of 85 to 120 percent of nameplate voltage.

D. Construction:

1. Less Than 100 W: Fiber or reinforced nylon gears with steel shaft, copper alloy or nylon bearings, and pressed steel enclosures.

2. 100 up to 400 W: Gears ground steel, oil immersed, shaft-hardened steel running in bronze, copper alloy, or ball bearings. Operator and gear trains shall be totally enclosed in dustproof cast-iron, cast-steel, or cast-aluminum housing.

3. Greater Than 400 W: Totally enclosed reversible induction motors with auxiliary hand crank and permanently lubricated bearings.

E. Field Adjustment:

1. Spring return actuators shall be easily switchable from fail open to fail closed in the field without replacement.

2. Provide gear-type actuators with an external manual adjustment mechanism to allow manual positioning of the damper when the actuator is not powered.

F. Two-Position Actuators: Single direction, spring return or reversing type.

G. Fail-Safe:

1. Where indicated, provide actuator to fail to an end position.

2. Internal spring return mechanism to drive controlled device to an end position (open or close) on loss of power.

3. Batteries, capacitors, and other non-mechanical forms of fail-safe operation are acceptable only where uniquely indicated.

H. Integral Overload Protection:

1. Provide against overload throughout the entire operating range in both directions.

2. Electronic overload, digital rotation sensing circuitry, mechanical end switches, or magnetic clutches are acceptable methods of protection.

I. Damper Attachment:

1. Unless otherwise required for damper interface, provide actuator designed to be directly coupled to damper shaft without need for connecting linkages.

2. Attach actuator to damper drive shaft in a way that ensures maximum transfer of power and torque without slippage.

3. Bolt and set screw method of attachment is acceptable only if provided with at least two points of attachment.

J. Temperature and Humidity:

1. Temperature: Suitable for operating temperature range encountered by application with minimum operating temperature range of minus 20 to plus 120 deg F.

2. Humidity: Suitable for humidity range encountered by application; minimum operating range shall be from 5 to 95 percent relative humidity, non-condensing.

K. Enclosure:

1. Suitable for ambient conditions encountered by application.

2. NEMA 250, Type 2 for indoor and protected applications.

3. NEMA 250, Type 4 or Type 4X for outdoor and unprotected applications.

4. Provide actuator enclosure with a heater and controller where required by application.

L. Stroke Time:

1. Operate damper from fully closed to fully open within seconds.

2. Operate damper from fully open to fully closed within seconds.

3. Select operating speed to be compatible with equipment and system operation.

4. Actuators operating in smoke control systems comply with governing code and NFPA requirements.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

A. Furnish and install products required to satisfy most stringent requirements indicated.

B. Properly support dampers and actuators, tubing, wiring, and conduit to comply with requirements indicated. Brace all products to prevent lateral movement and sway or a break in attachment when subjected to a force.

C. Provide ceiling, floor, roof, and wall openings and sleeves required by installation. Before proceeding with drilling, punching, or cutting, check location first for concealed products that could potentially be damaged. Patch, flash, grout, seal, and refinish openings to match adjacent condition.

D. Seal penetrations made in fire-rated and acoustically rated assemblies.

E. Fastening Hardware:

1. Stillson wrenches, pliers, or other tools that will cause injury to or mar surfaces of rods, nuts, and other parts are prohibited for assembling and tightening nuts.

2. Tighten bolts and nuts firmly and uniformly. Do not overstress threads by excessive force or by oversized wrenches.

3. Lubricate threads of bolts, nuts, and screws with graphite and oil before assembly.

F. Install products in locations that are accessible and that will permit calibration and maintenance from floor, equipment platforms, or catwalks. Where ladders are required for DISTRICT's access, confirm unrestricted ladder placement is possible under occupied condition.

3.2 CONTROL DAMPERS

A. Install smooth transitions, not exceeding 15 degrees, to dampers smaller than adjacent duct. Install transitions as close to damper as possible but at distance to avoid interference and impact to performance. Consult manufacturer for recommended clearance.

B. Clearance:

1. Locate dampers for easy access and provide separate support of dampers that cannot be handled by service personnel without hoisting mechanism.

2. Install dampers with at least 24 inches of clear space on sides of dampers requiring service access.

C. Service Access:

1. Dampers and actuators shall be accessible for visual inspection and service.

D. Install dampers straight and true, level in all planes, and square in all dimensions. Install supplementary structural steel reinforcement for large multiple-section dampers if factory support alone cannot handle loading.

E. Attach actuator(s) to damper drive shaft.

F. For duct-mounted and equipment-mounted dampers installed outside of equipment, install a visible and accessible indication of damper position from outside.

3.3 CHECKOUT PROCEDURES

A. Control-Damper Checkout:

1. Check installed products before continuity tests, leak tests, and calibration.

2. Check dampers for proper location and accessibility.

3. Verify that control dampers are installed correctly for flow direction.

4. Verify that proper blade alignment, either parallel or opposed, has been provided.

5. Verify that damper frame attachment is properly secured and sealed.

6. Verify that damper actuator and linkage attachment are secure.

7. Verify that actuator wiring is complete, enclosed, and connected to correct power source.

8. Verify that damper blade travel is unobstructed

3.5 ADJUSTMENT, CALIBRATION, AND TESTING

A. Stroke and adjust control dampers following manufacturer's recommended procedure, from 100 percent open to 100 percent closed back to 100 percent open.

B. Check and document open and close cycle times for applications with a cycle time of less than 30 seconds.

C. For control dampers equipped with positive position indication, check feedback signal at multiple positions to confirm proper position indication.

* * END OF SECTION * *

SECTION 15202
BUTTERFLY VALVES

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide butterfly valves and appurtenances, complete and operable, in accordance with the Contract Documents.

B. The CONTRACTOR is hereby notified that when 12-inch MJ butterfly valves are utilized with PVC pipe, it may be necessary to bevel the interior pipe wall in order to ensure adequate clearance to allow the valve to fully open. For such valves, the CONTRACTOR shall consult with the valve manufacturer to verify whether beveling is required. Such beveling shall be performed utilizing appropriate tools for that purpose.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ASTM A48	Gray Iron Castings
ASTM A126	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A307	Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A395	Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
ASTM A536	Ductile Iron Castings
ASTM B62	Composition Bronze or Ounce Metal Castings
AWWA C115	Flanged Ductile-Iron Pipe with Threaded Flanges
AWWA C504	Rubber Seated Butterfly Valves
AWWA C550	Protective Epoxy Interior Coatings for Valves and Hydrants
AWWA C600	Installation of Ductile Iron Water Mains and Their Appurtenances

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

B. The CONTRACTOR shall submit the following information:

1. Valve type, size, pressure rating and coating system.
2. Complete information on the valve actuator, including size, type and orientation.
3. Assembly drawings showing part nomenclature, materials, dimensions, weights, and relationships of valve actuators.

PART 2 – PRODUCTS

2.1 GENERAL

A. Butterfly valves shall conform to AWWA C504. The valves shall be suitable for a design working water pressure of 250 psig. Butterfly valves shall be of the size and end connections indicated in the Drawings.

2.2 MATERIALS

A. **General:** Materials shall be suitable for the intended application. Materials not indicated shall be high-grade standard commercial quality, free from defects and imperfections that might affect the serviceability of the product for the purpose for which it is intended. Unless otherwise indicated, valve and actuator bodies shall conform to the following requirements:

1. **Cast Iron**: Close-grained gray cast iron, shall conform to ASTM A48, Class 30, or to ASTM A126.

2. **Ductile Iron**: Ductile iron shall conform to ASTM A536 or ASTM A395.

3. **Bronze**: Bronze shall conform to ASTM B62. Bronze shall contain not more than 5 percent of zinc or more than 2 percent of aluminum, with a minimum tensile strength of 30,000 psi, a minimum yield strength of 14,000 psi, and an elongation of at least 10 percent in 2 inches.

2.3 VALVE CONSTRUCTION

A. **Body:** The valve body shall be of cast iron or ductile iron. End connections shall be as indicated in the Drawings. Flanged valves shall be full faced. The CONTRACTOR shall be responsible for coordinating and ensuring that the bolts patterns of flanged butterfly valves are compatible with adjacent pipe and fittings.

B. **Disc:** The disc shall be of cast iron or ductile iron. The disc edge shall be Type 316 stainless steel.

C. **Seat:** The valve seat shall be Buna N, retained in the body.

D. **Shaft:** The shaft shall be of one-piece construction manufactured from stainless steel.

E. **Bearings:** The shaft bearings shall be corrosion-resistant and self-lubricating, made of Teflon or nylon, and designed to last the life of the valve without replacement.

F. **Packing:** The shaft packing shall be chevron-V type, fully adjustable and field-replaceable.

G. **Actuators**: Butterfly valves shall be equipped with traveling-nut actuators, lubricated and sealed to prevent entry of dirt or water into the housing.

H. **Flange Gaskets:** Gaskets for flanged joints shall be full-faced, 1/8-inch thick synthetic rubber conforming with AWWA C115. Gaskets shall be rated for long-term exterior above grade installation by the manufacturer.

I. **Nuts and Bolts:** Nuts and bolts for flanged and mechanical joints shall conform to the requirements given for nuts and bolts in Section 02565 – Ductile Iron Pipe.

J. **Factory Testing:** Butterfly valves shall be factory tested by the manufacturer to ensure a watertight seal in both directions.

2.4 PROTECTIVE COATING

A. The exterior surfaces and the wet interior surfaces of all butterfly valves shall be coated with polyamide-cured epoxy. High build, polyamide epoxy resin shall have a solids content of at least 56 percent by volume, and shall be suitable for long-term immersion in potable water and municipal wastewater. The coating material shall be listed by the NSF International as in compliance with NSF Standard 61 and shall comply with AWWA C550.

2.5 VALVE BOXES

A. Valve boxes shall be precast concrete with a cast-iron lid. Valve boxes shall be cylindrical and shall have an inside diameter of 10-3/8” inches or larger. Covers of valve boxes shall be permanently labeled as “WATER”. Valve boxes shall be **Christy Model G5,** or approved equal.

B. If grade rings are required to properly install the valve box to grade, locking grade rings shall be used. Grade rings shall be manufactured by the same company as the valve box itself.

C. Risers shall be fabricated from a single piece of SDR-35 PVC pipe with a nominal diameter of 6-inches. Riser caps shall be Model No. 304-206 by Taylor Made Plastics. No substitutes or equals will be accepted.

D. For valves where the operating nut is more than 3.5 feet below finished grade, the CONTRACTOR shall install a valve nut extension. The length of the valve nut extension and Model Number shall be based upon Table 15202-1. Valve nut extensions shall be Placer Waterworks Model PW/VS with 5.5” ring, or approved equal.

2.6 VALVE MARKING STAKES

A. Valve marking stakes shall be shall be “Utility Marker” model by Carsonite International. Marking stakes shall be blue in color with a white decal that reads “Water Valve” affixed to one side one. Marking stakes shall be product number CRM306208. The decal shall be product number 1703 WV.

2.7 MANUFACTURERS

A. Butterfly valves shall be Mueller Lineseal XP series, Pratt Groundhog Series or approved equal.

PART 3 – EXECUTION

3.1 GENERAL

A. Valves, actuating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the Manufacturer's written instructions. Valves shall be laid in sequence with adjacent pipe and fittings.

B. Valves shall be firmly supported on compacted Type B material avoid undue stresses on the pipe.

3.2 VALVE BOXES

A. All buried valves shall be furnished with a valve box and riser. The box and riser shall be centered over the valve operating nut and shall be perpendicular to the valve centerline. The box and riser shall be placed as to not transmit any shock or stress to the valve or adjacent pipe.

B. Valve boxes shall be placed such that the cover is ½-inch below the finished grade in paved areas and 1-inch above finished grade in unpaved areas.

C. For valve boxes located within unpaved areas, the CONTRACTOR shall install a valve marking stake adjacent to the valve box.

Table 15202-1. Valve Nut Extensions

Depth to Nut from Finished Grade	Length of Valve Extension	Placer Water Works Model #
42	18	PW / VE / 18" with 5.5" ring
43	18	PW / VE / 18" with 5.5" ring
44	18	PW / VE / 18" with 5.5" ring
45	18	PW / VE / 18" with 5.5" ring
46	24	PW / VE / 24" with 5.5" ring
47	24	PW / VE / 24" with 5.5" ring
48	24	PW / VE / 24" with 5.5" ring
49	24	PW / VE / 24" with 5.5" ring
50	24	PW / VE / 24" with 5.5" ring
51	24	PW / VE / 24" with 5.5" ring
52	24	PW / VE / 24" with 5.5" ring
53	24	PW / VE / 24" with 5.5" ring
54	24	PW / VE / 24" with 5.5" ring
55	24	PW / VE / 24" with 5.5" ring
56	24	PW / VE / 24" with 5.5" ring
57	24	PW / VE / 24" with 5.5" ring
58	36	PW / VE / 36" with 5.5" ring
59	36	PW / VE / 36" with 5.5" ring
60	36	PW / VE / 36" with 5.5" ring
61	36	PW / VE / 36" with 5.5" ring
62	36	PW / VE / 36" with 5.5" ring
63	36	PW / VE / 36" with 5.5" ring
64	36	PW / VE / 36" with 5.5" ring
65	36	PW / VE / 36" with 5.5" ring
66	36	PW / VE / 36" with 5.5" ring
67	36	PW / VE / 36" with 5.5" ring
68	36	PW / VE / 36" with 5.5" ring
69	48	PW / VE / 48" with 5.5" ring
70	48	PW / VE / 48" with 5.5" ring

71	48	PW / VE / 48" with 5.5" ring
72	48	PW / VE / 48" with 5.5" ring

* * END OF SECTION * *

SECTION 15206
GATE VALVES

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide resilient-wedge gate valves and appurtenances, complete and operable, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ASTM A48	Gray Iron Castings
ASTM A126	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A307	Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A395	Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
ASTM A536	Ductile Iron Castings
ASTM B62	Composition Bronze or Ounce Metal Castings
ASTM B584	Copper Alloy Sand Castings for General Applications
AWWA C509	Resilient-Seated Gate Valves for Water Supply Service
AWWA C515	Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
AWWA C550	Protective Epoxy Interior Coatings for Valves and Hydrants
AWWA C600	Installation of Ductile Iron Water Mains and Their Appurtenances

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall furnish submittals in accordance with Section 01300 – Contractor Submittals.

B. The CONTRACTOR shall submit the following information:

1. Valve type, size, pressure rating and actuator type.

2. Assembly drawings showing part nomenclature, materials, dimensions, weights, and relationships of valve actuators.

PART 2 – PRODUCTS

2.1 GENERAL

A. **Construction:** Gate valves shall be of the resilient-wedge type, with an inside screw, non-rising stem conforming to either AWWA C509 or C515. The valves shall be suitable for a design working water pressure of 250 psig. The valve body, bonnet, and disc shall be of cast iron or ductile iron and the disc or body shall be rubber-coated. For valves conforming to C509, the body and bonnet wall thickness shall be equal to or greater than the minimum wall thickness as listed in Table 2 of AWWA C509. For valves conforming to C515, the body and bonnet wall thickness shall be equal to or greater than the minimum wall thickness as listed in Table 1 of AWWA C515. The stem, stem nuts, glands, and bushings shall be of bronze, with O-ring seals.

B. **Actuators:** Gate valves shall have 2-inch square operating nuts, turning counterclockwise to open.

C. **Buried Valves**: Buried valves shall have concrete valve boxes as indicated in Article 2.5.A. Operating nuts shall comply with AWWA C509.

2.2 MATERIALS

A. **General:** Materials shall be suitable for the intended application. Materials not indicated shall be high-grade standard commercial quality, free from defects and imperfections that might affect the serviceability of the product for the purpose for which it is intended. Unless otherwise indicated, valve and actuator bodies shall conform to the following requirements:

1. **General:** Materials shall be suitable for the intended application. Materials not indicated shall be high-grade standard commercial quality, free from defects and imperfections that might affect the serviceability of the product for the purpose for which it is intended. Unless otherwise indicated, valve and actuator bodies shall conform to the following requirements:

1. **Cast Iron**: Close-grained gray cast iron, conforming to ASTM A48, Class 30, or to ASTM A126.

2. **Ductile Iron**: Ductile conforming to ASTM A536 or to ASTM A395.

3. **Bronze**: Bronze conforming to ASTM B62.

2.3 VALVE CONSTRUCTION

A. **Bodies:** Valve bodies shall be of cast or ductile iron, with smooth interior passages. Wall thicknesses shall be uniform, in agreement with the applicable standards for each type of valve and without casting defects, pinholes, or other defects that could weaken the body. Valve ends shall be as indicated in the Drawings.

B. **Bonnets:** Valve bonnets shall be clamped, screwed, or flanged to the body and shall be of the same material, temperature, and pressure rating as the body. The bonnets shall have provision for the stem seal with the necessary glands, packing nuts, or yokes.

C. **Stems:** Valve stems shall be of bronze with O-ring seals.

D. **Internal Parts:** Internal parts and valve trim shall be bronze.

E. **Nuts and Bolts:** Nuts and bolts for flanged and mechanical joints shall conform to the requirements for nuts and bolts in Section 02565 – Ductile Iron Pipe.

2.4 PROTECTIVE COATING

A. The exterior surfaces and the wet interior surfaces of all gate valves shall be coated with polyamide-cured epoxy. High build, polyamide epoxy resin shall have a solids content of at least 56 percent by volume, and shall be suitable for long-term immersion in potable water and municipal wastewater. The coating material shall be listed by the NSF International as in compliance with NSF Standard 61 and shall comply with AWWA C550.

2.5 VALVE BOXES

A. Valve boxes shall be precast concrete with a cast-iron lid. Valve boxes shall be cylindrical and shall have an inside diameter of 10-3/8” inches or larger. Covers of valve boxes shall be permanently labeled as “WATER”. Valve boxes shall be **Christy Model G5,** or approved equal.

B. If grade rings are required to properly install the valve box to grade, locking grade rings shall be used. Grade rings shall be manufactured by the same company as the valve box itself.

C. Risers shall be fabricated from a single piece of SDR-35 PVC pipe with a nominal diameter of 6-inches. Riser caps shall be Model No. 304-206 by Taylor Made Plastics. No substitutes or equals will be accepted. For all gate valves by Mueller and all other 10-inch and 12-inch gate valves, the CONTRACTOR shall install an 8” x 6” concentric reducer on the bottom of the riser.

D. For valves where the operating nut is more than 3.5 feet below finished grade, the CONTRACTOR shall install a valve nut extension. The length of the valve nut extension and Model Number shall be based upon Table 15202-1. Valve nut extensions shall be Placer Waterworks Model PW/VS with 5.5” ring, or approved equal.

2.6 VALVE MARKING STAKES

A. Valve marking stakes shall be shall be “Utility Marker” model by Carsonite International. Marking stakes shall be blue in color with a white decal that reads “Water Valve” affixed to one side one. Marking stakes shall be product number CRM306208. The decal shall be product number 1703 WV.

2.7 MANUFACTURERS

A. Gate valves shall be Mueller 2360 Series, Mueller 2361 Series, or American Flow Control 2500 series. No equals or substitutes will be allowed.

PART 3 – EXECUTION

3.1 GENERAL

A. Valves, actuating units, stem extensions, valve boxes, and accessories shall be installed in accordance with the Manufacturer's written instructions, AWWA C600 and these specifications. Valves shall be laid in sequence with adjacent pipe and fittings.

B. Valves shall be firmly supported on a bed of compacted Type B material to avoid undue stresses on the pipe. Concrete shall not be placed around bells, flanges, couplings, nuts, or bolts.

3.2 VALVE BOXES

A. All buried valves shall be furnished with a valve box. The box and riser shall be centered over the valve operating nut and shall be perpendicular to the valve centerline. The box and riser shall be placed as to not transmit any shock or stress to the valve or adjacent pipe.

B. Valve boxes shall be placed such that the cover is ½-inch below the finished grade in paved areas and 1-inch above finished grade in unpaved areas.

C. For valve boxes located within unpaved areas, the CONTRACTOR shall install a valve marking stake adjacent to the valve box.

Table 15206-1. Valve Nut Extensions

Depth to Nut from Finished Grade	Length of Valve Extension	Placer Water Works Model #
42	18	PW / VE / 18" with 5.5" ring
43	18	PW / VE / 18" with 5.5" ring
44	18	PW / VE / 18" with 5.5" ring
45	18	PW / VE / 18" with 5.5" ring
46	24	PW / VE / 24" with 5.5" ring
47	24	PW / VE / 24" with 5.5" ring
48	24	PW / VE / 24" with 5.5" ring
49	24	PW / VE / 24" with 5.5" ring
50	24	PW / VE / 24" with 5.5" ring
51	24	PW / VE / 24" with 5.5" ring
52	24	PW / VE / 24" with 5.5" ring
53	24	PW / VE / 24" with 5.5" ring
54	24	PW / VE / 24" with 5.5" ring
55	24	PW / VE / 24" with 5.5" ring
56	24	PW / VE / 24" with 5.5" ring
57	24	PW / VE / 24" with 5.5" ring
58	36	PW / VE / 36" with 5.5" ring
59	36	PW / VE / 36" with 5.5" ring
60	36	PW / VE / 36" with 5.5" ring
61	36	PW / VE / 36" with 5.5" ring
62	36	PW / VE / 36" with 5.5" ring
63	36	PW / VE / 36" with 5.5" ring
64	36	PW / VE / 36" with 5.5" ring
65	36	PW / VE / 36" with 5.5" ring

66	36	PW / VE / 36" with 5.5" ring
67	36	PW / VE / 36" with 5.5" ring
68	36	PW / VE / 36" with 5.5" ring
69	48	PW / VE / 48" with 5.5" ring
70	48	PW / VE / 48" with 5.5" ring
71	48	PW / VE / 48" with 5.5" ring
72	48	PW / VE / 48" with 5.5" ring

* * END OF SECTION * *

SECTION 15232
AIR RELEASE ASSEMBLIES

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall provide air valve assemblies, complete and operable, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

ASTM B43	Seamless Red Brass Pipe, Standard Sizes
ANSI B1.20	National Pipe Tapered (NPT) standard for Tapered Threads
ANSI B16.15	Cast Bronze Threaded Fittings
AWWA C800	Underground Service Line Valves

PART 2 – PRODUCTS

2.1 COMBINATION AIR VALVES

A. Combination air valves shall be capable of exhausting accumulated air in systems under pressure and releasing or re-admitting large quantities of air while a system is being filled or drained, respectively. Valves shall be of the size indicated, with flanged or screwed ends to match piping. Bodies shall be of high-strength cast iron. The float, seat, and all moving parts shall be constructed of Type 316 stainless steel. Seat washers and gaskets shall be of a material insuring water tightness with a minimum of maintenance. Valves shall be designed for a minimum working pressure of 20 psi and a maximum working pressure of 300 psi. Air valves shall be Crispin model UL-10 or Cla-Val model 361-CAV564.3.

2.2 RED BRASS PIPE

A. Red brass pipe shall conform to the requirements of ASTM B43 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Red brass pipe shall have threaded ends for NPT fittings.

B. Fittings for red brass pipe shall be Class 250 threaded cast bronze in accordance with ANSI B16.15 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Fittings shall be designed for working pressures of 250 psi. Threads shall be NPT in compliance with ANSI B1.20. Threaded joints shall be made up with teflon tape.

2.3 CORPORATION STOP VALVES

A. Corporation stop valves shall conform to the requirements of Section 02641 – Water Service Connections except that the end connections shall be male iron pipe thread by male iron pipe thread.

2.4 STOP AND WASTE BALL VALVES

A. Stop and waste ball valves shall conform to AWWA C800. The valve body shall be of an alloy conforming to AWWA C800 and shall be “lead-free” in accordance with Section 116875 of the California Health and Safety Code. Stop and waste ball valves shall be designed for working pressures of 175 psi. End connections shall be female iron pipe thread by female iron pipe thread. Stop and waste ball valves for air valve assemblies shall be Ford Model B11-666SW-QT67-NL. No equals or substitutes will be accepted.

2.5 CORPORATION STOP VALVES

A. Corporation stop valves shall conform to the requirements of Section 02641 – Water Service Connections except that the end connections shall be male iron pipe thread by male iron pipe thread.

PART 3 – EXECUTION

3.1 GENERAL

A. Air valve assembly piping shall be tested in accordance with Section 02643 – Water Pipeline Testing and Disinfection.

* * END OF SECTION * *

SECTION 15235
FIRE HYDRANTS

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall furnish and install dry-barrel fire hydrants including all appurtenances and accessories, complete and operable, in accordance with the requirements of the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

AWWA C502	Dry-Barrel Fire Hydrants
TT-C-494B	Federal Specifications for Coating Compound, Bituminous, Solvent Type Acid Resistant

PART 2 – PRODUCTS

2.1 FIRE HYDRANTS

A. **Construction:** Fire hydrants shall be of the dry-barrel type according to AWWA C502. Fire hydrants shall have one 4-1/2” and two 2-1/2” national standard thread hose connections. All hose connections shall be provided with ductile iron nozzle caps with metal chains. Nozzle cap nuts shall be same shape and size as operating nuts. The stem shall have a break-away coupling. The upper standpipe shall be 28” in height. The bottom base connection shall be either 6” flanged or 6” mechanical joint. The barrel shall have a “breakable” flanged connection to connect the upper and lower standpipe sections. Both standpipe sections shall be manufactured of ductile iron. Hydrant operating threads shall be lubricated with food machinery grade grease conforming to the requirements of US 21 CFR 178.3570.

B. **Operating Nuts:** Operating nuts shall be 1-1/2” pentagons. The operating nut shall rotate counter-clockwise to open. Operating nuts shall be equipped with weathershields.

C. **Pressure Rating:** Fire hydrants shall be tested to 500 psig and shall be suitable for a continuous working pressure of 250 psig.

2.2 COATINGS

A. **Exterior Coating of Upper Standpipe:** The exterior surfaces of the upper standpipe shall have a three coat paint system conforming to the requirements of AWWA C502. The paint system shall consist of one primer coat and two finish coats. Color of the finished coats shall be “Hydrant Red.”

B. **Exterior Coating of Lower Standpipe:** The exterior surfaces of the lower standpipe shall have an asphaltic coating approximately 1 mil thick.

C. **Interior Coating:** The interior surfaces of the fire hydrant shall be coating with black asphalt paint conforming to Federal Specification TT-C-494B.

2.3 MANUFACTURERS

A. Fire hydrants shall be Waterous Pacer Model No. WB67DDP. No equals or substitutes will be accepted.

2.4 LOCATOR WIRE AND MARKING TAPE

A. Fire hydrant laterals shall be furnished with locator wire as indicated in Section 02565 – Ductile Iron Pipe. The locator wire shall terminate in a 2” plastic riser. The riser shall be 2” schedule 40 PVC pipe and shall be furnished with a slip x FIP adapter and a 2” threaded plug.

B. Fire hydrant laterals shall be furnished with marking tape as indicated in Section 02565 – Ductile Iron Pipe.

2.5 BARRIER POSTS

A. Barrier posts shall be made from pieces of 6-inch diameter steel pipe. Barrier posts shall be painted ***Safety Yellow*** with an exterior rated water based paint.

B. Concrete for barrier posts shall confirm to the requirements given for thrust blocks in Section 02565 – Ductile Iron Pipe.

2.6 FILTER FABRIC

A. Filter fabric shall conform to the requirements for underdrains given in Section 88-1.03 of the Standard Specifications.

2.7 FIRE HYDRANT MARKER STAKES

A. Fire hydrant marker stakes shall be a minimum of 54” tall and fabricated from 3/8” diameter, grade 304 stainless steel.

B. Marker stakes shall have an offset loop. The inside diameter of the loop shall be approximately 3.5” and the loop shall be intended for installation on the 2.5” outlet of the fire hydrant. A flexible clear sleeve shall be installed on the loop portion of the stake.

C. Marker stakes shall have color banding win the following sequence: Red-Fluorescent Yellow-Red-Fluorescent Yellow.

D. Marker stakes shall be manufactured shall by Hy-Viz, or approved equal.

PART 3 – EXECUTION

3.1 INSTALLATION

A. All fire hydrants shall be installed in strict accordance with the manufacturer's published recommendations, AWWA Standards, and all applicable codes.

B. Fire hydrant laterals shall be installed as indicated in the Drawings. All joints along the hydrant lateral shall be fully restrained using mechanical methods of joint restraint. Concrete thrust blocks shall not be placed behind fire hydrants.

C. At the time of installation, the CONTRACTOR shall turn the operating nut to ensure that the fire hydrant foot valve is fully closed.

3.2 FIRE HYDRANT LOCATION

A. Where practicable, fire hydrants shall be installed a minimum distance of six feet behind the edge of pavement or two feet behind the asphalt cement dike, if an asphalt cement dike is present.

3.3 PROTECTION OF HYDRANTS DURING CONSTRUCTION

A. Immediately after installation, a heavy duty 30 gallon garbage bag shall be placed over the fire hydrant as a protective cover during the construction period. The bottom of the bag shall be secured with duct tape to prevent the bag from being dislodged by heavy winds. The bag shall remain in place until the DISTRICT authorizes its removal.

* * END OF SECTION * *

SECTION 15880
UNIT HEATERS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes wall and ceiling heaters with propeller fans and electric-resistance heating coils.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1. Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Operation and maintenance data.

PART 2 – PRODUCTS

2.1 WALL AND CEILING UNIT HEATERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Berko

2. QMARK

3. Chromalox

B. Description: wall and ceiling heaters with propeller fans and electric-resistance heating coils. Heater shall be minimum 20 kW.

C. Assembly including chassis, electric heating coil, fan, motor, and controls. Comply with UL 2021.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Housing: Die-formed Steel

F. Electric-Resistance Heating Coil: Aluminum-finned, copper clad steel sheath heating element, free from expansion noise and 60-Hz hum.

G. Electrical Requirements: NEMA 6-30P plug and cord for electrical to wall receptacle.

H. Provide with thermostat.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install heaters level and plumb.

B. Wall Units: Secure units to wall.

C. Install units with clearances for service and maintenance.

D. Install ducts adjacent to heaters to allow service and maintenance.

3.2 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Verify that shipping, blocking, and bracing are removed.

2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

3. Verify that cleaning and adjusting are complete.

4. Verify lubrication for bearings and other moving parts.

5. Energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.

6. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

* * END OF SECTION * *

DIVISION 16 - ELECTRICAL

SECTION 16010

GENERAL REQUIREMENTS, ELECTRICAL

PART 1 GENERAL

1.1 SCOPE OF WORK

A. All general provisions of the Contract Documents apply to all work specified in this Division 16 Electrical.

B. Furnish all necessary labor, materials, equipment and incidentals required to install a complete and operational electrical system according to the intent of this specification and the accompanying drawings, whether itemized or not.

C. Examine the specification and drawings for mechanical equipment and provide all starters, 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.

1. Where mechanical and process equipment is provided with specialty protective relays, the relays shall be incorporated into the controls at no additional cost to the DISTRICT.
2. The DISTRICT is providing equipment for the CONTRACTOR to install.
3. Substantial equipment is expected to be supplied with the skid mounted pumps (i.e. the Pump Control Panel). Coordinate scopes with the skid manufacturer and provide all conduit and conductors that could be expected to be provided with the pump packages but is not included in the skid manufacturer's scope.

D. The general extent of the electrical work includes, among others, the furnishing and installing of the following items:

1. Utility equipment (Meter/Main) enclosures.

2. Panelboards and transformer.

3. Unit heater contactors.

4. Automatic transfer switch.

5. Standby Diesel Engine Generator (Relocate Existing Generator).

6. Lighting, accessories, controls and receptacles.

7. Instrumentation.

8. Conduit, Fittings and Conductors.

9. Complete circuiting and connections for all motors, including their remote control and indicating devices.

10. All supports, bases, anchors, sleeves, hangers, conduit seals, and the like, all electrical work shown and/or specified, not particularly mentioned above.

11. Complete grounding system.

12. Significant documentation, including submittal, instruction, operations and maintenance manuals.

13. Very significant field services including pre-start-up check-out, testing, calibration, start-up, communications testing and training.

14. Power, control, alarm, and instrumentation wiring for all equipment specified in Divisions 11, 15, 16 and 17.

E. Additionally, there is a control panel and communication enclosure to be provided and install by the CONTRACTOR with some internal components mounted/install by the DISTRICT requiring significant coordination on the CONTRACTOR'S part.

F. Throughout this Contract, provide protection for materials and equipment against loss or damage in accordance with provisions elsewhere in these Contract Documents. Throughout this Contract, follow manufacturer's recommendations for storage. Protect everything from the effects of weather. Prior to installation, store items in clean, dry, indoor locations. Store in clean, dry, indoor, heated locations items subject to corrosion under damp conditions, and items containing electrical insulation, such as transformers, conductors, motors, and controls. Energize all space heaters furnished with equipment. Provide temporary heating, sufficient to prevent condensation, in transformers, pedestals, switchgear, switchboards, motors, and motor controls, which do not bare space heaters.

G. Following installation, protect materials and equipment from corrosion, physical damage, and the effects of moisture on insulation. When equipment intended for indoor installation is installed at the CONTRACTOR's convenience in areas where it is subject to dampness, moisture, dirt, or other adverse atmosphere until completion of construction; ensure that adequate protection from these atmospheres is provided that is acceptable to the DISTRICT. Cap conduit runs during construction. Energize all space heaters furnished with equipment.

H. All temporary wiring for the motors and equipment shall have disconnect means, overcurrent protection, and conduit or metal wireways as required by the National Electrical Code, except that jacketed flexible cables may be exposed on equipment.

I. Provide an experienced field supervisor to monitor work progress and to attend regular project meetings. Reference the General Conditions for specific requirements.

J. The work includes significant documentation, start-up services and training. Review the specific requirements throughout Division 16 with due diligence.

1.2 CODES AND STANDARDS

A. All Work shall conform to the following codes:

1. National Electrical Code –2023 Edition

2. NFPA 70E – Electrical Safety

3. NFPA 101 - Life Safety Code - Latest Edition

4. Uniform Building Code - Latest Edition

5. Local Electrical Code

6. NETA Standards for Testing

7. Any additional codes effective at the job site

B. The Contractor shall furnish without extra charge any additional material and labor which may be required for compliance with these laws, rules, and regulations, even though the work is not mentioned in these particular specifications or shown on the drawings.

C. The Contractor shall apply and pay for all permits required by any of the legally constituted public authorities for the installation or construction of the work included under this Division. The Contractor shall arrange and pay for any inspections or examinations so required and deliver certificates of all such inspections to the DISTRICT. When these specifications call for materials or construction of a better quality or larger sizes than required by the above mentioned rules and regulations, the provisions of the specifications shall take precedence.

1.3 ARC FLASH ANALYSIS AND SIGNAGE

A. Provide an arc flash hazard analysis. The arc flash analysis shall be based on based on calculations performed per 1584a standards published by the IEEE 1584 working group. The worst case Incident Energy released shall be determined and boundaries shall be marked for Arc Flash Protection. Markings and hazard signage and labels shall conform to OSHA 29 CFR 1910 132(d) and other applicable requirements. Working distances, required PPE Level, shock hazard voltage and limited, restricted and prohibited approach distances shall be posted. The arc flash hazard analysis shall utilize results from a short circuit study and from a protective device co-ordination study. All study results shall be presented in a bound report with all assumptions, methodology, equipment lists with component ratings, electrical one-lines used, calculations and resulting requirements.

B. Submit a short circuit study adequate to support the arc flash hazard analysis and the coordination study.

C. Submit protective device coordination study with recommended coordinated settings for adjustable breakers with a check list for confirming implementation.

D. Submit a harmonic analysis and if the results exceed industry standards recommend an active harmonic filter.

D. Submit label layouts for review by DISTRICT prior to affixing to the equipment.

1.4 QUALITY OF MATERIALS

A. All electrical materials used on this project shall be new and free from defects.

B. All electrical materials used on this project shall conform where applicable, to the following standards, unless otherwise noted:

1. NEMA - National Electrical Manufacturers Association

2. ANSI - American National Standards Institute

3. UL - Underwriters Laboratories, Inc.

C. Each type of material shall be of the same manufacturer and quality throughout the work.

1.5 SUBSTITUTIONS

A. Specific brand names and catalog numbers are used to describe materials in order to establish standards of performance and quality or to match existing equipment. Refer to Section 01600 regarding the procedure for submitting substitutions.

B. The decision of the DISTRICT shall govern as to what is equal to the item specified. Equality will be judged on the basis of the following:

1. Conformance with description or performance required.

2. Equal in quality.

2. Comparable in appearance and artistic effect where these are considerations.

4. Comparable operation, maintenance and performance.

5. Equal in longevity and service under conditions of climate and usage.

6. Conformance with space allocations and requirements for operations from mechanical or electrical services provided without necessitating changes in details and construction or related work.

7. Compatible with existing equipment.

C. If the DISTRICT considers it necessary, tests to determine the quality of the proposed materials shall be made, at the expense of the CONTRACTOR, by an unbiased laboratory, satisfactory to the DISTRICT.

D. Any material, article, or method judged by the DISTRICT equal to that specified will be approved, provided the CONTRACTOR submits a single written request, in triplicate, to the DISTRICT, within 45 days after contract award, with the following information for each item:

1. Name of manufacturer or supplier.

2. Trade or brand name.

3. Type, model, style, and/or catalog number.

4. Size or capacity rating.

E. The CONTRACTOR assumes full responsibility for including complete, correct data in this one request and shall also attach completely referenced diagrams descriptive and technical data sheets for the DISTRICT's determination of equality or suitability of appearance of any substitution item. Only one such request may be submitted. The DISTRICT's rejection of any substitute shall automatically require the CONTRACTOR to furnish the specified item without further discussion or delay.

1.6 MATERIAL, EQUIPMENT AND SHOP DRAWING SUBMITTALS

A. Submittals shall be prepared in accordance with General Conditions, Section 01300.

B. The following information shall be clearly marked on each shop drawing, catalog data sheet, specification sheet, etc. submitted:

1. Project Title.

2. Date.

3. Submitted By.

4. Identification of item represented.

C. Shop drawings shall be drawn to scale or completely dimensioned and shall give all information required to completely describe the item. Shop drawings of speed control switchboards, panels, and motor control centers shall all be submitted on 11" x 17" or 24" x 36" size sheets at one time. 8-1/2" x 11" sheets will not be accepted. Drawings shall show front views, plan views, elementary wiring diagrams and numbered terminal blocks. Drawings shall be submitted for existing equipment requiring modifications as called for on drawings.

D. The CONTRACTOR shall carefully check all his shop drawings for compliance with this Specification and the Plans.

E. In the event that certain shop drawings are rejected by the DISTRICT, they will be so noted and returned to the CONTRACTOR for resubmittal. Resubmittals are to be made within 14 days.

F. If the shop drawings show variation from the contract requirements because of standard shop practice or other reasons, the CONTRACTOR shall make specific mention of such variations in order that if acceptable, suitable action may be taken for proper adjustment of the Contract. The CONTRACTOR will not be relieved of the responsibility for executing the work in accordance with the Contract, even though the shop drawings have been reviewed.

G. The DISTRICT's review of shop drawings will be for general design and arrangement only, and shall not relieve the CONTRACTOR from responsibility for errors of any sort in shop drawings or schedules. The CONTRACTOR shall verify all dimensions and job site conditions affecting the work, and shall be responsible for furnishing and installing the proper materials required by the Contract, whether or not indicated on the shop drawings.

H. Work requiring shop drawings shall not be started before receipt of the DISTRICT's written approval.

I. Provide complete interconnection wiring diagrams. Interconnections drawings shall show for each piece of equipment and all wiring between all devices, panels, cabinets, terminal boxes, control equipment, motor control centers and any other devices and equipment including equipment provided in other Divisions of the Specifications as well as equipment provided by the DISTRICT. Each interconnection diagram shall show the following as a minimum: each conduit number, wire label, wire color code and terminal number, as actually installed; each motor, starter, cubicle, disconnect, switch, panel, cabinet, instrument, device, and all other equipment; and grounding points.

J. Commercial Warranties: Pursuant to the General Provision of the contract, prior to final payment, the Contractor shall furnish to the DISTRICT a listing of all manufacturers of their materials and equipment. The list of these warranties must include the time period of each warranty, i.e. 6 months, 1 year, and the like. One copy each of those warranties whose time period exceeds 1 year shall be submitted with the listing.

K. Submit seismic calculations for the anchor systems for each item specified herein which weighs in excess of 400 pounds (wet, or operating weight). Calculations shall include seismic horizontal and vertical forces as well as dead load or live load calculations, as applicable. Calculations shall include details, which show size and material of anchor bolts, spacing requirements, grout and filler specifications, strap material, spacing and fastening requirements, and any miscellaneous information required to properly secure the item of equipment. Calculations shall be stamped by a Structural Engineer registered in the State of California.

L. Submit a single complete package for all products on the following list:

1. Conduit, fittings, supports, conductors, vaults and boxes.

2. Light fixtures, contactors, disconnects, receptacles and switches.

3. Utility equipment (Meter/Main) enclosure.

4. Panelboards and transformer.

5. Automatic transfer switch.

6. Instrumentation.

7. Seismic Calculations and anchor recommendations.

8. Arc Flash Analysis and Signage with short circuit study, protective device coordination study and circuit breaker settings for switchboard, each MCC section, panelboard and the control panel.

1.7 OPERATION AND MAINTENANCE MANUALS:

A. The CONTRACTOR shall provide an Operation and Maintenance manual in pdf file format on athumbdrive or other method acceptable to the District prior to completion of the Work. The manuals shall be in 8-1/2" x 11" and 11" x 17" format. Provide a table of contents and one section for each item of equipment specified herein.

B. For each section provide the following information, as applicable:

1. An itemized list of all data provided.

2. Name and location of the manufacturer, the manufacturer's local representative, the nearest suppliers, and spare parts warehouse.

3. Recommended installation, adjustment, start up, calibration, and troubleshooting procedures.

4. Recommended lubrication, lubrication intervals, and an estimate of yearly quantity needed.

5. Recommended step-by-step procedures for all modes of operation.

6. Complete internal and connection wiring diagrams.

7. Recommended preventive maintenance procedures and schedule.

8. Complete parts lists, by generic title and identification number, with exploded views of each assembly.

9. Recommended spare parts and special tools.

10. Disassembly, overhaul, and reassembly instructions.

11. All approved shop drawing information pertinent to facility operation and maintenance.

12. Equipment calibration data, calibration sheets including equipment/instrument description.

13. Approved submittal information.

15. Controller program with notes and operation description with setpoint table.

16. Include in the manual any information provided by the DISTRICT for DISTRICT provided equipment.

17. Record (as-built) submittal information covering all CONTRACTOR supplied equipment.

D. As-built drawings, containing complete wiring diagrams, shall be submitted with the Operation and Maintenance manuals described above.

E. As built [Contract Document] Drawings shall be marked with red pencil to show electrical work revisions and actual routes of embedded or buried conduit, which may differ from the Drawings. Refer to the General Conditions for additional requirements.

F. Test results/reports shall be contained within the Operation & Maintenance manual and shall be placed under each respective equipment item tested.

1.8 AS BUILT RECORD DRAWINGS

A. The CONTRACTOR shall keep an accurate legible record of all changes and conduit relocations made during construction and shall make up a separate legible record copy of Contract Drawings at completion of the project. A working copy of as-built drawings shall be maintained on site at all times during construction.

1.9 INTERPRETATION OF DRAWINGS

A. Any error or omissions of detail in either the drawings or the specifications shall not relieve the CONTRACTOR from correctly installing all materials necessary for complete and operating electrical system.

B. The CONTRACTOR shall inspect the site and 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.

C. The electrical drawings are diagrammatic, but shall be followed as closely as existing conditions and work of other contractors will permit. All deviations from the drawings required to make the work conform to structures as constructed, and to the work of others, shall be made at the CONTRACTOR's expense.

D. The CONTRACTOR shall examine the civil, structural, mechanical, architectural and manufacturer's drawings for the various equipment in order to determine exact routing and final terminations for all conduits and cables. Conduits shall be stubbed up as near as possible to equipment enclosure.

1.10 LOCATIONS AND ENCLOSURES

A. Provide equipment, materials, and wiring methods suitable for the type of locations in which they are located.

B. Definitions of types of locations and types of enclosures to be provided:

1. Dry locations: All indoor areas that do not fall within the definitions below for wet, damp, hazardous, nor corrosive locations and which are not otherwise designated on the drawings. Provide NEMA 1A or NEMA 12 enclosures.

2. Wet locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the drawings. Provide NEMA 3R enclosures.

3. Damp locations: All indoor [or outdoor] spaces wholly or partially underground, or having a wall or ceiling forming part of a channel or tank, over or near water areas, or any area subject to water spray, unless otherwise designated on the drawings. Provide NEMA 4X (SS) enclosures.

4. Corrosive location: Areas where chlorine or sulfur dioxide gas under pressure, sulfuric acid or liquid polymer are stored or processed. Provide NEMA 4X (non-metal) enclosures.

5. Below grade locations: All electronic or otherwise equipment sensitive to moisture or flooding shall be mounted in a NEMA 6P rated enclosure.

1.11 MATERIAL AND EQUIPMENT INSTALLATION

A. All equipment shall be located and installed so that it will be readily accessible for operation and maintenance. The DISTRICT reserves the right to require minor changes in location of outlets or equipment, prior to roughing in, without incurring any additional costs or charges.

B. All electrical equipment and appurtenance facilities, which are separately mounted or anchored, shall be so installed as to be in conformance to all requirements of the Uniform Building Code, latest edition, both for vertical and seismic loading. Provide housekeeping pads for floor or pad mounted equipment.

C. Follow the manufacturer's installation recommendations unless otherwise indicated. Keep copy of the manufacturer's installation instructions available on the job site for review at all times.

1.12 SEISMIC REQUIREMENTS

A. All electrical, mechanical, and instrumentation equipment and appurtenant facilities which are separately mounted or anchored shall be so installed as to be in conformance to all requirements of the California Building Code, both for vertical and seismic loading. This requirement applies, but is not limited to, such items as light fixtures, electrical and instrumentation panels, tanks, pumps, piping, pipe supports and hangers, generator, motors, fans, ventilating ducts and equipment, and other similar equipment or facilities in excess of 400 pounds.

B. All components of this facility shall be considered essential for the purpose of determining seismic force values. The seismic zone shall be considered Zone 4 for this project.

1.13 CUTTING AND PATCHING

A. Do not cut or notch any structural member or building surface without specific approval of the DISTRICT. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, paving, or other surfaces required for the installation, support, or anchorage of materials and equipment. Following such work, restore surfaces neatly to new condition using skilled craftsmen of the trades involved, at no additional cost to the DISTRICT.

1.14 UTILITY COORDINATION

A. Coordinate the new electrical service.

1. The CONTRACTOR shall pay all costs for utility work shown on the Plans and described in the Specifications. The CONTRACTOR shall coordinate the completion of forms, even where the DISTRICT is filling out the majority of the form. The CONTRACTOR is responsible for providing trenching, conduit, concrete encasement, risers, primary and secondary conductors, medium voltage terminations, transformers, transformer pads, pullropes, poles, pull sections and meters per base requirements. The CONTRACTOR is responsible for coordinating inspections, site visits and all paperwork to completion.
2. For additional requirements see: Electric+Construction+Standards+2021+REVISED.pdf

B. Provide temporary power during construction. Remove temporary power equipment at end of the project.

1.15 INSPECTION

A. The CONTRACTOR shall cooperate with the DISTRICT and shall provide assistance at all times for the inspection of the electrical work. Remove covers, operate machinery, or perform any reasonable work, which in the opinion of the DISTRICT, will be necessary to determine the quality or adequacy of the work.

B. If any material does not conform with these specifications the CONTRACTOR shall, within three days after being notified by the DISTRICT, remove the materials from the premises.

C. Work shall not be closed in or covered before inspection and approval by the DISTRICT. Cost of uncovering and making repairs where uninspected work has been closed in shall be borne by the CONTRACTOR.

1.16 SUPERVISION AND WORKMANSHIP

A. The CONTRACTOR shall employ a competent electrical foreman on the job throughout the entire period of construction to see that his work is carried on without delay and completed as rapidly as possible.

B. Before the start of construction and in conjunction with the schedule of other Contractors, the Electrical Sub-Contractor shall furnish to the DISTRICT a tentative construction schedule showing the order of the work, the pedestal and control panel shop drawings submittal dates, scheduled manufacturing dates, and the anticipated delivery dates.

1.17 COOPERATIVE WORK WITH OTHERS

A. The CONTRACTOR shall cooperate with others, with due regard to their work, towards promotion of rapid completion of project. If any cooperative work must be altered due to lack of proper supervision of such, or failure to make proper provision in time by CONTRACTOR, then he shall bear expense of such changes as necessary to be made in work of others.

B. Labor and materials, including templates, sleeves, anchors, concrete inserts and the like shall be furnished in ample quantities at such times as necessary to ensure uninterrupted progress of work.

C. CONTRACTOR shall cease work at any particular point temporarily and transfer his operations to such points or execute such portions of work as directed, when in the judgment of the DISTRICT it is necessary to do so.

D. Meet with the DISTRICT during the submittal process to coordinate delivery and installation of DISTRICT supplied equipment. Meet for 4 hour, take minutes, distribute minutes. Reference Specification Sections 16930 and 17010.

E. Meet with DISTRICT prior to starting field and start-up process to coordinate schedules tasks. Meet for four hours, take minutes and distribute minutes. Reference Specification Sections 16930.

PART 2 PRODUCTS

2.1 ANCHORS AND FASTNENERS

A. Fasteners and anchors for securing equipment to walls, floors and the like shall be stainless steel. When fastening to walls, floors, and the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements.

B. Where seismic calculations have been submitted and approved, provide recommended fasteners and anchors.

C. Where manufacturer provide specialty braces to meet seismic requirements for their equipment, install the braces per the manufacturers' recommendations.

2.2 EQUIPMENT IDENTIFICATION

A. All panelboards, starters, control panels, internal control panel components, all disconnect switches and circuit breakers, transformers, push buttons, controls, instruments, boxes, etc. shall be properly identified with a descriptive nameplate. Nameplates shall be made of 1/6 inch laminated plastic with white background and black letters. Size of letters shall be 1/4 inch high, minimum. Letters shall be machine engraved. All nameplates shall be screw mounted with oval head machine screws tapped into metal. Adhesive material shall not be used. Every cubicle in the motor control center shall be provided with a nameplate with 1/2" high lettering.

2.3 SPARE PARTS, CONSUMABLE ITEMS, AND TOOLS

A. The CONTRACTOR shall supply all spare parts prior to functional acceptance test. All parts shall be sealed in plastic bags and delivered to the site in a heavy-duty plastic storage box.

B. In addition to spare parts described elsewhere in these Specifications, provide:

1. Fuses. Provide 20 percent of each size and type used rounded to the next whole number, but no less than three of each size and type.

2. Indicating Lamps. Provide 20 percent of each size and type used rounded to the next whole number, but no less than 10 of each type.

PART 3 EXECUTION

3.1 CLEANING

A. After all other work has been accomplished pedestals, starters, panelboards, control panels and all other electrical equipment shall be cleaned of all dust, dirt, grease, plaster, paint or other marks, by the CONTRACTOR. All meter enclosures, panelboards, switchboards and motor control centers shall be "touch-up" painted to match original colors.

3.2 TESTING, GENERAL

A. Testing, test plans, and test reports shall be provided by the CONTRACTOR as specified herein. The CONTRACTOR shall perform tests as required to demonstrate that the equipment and systems covered in this Specification operate safely and meet the requirements of these Specifications. The CONTRACTOR shall provide labor, instruments, and other material to complete the tests.

1. Perform the Operational Readiness Test and Functional Acceptance Test.

2. Perform independent testing services for the electrical system prior to Functional Acceptance Test.

3. Perform other specific test required by Specification Sections in Division 16.

4. Perform support activities for the final facilities, described throughout the Specifications (i.e. additional factory and field testing).

B. Operational Readiness Test (ORT)

1. Point-to-Point Wire Check. After installation, termination, and identification of conductors, perform a point-to-point wire check to verify that all wiring has been properly installed and identified, and that there are no shorts between wires, shields, and ground. Lift wires from terminals as required to perform this test.

2. Insulation Test. Perform a megger test on all control and power wiring. The DISTRICT shall be notified at least 1 week prior to the insulation test so that the testing maybe witnessed.

3. Motor Test. Submit test data showing (for every motor): Perform a winding resistance check of each phase. Amperes in each phase with motor loaded; motor nameplate amperes; Thermal overload element rating and catalog number. At time of test record voltage at switchboard for all three phases. Check for correct rotation of mechanical equipment.

4. Control System Test. Test the control panel and related hardware, terminations and control strategy and enter all setpoints. Tune the system. Coordinate activities with DISTRICT (Control Systems Engineer).

D. Functional Acceptance Test (FAT)

1. The CONTRACTOR shall perform the FAT after he has delivered written notice to the DISTRICT that the ORT has been completed.

2. The CONTRACTOR shall inform the DISTRICT at least 2 weeks prior to the FAT so that the DISTRICT may witness the test.

3. The FAT shall operate all equipment and systems over the full operating range, shall demonstrate proper operation of alarms and indicators, and, in general, shall demonstrate that the equipment and systems meet the requirements of the Drawings and Specifications.

4. If any equipment or system fails the FAT, the CONTRACTOR shall correct the problem and shall repeat the test until it is successful.

5. The FAT shall be performed in the presence of the DISTRICT.

E. Final System Testing

1. Provide resources and personnel, on site, as necessary, to support the effort required to complete testing of the facility in a timely manner.

2. Resources include testing equipment and tools.

3. Personnel to include a sufficient number of electricians to facilitate start-up and coordinate with DISTRICT (Control System Engineer).

3.3 TRAINING

A. The CONTRACTOR shall provide four man-hours for general training of the operation of the electrical and instrumentation systems to DISTRICT personnel.

B. Instructions shall consist of the functional description of each piece of equipment, including calibration and setting of set points. Demonstration of the operation of each system shall be included.

C. The CONTRACTOR shall provide all manuals and study materials required for the training of DISTRICT's personnel.

3.4 WARRANTY

A. The CONTRACTOR shall leave the entire electrical system in proper working order and shall, at his own expense, replace any work, material, or equipment furnished by the firm which develops defects within one year from the date of final acceptance unless otherwise described.

B. The control panel supplier (systems integrator) 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 delivered; and of implementing corrective measures.

C. If the control panel supplier (systems integrator) fails to respond in 2 working days, the DISTRICT at its option will proceed to have the warranty work completed by other resources; the total cost for these other resources shall be reimbursed in full by the CONTRACTOR. The use of other resources, as stated above, shall not change or relieve the CONTRACTOR or supplier from fulfilling the remainder of the warranty requirements.

D. Prior to "final acceptance", the CONTRACTOR shall furnish to the DISTRICT a listing of warranty information for all manufacturers of materials 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. Manufacturers warranty expiration date.

4. Completed test forms.

END OF SECTION

SECTION 16110

RACEWAY AND FITTINGS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The work under this section includes all equipment, labor and material necessary to furnish and install a complete raceway system including fittings, boxes and supports.

B. Raceway shown in the schedule with multiple conduits shall be used for installing different types of conductors; for example power (120, 208, 240 and 480 VAC) conductors in the first conduit, control (discrete 24 and 120 VAC) conductors in the second and signal (analog 4-20 mA, 24 VDC and other instrumentation) conductors in the third.

1.2 QUALITY ASSURANCE

A. All raceway shall comply with applicable standards of the Underwriter's Laboratories, Inc.

B. Conduits, entering the bottom of pad mounted equipment under enclosure structural members design to be flush with the pad, shall be removed, reworked and reinstalled properly, so the conduit enters the manufacturer’s recommended conduit area, unobstructed. These modifications to conduit and pad shall be at the CONTRACTOR’s expense.

C. Do not cut, bend or deform the mater/main enclosure, panelboards, control panel or equipment enclosure steel to accommodate conduits.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit, in accordance with the requirements of Section 16010 the following materials and information:

1. A list of materials to be furnished, the name of the suppliers and the date of delivery of materials to the site.

2. Catalog data sheets and manufacturer’s information all equipment described in this Specification Section.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and equipment to project site in manufacturer's original packaging with labeling showing product name, brand, model, project name, address, and CONTRACTOR's name. Store in a location as agreeable with DISTIRCT, secure from weather or accidental damage.

PART 2 PRODUCTS

2.1 CONDUIT

A. Rigid Steel Conduit (RSC)

1. Rigid steel conduit shall be hot dip galvanized on the exterior and may be zinc or enamel on the interior meeting the requirements of UL-6 and ANSI C80.1.

2. Couplings, locknuts, and all other fittings shall be hot dip galvanized. All couplings and locknuts shall be of the threaded type only.

3. Bushings for standard weight rigid steel conduit shall be non-metallic for 1 inch and smaller. For conduits larger than 1 inch, insulated metallic bushings shall be used.

B. Plastic Coated Rigid Steel Conduit (PCRSC)

1. Plastic coated rigid steel conduit and fittings shall be hot dip galvanized prior to the plastic coating. The galvanized surfaces shall be coated with an epoxy-acrylic primer before plastic coating. The plastic coating shall be applied by the dip method. Minimum thickness of the exterior coating shall be 40 mils. The interior of conduit and fittings and all male threads shall be coated with 2 mils of urethane. PCRSC shall be manufactured by Rob Roy, Ocal or equal.

2. Couplings, locknuts, and all other fittings shall be hot dip galvanized and plastic coated. All couplings and locknuts shall be of the threaded type only. All couplings shall have longitudinal ribs 40 mils in thickness. Condulets shall be supplied with stainless steel screws. All screws shall be encapsulated in plastic.

3. Enclosure sealing hubs shall be similarly coated and be manufactured by Meyers type or equal.

4. Bushings for standard weight rigid steel conduit shall be non-metallic for 1 inch and smaller. For conduits larger than 1 inch, insulated plastic coated metallic bushings with grounding connection, where required, shall be used.

5. All damaged coatings shall be repaired according to the manufacturer's instructions.

C. Flexible Metallic Conduit (Flex)

1. Flexible metallic conduit shall be hot dipped galvanized steel.

2. Neoprene jacketed flexible metallic conduit shall be used in all damp or weatherproof locations where flexible conduit is required.

3. Fittings for flexible metallic conduit shall be hot dipped galvanized or sheradized, squeeze type. Fittings which use a screw to bind against tubing will not be accepted. Fittings for neoprene jacketed flexible conduit shall be of the screw in type.

D. Flexible Non-Metallic Conduit (NMFlex)

1. Flexible non-metallic conduit and fittings shall be heavy duty PVC. Conduit shall consist of PVC spiral surrounded by flexible PVC.

2. Flexible non-metallic conduit shall be liquid tight and fittings shall be corrosion resistant with stainless steel retaining rings. Provide sealing gaskets at all threaded connections. NMFlex shall be manufactured by Thomas and Betts or equal.

E. Polyvinylchloride Conduit (PVC)

1. PVC Conduit shall be rigid heavy weight type, Schedule 40 when encased in concrete or schedule 80 when exposed or not encased in concrete. PVC conduit shall be supplied complete with PVC fittings. PVC conduit shall be manufactured by Carlon or equal.
2. Utility company conduits may require oversized Schedule 80 in part or in whole.

F. Electrical Metallic Tubing (EMT)

1. In general, EMT is not used on this project.

2.2 CONDUIT SUPPORTS

A. Pipe hangers for individual conduits shall be factory made, consisting of a pipe ring and threaded suspension rod. The pipe ring shall be malleable iron, split and hinged, or shall be spring-able steel. Rings shall be bolted to or interlocked with the suspension rod socket.

B. Pipe racks for groups of parallel conduits shall be constructed of galvanized structural steel preformed channels of length as required. Racks or channel shall be suspended on threaded rods and secured with nuts above and below the cross bar or bolted to concrete walls with stainless steel anchors.

C. Pipe straps shall be the two piece bolted type. Pipe straps shall be coated to be compatible with the conduit (and coating) installed.

D. Conduit support components shall be manufactured by Unistrut, B-line or equal. Channel and associated hardware shall be stainless steel.

2.3 CAST BOXES

A. Cast boxes shall be galvanized, threaded, cast malleable iron. Cast boxes shall be manufactured by Appleton, Feraloy, Crouse-Hinds, type FS or FD, or equal. Hub arrangements on threaded fittings shall be the most appropriate for the conduit arrangement required in each case to avoid unnecessary conduit bends and fittings.

B. Use plastic coated cast boxes with plastic coated conduit.

2.4 UNDERGROUND VAULTS, PULLBOXES AND HANDHOLES

A. Provide underground vaults, pullboxes and handholes, where shown on drawings or required by length of conduit runs. Underground vaults and pullboxes shall be pre-fabricated concrete type shall be manufactured by Christy Concrete Products, Brooks or equal. All pullboxes shall have standard galvanized steelholddown bolts and hardware. Vaults and boxes located in paved areas or other areas over which vehicles normally may travel shall have traffic covers. All covers shall be labeled appropriately, i.e. ELECTRICAL, SIGNAL, TELEPHONE, etc... Provide cable supports in vaults and large boxes. Cable supports, saddles, arms, and racks mounted in pullboxes shall be manufactured by Underground Devices or equal.

2.5 WIRE GUTTERS

A. Wire gutters shall be NEMA 4 with neoprene gaskets on the hinged doors or removable covers. Box and gutter sizes, metal thickness, and installation details shall comply with the National Electrical Code. Wire gutter shall be manufactured by Hoffman or equal.

2.6 DUCT SEAL

A. Duct seal shall be non-hardening compound designed for sealing between conduit and electrical cable. Duct seal shall be manufactured by O.Z., Gedney DUX or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. General. Unless otherwise specified or indicated, wiring shall consist of insulated conductors installed in raceways of the types indicated. Provide pullboxes or conduit bodies in addition to those shown on the Drawings to limit the number of bends as required by the NEC.

1. Minimum size conduit installed on this project shall be 3/4 inch.

2. Use the following types of conduit for the locations listed, unless indicated otherwise:

   a. Use galvanized rigid steel conduit (GRS) for all exposed, dry locations.
   b. Use plastic-coated steel conduit (PCRSC) outdoors in wet and damp locations and below grade for elbows and risers.
   c. Use rigid polyvinyl chloride (PVC) conduit for concealed locations, below grade for direct-buried conduit, for embedded conduit and conduit installed below grade in concrete encased duct banks, except use plastic coated steel conduit (PCRSC) at least 5 feet on both sides of

penetrations through building footings and outside walls, under equipment mounting pads, where embedded in exterior light pole foundations, and where conduit changes from underground to exposed or from embedded to exposed. Also use in corrosive spaces and where required by a utility company.

d. Use liquidtight flexible metal conduit (flex) with steel fittings for the last 18 to 36 inches of conduit run to a piece of equipment where required to isolate vibration or to facilitate maintenance or adjustment.

e. Electrical metallic tubing (EMT) shall not be used on this project.

B. Conduit Installation

1. Conduit system installation shall meet or exceed the requirements of the 2023 NEC.

2. Raceways shall be concealed or exposed, as indicated, and shall be at least 6 inches away from parallel runs of flues and steam or hot water pipes. Group raceways in same area together. Raceways shall be supported at intervals required by the NEC and shall have exposed runs installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Avoid field-made bends and offsets where possible, but where necessary make with an approved hickey or conduit bending machine. Heating of conduit to facilitate bending shall not be acceptable, except as noted hereinafter. Changes in direction of runs shall be made with symmetrical bends or cast metal fittings. Do not install crushed or deformed raceways. Avoid traps in raceways where possible. Take care to prevent the lodging of plaster, dirt, or trash in raceways, boxes, fittings, and equipment during the course of construction. Raceways shall be entirely free of obstructions or shall be replaced. All conduit shall be reamed, deburred, and cleaned for proper introduction of wires and cables. Immediately after installation, plug or cap all conduit ends with watertight and dust tight conduit seals until the time for pulling wires. In block walls, do not run conduit in the same horizontal course with reinforcing steel.

3. Install bushings on the ends of all conduits, except where conduits terminate in threaded hubs on cast boxes or cabinets. Provide plastic inserts where conduits terminate in threaded holes in cast boxes. Provide suitable expansion fittings for raceways crossing expansion joints in structures or concrete slabs, or provide other suitable means to compensate for expansion and contraction.

3. All conduit supports, fasteners, and accessories for metal conduit shall be galvanized steel.

4. Conduit shall be of the greatest practicable single length between joints. Joints shall be made up with approved jointing compound. Do not use red lead as a joint compound. Do not use nails to fasten conduit. Do not use wire in lieu of straps or hangers, and do not notch structural members for the passage of raceways except with prior approval of the DISTIRCT.

5. Install and equip conduit, boxes, and fittings installed outdoors or in other wet or damp locations so as to prevent water from entering the conduit. Provide sealing

hubs. Do not run conduit in equipment foundation pads.

6. Provide a suitable seal inside each conduit or raceway entering buildings and structures, raceways entering boxes and enclosures in wet or hazardous locations.

7. Empty ducts and conduits shall be identified at both ends and shall be capped and provided with a 1/8-inch-minimum nylon cord, unless noted otherwise.

8. The CONTRACTOR shall run a mandrel through all unexposed conduits immediately prior to wire or pullstring installation to ensure conduits are clear of debris and foreign objects.

9. For PVC conduit, use factory-made ells where applicable. Use approved heating methods for forming all other bends (less than 12 degrees). Provide expansion joints as required or as recommended by the manufacturer. When joining PVC conduit to metallic fittings, use approved PVC terminal adapters. When joining PVC conduit to rigid steel conduit, use an approved PVC female adapter. PVC conduit joints shall be solvent-welded with solvent recommended by the conduit manufacturer. Where PVC conduit is used, a separate grounding conductor shall be run with the conductors.

10. Concealed, embedded, and buried conduits shall emerge at right angles and shall have none of the curved portion of a bend exposed, unless otherwise approved by the DISTIRCT. Where slabs are on grade, install conduit beneath the slab and not in the slab. Where ells are required to penetrate floor slabs, the ells shall be galvanized rigid steel conduit.

11. Where conduit size is 4 inches or less, final connection to motors, motor heaters, wall- or ceiling-mounted fans and unit heaters, dry transformers, and to other equipment where flexible connection is desired or required to minimize vibration or to facilitate maintenance or removal of equipment, shall be made with flexible conduit. Length shall be 18 to 36 inches, unless otherwise approved by the DISTIRCT.

12. Flexible conduit shall never be used as a ground. Flexible conduit shall be secured with conduit clamps or equivalent means except where the flexible conduit is fished and where sections less than 4 feet in length are used in concealed areas for lighting fixtures.

13. Exposed conduit shall be neatly installed parallel to or at right angles to the structural members.

14. Exposed conduit stubbing up through the floor into the bottom of exposed panels, cabinets or equipment shall be lined up, properly spaced and shall be straight and plumb. Conduits shall be installed at sufficient depth below the floor to eliminate any part of the bend above.

15. Maintain at least 12 inches of separation between conduits carrying power and instrumentation cables.

16. Provide large radius elbows and LBs when entering existing buildings and enclosures.

17. Provide a suitable seal inside each conduit or raceway entering buildings and structures, raceways entering boxes and enclosures from chemical storage rooms. Seal inside the conduit with oakum or suitable plastic expansible compound to prevent passage of insects, rodents, gasses, and liquids.

18. Where flexible equipment chords are utilized for final connection to equipment use a compression type seal fitting. Crouse-Hinds CGB or equal.

C. Underground and Embedded Conduit

1. In general, trenches with two or more underground conduits shall be red concrete-encased PVC conduits (duct bank). In general, a single underground conduit in trench shall be sand encased schedule 40 PVC with Plastic coated rigid steel conduit risers and elbows (PCRSC). Conduit under concrete slabs and foundations may be schedule 40 PVC conduit with PVC coated rigid steel conduit transitions and risers. Underground conduits provided for utility cabling shall meet the requirements of the serving utility

2. Except as otherwise indicated, underground and embedded conduit shall be 24 inches deep, except conduit under building slabs may be just below the slab or where shown otherwise. Do not embed conduit in slabs. Conduit installation shall meet the requirements of the NEC.Underground conduit minimum depths and fill for utility shall be per utility standards and as detailed.

3. Separate parallel runs of four or more conduits in a single trench or embedded duct bank with preformed, nonmetallic spacers designed for the purpose. Install spacers at 6 feet or at intervals not greater than that specified in the NEC for support of the type of conduit used. Support conduits installed in fill areas suitably to prevent accidental bending until backfilling is complete.

4. Groups of conduit shall be arranged substantially as shown on the Drawings, but minor changes in location or cross sectional arrangement shall be made as necessary to avoid obstructions, etc. Where conduit runs cannot be installed substantially as shown because of conditions not discoverable prior to digging of trenches, the condition shall be referred to the DISTIRCT for instructions before further work is done. Underground conduit work shall be coordinated with other construction work.

5. All underground conduit shall be mandrelled prior to pulling wires/cables.

D. Trenching and Backfill

1. Unless otherwise noted, conduit shall have a minimum cover of 24 inches. Trench bottoms shall be free of rocks and other hard objects. For direct buried cable and when rocks that cannot be removed are encountered at the trench bottoms, sand bedding material shall be used for a depth of 3 inches below the conduit. In any case, bedding material shall be used for the zone 6 inches above

the direct burial conduit.

2. Bedding material shall contain no rocks larger than 3/4 inch in diameter and shall be free from roots and debris.

3. Where conduit trenches are located in roads or in structural backfill, the compaction requirements shall be as required by the agency that has jurisdiction for those areas. Where conduit trenches are located in an area where backfill material specifications are more rigid than those of this Section, the trench backfill shall meet the more rigid specification. In any event, trench backfill compaction shall be as required by the Specifications.

4. Conduits shall be placed parallel in the bottom of the trench. Where conduits are required to cross, they shall be separated by a minimum of 3 inches of bedding material. Where more than one level of conduit is placed in the same trench, they shall be separated by a minimum of 3 inches of bedding material.

5. Conduit trenches in paved or improved areas shall be installed and backfilled before the area is paved or improved.

6. For trenches through existing paving, the paving shall be saw cut in order to obtain a neat vertical edge for repaving. Saw cuts shall be parallel and shall be a minimum of 6 inches outside of the trench area. Unless covered by other sections of the Specifications, paving shall be replaced in accordance with the original paving Specifications.

7. All existing improvements damaged as a result of the CONTRACTOR's operation shall be reconstructed by the CONTRACTOR at no cost to theDISTRICT.

E. Penetrations

1. Penetrations may be cast in place or run through blockouts or holes, except where waterproof penetrations are required. Dry pack with nonshrink grout around conduits run through blockouts or holes.

2. Where a waterproof penetration through a concrete structure is shown on the Drawings or called out elsewhere in the Specifications, an approved malleable-iron watertight entrance sealing device shall be provided. Each end of the device shall have a gland-type sealing assembly with pressure bushings which may be tightened at any time, except where a concrete envelope is specified or shown on the Drawings. Where there is a concrete envelope specified or shown on the Drawings, a sealing gland assembly may be on the more accessible side only. The device shall be securely anchored into the concrete with one or more integral flanges. The sealing device shall be OZ/Gedney Type WSK, or equal.

F. Boxes

1. Provide each outlet in the wiring or raceway systems with an outlet box to suit the conditions encountered. Each box shall have sufficient volume to accommodate the number of conductors entering the box in accordance with the requirements

of the NEC. Provide flush or recessed fixtures with separate junction boxes when required by the fixture terminal temperature requirements. Boxes used with concealed conduits shall be flush mounted, unless otherwise indicated. Boxes must be accurately placed for finish, independently and securely supported by manufactured box hangers. Fixture outlets shall be located symmetrically.

a. Install cast boxes outdoors, in wet or damp locations, with exposed conduit and with embedded and buried conduit. Cast boxes installed with threaded conduit shall have threaded hubs. Cast boxes installed with PVC or plastic coated conduit shall be similarly coated.
b. Boxes in concealed conduit systems, other than in cast-in-place concrete and exterior faces of walls or where weatherproof devices are required, shall be galvanized or cadmium plated steel.

2. Underground pullboxes shall be sized by CONTRACTOR in accordance with NEC. Underground pullboxes shall be precast concrete type as shown on the Drawings complete with steel traffic covers, extension rings and concrete bases. Entire box shall be sealed to prevent entrance of mud and rainwater. Conduits shall enter box horizontally, not vertically. Conduit entry shall be grouted in place with approved insulated bushings. Seals shall be installed in conduits around conductors to prevent water from entering the conduit system.

3. Unless otherwise shown on the Drawings, install boxes in a rigid and satisfactory manner, and support boxes independently of the conduit. For frame construction, use bar hangers; on concrete or brick, fasten directly to the surface using bolts or expansion shields; on hollow masonry units, use toggle bolts or expansion shields; and on steelwork, use machine screws. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields. Where boxes are flush mounted in walls, if not embedded in concrete, the hole shall be no larger than required to receive the box. Set flush-mounted sheet steel boxes flush with the finished surface, providing them with suitable extension rings or plaster covers as required. Mounting hardware in industrial areas shall be galvanized.

3.2 ELECTRICAL CONTINUITY

A. The entire electrical raceway system shall form a continuous metallic electrical conductor from service point to every outlet and shall be grounded by connection to the main service ground.

B. Rigid steel conduit shall have threads filled with conductive sealant before screwing into fittings.

C. A ground wire shall be installed in all conduits.

3.3 TRENCH SETTLING

A. If at any time during a period of one year dating from the date of final acceptance of the project, there shall be any settlement of conduit trenches, the DISTIRCT may notify the CONTRACTOR to immediately provide additional fill and to make such repairs or

replacements in paving, planting, or structures, as may be deemed necessary at the CONTRACTOR's expense.

3.4 TRENCHING

A. Verify the location of all existing cables, conduits, piping, and other equipment in or near the areas to be trenched, prior to starting trenching. Repair any equipment damaged during trenching. Trenches shall not be left unattended unless the area is fenced or barricaded to restrict entry to the area. Call an Underground Service firm before trenching.

3.5 TESTING

A. After installation has been completed, CONTRACTOR shall conduct tests required by Section 16010, General Requirements, Electrical.

****END OF SECTION****

SECTION 16150

MISCELLANEOUS ELECTRICAL EQUIPMENT

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required, and install, complete ready for operation, and field test the miscellaneous electrical equipment as shown on the Drawings and/or specified herein.

1.2 QUALITY ASSURANCE

A. All equipment and components shall comply with applicable standards of the Underwriter's Laboratories, Inc.

B. Provide enclosures suitable for the type of location in which they are located per Specification Section 16010, General Requirements, Electrical

1.3 SUBMITTAL

A. The CONTRACTOR shall submit, in accordance with the requirements of Section 16010 the following materials and information:

1. A list of materials to be furnished, the name of the suppliers and the date of delivery of materials to the site.

2. Catalog data sheets and manufacturer’s information for all equipment covered by this Specification Section.

B. Submit metering equipment and devices to the utility company in compliance with their requirements.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and equipment to project site in manufacturer's original packaging with labeling showing product name, brand, model, project name, address, and CONTRACTOR's name. Store in a location as agreeable with DISTRICT, secure from weather or accidental damage

PART 2 PRODUCTS

2.1 TERMINAL BLOCKS

A. Terminal blocks shall be side entry, snap-in type for mounting on DIN rail. End clamps and end cover plates shall be provided to hold terminal blocks in place. All components shall be rated for 600 Volts.

C. At each starter or control panel terminate all alarm, control, and any other wiring at identified numbered terminal blocks. AC and DC terminals shall be separated. Power terminal blocks shall be separated from controls and instrumentation terminal blocks. Provide a ground terminal point for each cable shield. Stacked terminal blocks will not be accepted.

D. Fuses shall be incorporated into the terminal blocks when not shown on a door or panel face. Fuse blocks shall include blown fuse indicator and be disconnecting type.

E. Provide 20% spare terminal, but not less than ten points with each terminal block.

2.2 RELAYS

A. Control relays shall be plug-in type with hold-down clamps and led indicators, unless noted otherwise. Plug-in relays shall be UL listed, enclosed, with contacts rated 10 amps at 120-volts-60 Hz, and 28 volts DC. Enclosures shall be clear plastic. Relays shall operate reliably at 80 percent of rated coil voltage. Coil burdens shall be not greater than 1.5 watts for DC coils or 2.6 VA for 60-Hz coils. The relays shall be IDEC RR Series, or equal.

B. Machine tool type relays shall be rated B300. Machine tool relays shall be manufactured by Allen-Bradley, Cutler-Hammer, Square D or equal.

C. Time delay relays with required ranges up to 180 seconds shall be enclosed and shall operate properly at any voltage within plus or minus 15 percent of the nominal voltage rating, and shall have a time delay on energization or deenergization, as required, which is knob-adjustable over the range 2 to 180 seconds. They shall have double-pole double-throw contacts rated 10 amps at 120 volts, 60 Hz. Time delay relays shall be manufactured by Idec RTE series, or equal.

D. Phase/Power Failure Relays (PFR) shall detect phase over voltage and under voltage conditions. Provide an adjustable drop out setting and an adjustable time delay on drop out. Phase failure relays shall be manufactured by Diversified, Timemark or equal.

2.3 WIRING DEVICES

A. Light switches shall be specification grade and shall be manufactured in accordance with UL 20. Switches shall be single pole, rated for 20 amps at 277 VAC. Switches shall be Hubbell 1221, Leviton 1201-2, or equal.

B. Receptacles shall be duplex and rated 20 amps at 120 VAC, 2 pole, 3 wire, NEMA type 5-20R and specification grade. Receptacles shall be Hubbell, Leviton or equal, GFI type where shown on the Plans.

C. Where surface mounted, provide a [FS style] cast box and cover plate.

D. Device cover plates shall be suitable for the environment in which they are installed. Stainless steel cover plates inside and weatherproof covers outside. Where weather protection is required with a plug in the receptacle, clear plastic bubble covers shall be provided.

2.4 DISCONNECTS

A. Heavy duty, motor rated switches fused or non-fusible as indicated on the Drawings, shall be provided as required. General duty switches will not be allowed. Switches shall have "Quick-break" actuating mechanisms and shall be enclosed as required by the conditions of installation. The cover shall be interlocked with the switch such that the enclosure cannot be opened with the switch in the "on" position. The "on" and "off" positions shall be clearly marked by the manufacturer. The switch shall be capable of being locked in the open position. Provide enclosures suitable for the specific type of location in which they are installed. Disconnect switches shall be manufactured by Cutler-Hammer, Square D or equal. Disconnect switch enclosures shall meet the requirements of Specification Section 26 01 01.

2.5 SURGE PROTECTION DEVICE.

A. The surge protection devices (SPD) shall be designed to protect all AC electrical circuits and connected equipment from destructive, damaging or disruptive effects of lightning induced transients, normal utility load switching activities and internal generated transients. The SURGE suppression device shall be parallel configured, solid state, voltage clamping components demonstrating threshold suppression characteristics. Clamping components shall be metal oxide varistors. All suppression devices shall be encapsulated and mounted in a NEMA RATED enclosure. The unit shall be rated for 120 KA per phase and 60 KA per mode minimum. The device shall have all normal mode (L-L and L-N) and common mode (L-G and N-G) circuit paths protected with suppression components. The device shall be rated for 480/277 V systems, shall include a remote alarm form C contact. The device for the facility service entrance shall be installed in accordance with the manufacturer’s recommendations. The manufacturer shall provide a ten year warranty. The SPD unit shall be manufactured by Square D, Eaton, Leviton, Liebert or equal.

2.6 ENCLOSURES

A. Provide NEMA rated enclosures where shown on the drawings, required by these Specifications or required by the NEC. Enclosures shall be by Tesco, Hoffman or equal.

2.7 LIGHT FIXTURES

A. Lighting fixtures should be provided as scheduled, however; fixtures of similar design, having equivalent mechanical characteristics and virtually identical luminous intensity distributions and luminances over the angles of interest (in at least the perpendicular and parallel planes), may be submitted for approval. Sufficient photometric and mechanical data must be provided with the submittal for a substitute fixture to allow for meaningful comparison with the specified item. A sample of any or all substitute lighting fixtures may be required to be furnished to the DISTRICT for physical evaluation to determine the acceptability of the substitute item. When making substitute fixture submittals, allow sufficient time for this process.

2.8 SMOKE DETECTORS

A. Provide Fire Marshall approved smoke detectors and other devices as required to provide a complete and operational system acceptable to the local jurisdiction. All detectors and devices shall include output contacts and built in audible alarms.

2.9 INTRUSION SWITCHES

A. Provide components for the intrusion detection system, installed, connected and tested.

B. Switches

1. Roll-up Doors/Hatch/Cover/Tank monitoring switches (ZS) shall be Square D, Class 9007, model ZCKJ2 with plunger wheel or roller arms and other accessories required to complete the installation, or equal.
2. Outer door type intrusion switches shall be the industrial grade, magnetic type with stainless steel armored cable designed for door mounting and allowing for a 3-inch gap distance. The intrusion switches shall be as manufactured by Sentrol 2500 Series or equal.

2.10 PILOT DEVICES

A. Indicating pilot lights shall be LED, low voltage transformer operated, with integral push to test button. Pilot lights shall be rated NEMA 4/4X and be 30.5 mm in diameter. Pilot lights shall be manufactured by Eaton, Square D or equal.

B. Selector switches and pushbutton switches shall be heavy duty type and match pilot lights. Switches and pushbuttons shall be rated NEMA 4/4X and be 30.5 mm in diameter. Switches and pushbuttons shall be manufactured by Eaton, Square D or equal.

C. Running time meters shall be non-reset, 0-99,999.9 hour range, 120 VAC manufactured by Eaton, Square D or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Equipment installation, including supports, anchors, and restrainers, shall meet the requirements specified in Section 16010, General Requirements, Electrical.

B. Install freestanding equipment in accordance with the manufacturer's recommendations. Secure freestanding equipment rigidly to floors or mounting pads with anchor bolts, expansion shields, or other approved means. Install wall mounted equipment in a similar manner, plumb, with appropriately sized anchors.

C. Lighting fixtures shall be installed as indicated on the Drawings. Provide all brackets, hangers, poles, masts, bases and other hardware as may be required for each particular condition of installation.

1.2 TRAINING

A. A factory trained service technician shall instruct operating personnel in the operation, maintenance and adjustment of the all systems. The training shall be four hours in length.

1.3 TESTING

A. After installation has been completed, CONTRACTOR shall conduct tests required by Section 16010, General Requirements, Electrical.

END OF SECTION

SECTION 16155

MOTOR CONTROLLERS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required, and install, complete ready for operation, and field test motor controllers as shown on the Drawings and as described in the Specifications.

B. Motor controllers are to be provided for all motors that will perform the required functions as indicated on the Drawings. Motor controllers are to be provided and/or installed under this Division of these Specifications where not otherwise provided for. Motor size and type as indicated on the Drawings are to be used for reference only - verify data for motors actually provided.

C. Note that motor starting equipment furnished under this Division is to be sized according to nameplate data of the motors *actually* provided. Due to substitutions or other types of equipment modifications, it is not particularly unusual to have motors or equipment provided that have electrical characteristics slightly different than those anticipated during design. Whenever this occurs, make such modifications to the circuit wiring, conduit sizing, disconnecting and starting equipment, and feeder circuit wiring, short circuit and over current protection as required. No additional compensation will be allowed for work or equipment associated with these types of modifications.

D. Where mechanical or process equipment is provided with a specialty protective relay, the relay shall be incorporated into the motor controls at no additional cost to the DISTRICT.

1.2 QUALITY ASSURANCE

A. All starters and controllers shall comply with applicable standards of the Underwriter's Laboratories and be NEMA rated.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit, in accordance with the requirements of Section 16010 the following materials and information:

1. A list of materials to be furnished, the name of the suppliers and the date of delivery of materials to the site.

2. Catalog data sheets and manufacturer’s information for all equipment covered by this Specification Section.

3. Arc flash analysis and signage.

4. Harmonic analysis.

B. Submit shop drawings, including: complete elementary (ladder) diagrams; comprehensive interconnection diagrams for VFD, motor, external control devices and controllers, and other related devices; drawings showing physical arrangement of components; front elevation to scale with overall dimensions, conduit entrance spaces and weights; and Bill of Materials.

C. Submit a list of the manufacturers' recommended spare parts.

D. Submit the qualifications of the service technician and the equipment to be used to perform field testing on the VFDs.

E. Submit field test reports.

F. Submit comprehensive operation and maintenance manuals.

PART 2 PRODUCTS

2.1 MOTOR STARTERS

A. Size per applicable Electrical Codes. Accept the minimum NEMA size shall be size 1. Where a combination starter is required, use a type with circuit breaker disconnecting device unless shown otherwise.

B. Running Overload Protection: An overload relay shall be installed in each ungrounded motor circuit leg. They shall be sensitive to motor current only, have inverse time characteristics, and be of the manual reset type with a reset button operable from the outside of the starter enclosure. They shall be temperature compensated type. Select the overload relay heaters as required by the applicable Electrical Code only after the actual nameplate data for the motor has been determined.

C. Provide and install all control devices not otherwise provided for. This includes specifically: control transformers, pilot devices, push buttons and selector switches, auxiliary contacts, etc., which are required to be mounted on or within the starter enclosure. Each starter contactor shall be provided with at least one extra N.O. auxiliary contact. Control and pilot devices shall be per Section 16150, Miscellaneous Electrical Equipment.

D. All motor starters shall be installed in enclosures suitable to the conditions and provided with a nameplate identifying the equipment controlled.

E. Provide phase failure relays for motor loads over 25 horsepower.

F. Provide and install any specialty relays required by the various pump manufacturers at no extra cost to the DISTRICT.

G. Starters shall be manufactured by Cutler-Hammer, Square D, Allen-Bradley or approved equal.

2.2 VARIABLE FREQUENCY DRIVES

A. All variable frequency drives shall be designed for the service intended and shall be of rugged construction and of ample strength for all stresses, which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately 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.

B. Provide harmonic current input reactors/filters and output reactors as recommended by the VFD manufacturer to minimize harmonic currents.

C. The VFDs shall be Pulse-Width Modulated (PWM) design. The controller(s) shall be suitable for use with any standard NEMA-B squirrel-cage induction motor(s) having a 1.15 Service Factor with horsepower as shown on the plans.

D. The VFDs shall be provided as stand alone system mounted in MCC enclosures. The variable frequency (variable speed) motor controllers shall be of the latest technology used exclusively for providing complete speed control of a three-phase, 460V AC, three phase induction motor driving pump type loads. All VFDs shall be designed to meet the applicable NEMA, UL, IEEE, CSA, IEC, and EN standards. All VFDs shall be microprocessor based and include operator interface unit and appropriate cables.

E. VFDs shall have a continuous output current ratings as shown on the singleline diagram. The rating of the drive shall be based upon a 50 °C ambient environment for the enclosures in which it is installed. All VFDs shall be rated for 150% rated continuous current output for one minute. All VFDs shall be better than 97% efficient at full load and speed.

F. All VFDs shall operate, in HAND mode without the PLC. Provide a door mounted operator interface for each VFD which allows for programming and control of the VFD in the HAND mode.

G. The VFDs shall be manufactured by Allen-Bradley, Square D, ABB or equal. All VFDs must fit into the space shown on the Drawings.

2.4 CONTACTORS

A. Contactors shall be manufactured by the same manufacturer of the starters and of similar style.

PART 3 EXECUTION

3.1 INSTALLATION

A. Motor starter enclosures are to be installed plumb and rigidly secured to structure or equipment with wood screws, bolts and expansion anchors, or machine bolts and locknuts as applicable. Starters mounted in motor control centers shall utilize the MCC manufacturer's standard design.

B. Any special protection relays for pumps, mechanical equipment or motors that are required by any pump or motor manufacturer shall be incorporated into the motor starter control circuit at no extra cost to the DISTRICT.

C. Nameplates shall be installed as indicated in Section 16010, General Requirements, Electrical.

3.2 TRAINING

A. A factory trained service technician shall instruct operating personnel in the operation, maintenance and adjustment of the VFD systems and installation. The training shall be four hours in length.

3.3 FIELD TESTING

A. After installation has been completed, CONTRACTOR shall conduct tests required by Section 16010, General Requirements, Electrical.

B. Provide the services of a factory trained service technician to make final adjustments to equipment and carry out a full operational test in the presence of the DISTRICT. Provide the services of a factory trained service technician to inspect and check out each system before energizing.

C. Perform harmonic testing. Following installation and manufacturer's field test, perform a field test under utility and standby operating conditions. Operate all the VFDs from no load to full load and perform a spectrum analysis to verify that the waveforms are in compliance with IEEE 519 for general systems. Submit a complete certified test report for review by the DISTRICT.

****END OF SECTION****

SECTION 16160

PANELBOARDS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The CONTRACTOR shall provide panelboards as indicated on the panel schedule on the Drawings and as described in the Specifications.

1.2 QUALITY ASSURANCE

A. All panelboards shall comply with applicable standards of the Underwriter's Laboratories, Inc. (UL) and shall be UL listed. They shall be manufactured and tested in accordance with the applicable sections of the latest editions of NEMA PB-1, UL-67, and the NEC.

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall submit, in accordance with the requirements of Section 16010, Electrical General Requirements the following materials and information:

1. A list of materials to be furnished, the name of the suppliers and the date of delivery of materials to the site.

2. Catalog data sheets and manufacturer’s information for all equipment covered by this Specification Section.

PART 2: PRODUCTS

2.1 GENERAL

A. Panelboards shall be of a type and rating as shown on the Drawings. They shall be dead front with hardware for accepting molded case bolt-on circuit breakers of the maximum size allowable in each space. The entire assembly including circuit breakers shall be rated for not less than the available short circuit current shown on the Drawings (22,000 Amps symmetrical when not otherwise indicated). Circuit breakers shall meet the requirements of Section 16180, Overcurrent Protection Devices.

B. Branch circuit connections to the main buses shall be of the distributed phase type as indicated on the panel schedules. Circuit numbering shall be labeled as indicated. Main buses and branch circuit straps shall be copper or electrical grade aluminum with tin or copper plating. Unplatted aluminum current carrying parts will not be accepted. Solid neutral and ground buses shall be provided as required in each panelboard. A separate isolated ground bus shall be provided where shown on the Drawings.

C. Panelboards shall be manufactured by Allen-Bradley, Cutler-Hammer, Square D or approved equal.

2.2 TERMINAL LUGS

A. For copper feeder conductors, mechanical or compression lugs, listed for use with copper conductors, may be used.

B. All lugs (main and branch) shall be UL listed for use with 75 degree C wire.

2.3 CIRCUIT BREAKERS

A. Reference Specification Section. 16180, Overcurrent protective devices.

2.4 ENCLOSURES

A. Enclosures shall be suitable for the conditions encountered. Enclosures shall be surface or flush mounted as indicated. Panelboards shall be suitable for the location in which they are installed. Install NEMA 1 enclosures in dry locations (indoors) and NEMA 3R/12 in wet locations (outdoors). NEMA 3R panels which are not factory gasketed against dust will not be acceptable. Panelboards installed in motor control centers shall utilizes the MCC manufacturer's standard enclosure design.

B. A removable panelboard circuit directory with plastic cover shall be provided on the door.

PART 3 EXECUTION

3.1 INSTALLATION

1. Panelboards are to be installed plumb and rigidly secured to MCC structure using the MCC manufacturer's standard mounting method.

2. Nameplates shall be installed as specified in Section 16010, Electrical, General Requirements.

3. A type written panelboard circuit directory with plastic cover shall be placed in the door rack provided. The circuit functions listed shall be the actual circuits connected at time of occupancy.

END OF SECTION

SECTION 16170

TRANSFORMERS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Provide Dry type transformers for low voltage panelboards as shown on the Drawings.

1.2 QUALITY ASSURANCE

A. All transformers shall comply with applicable standards of the Underwriter's Laboratories, Inc. All transformers shall be UL listed.

1.0 SUBMITTALS

A. The Contractor shall submit, in accordance with the requirements of Section 16010, General Requirements Electrical the following materials and information:

1. A list of materials to be furnished, the name of the suppliers and the date of delivery of materials to the site.

2. Catalog data sheets and manufacturer's information for all equipment covered by this Specification Section.

PART 2 PRODUCTS

2.1 GENERAL

A. Transformer shall be convection cooled NEMA 1 or NEMA 3R enclosed units designed specifically for energy efficient operation and not greater that 80 degree C temperature rise over 40 degree C ambient. Enclosure temperature rise may not exceed 35 degree C. over 40 degree C ambient.

B. Manufacturer shall guarantee that sound level will not exceed NEMA standard for the KVA rating of the transformer. Applicable NEMA standards are as follows:

0 - 9 KVA: 40 db
10 - 50 KVA: 45 db
51 - 150 KVA: 50 db
151- 300 KVA: 55 db
301- 500 KVA: 60 db

C. The core shall be mechanically isolated from the enclosure with rubber vibration absorbers.

D. The windings, for three phase transformers, shall be separate primary and secondary coils factory connected in Delta primary and grounded WYE secondary configuration. A secondary system grounding lug shall be provided prewired to WYE "neutral" and

transformer enclosure. Single phase transformers shall have 120/240 Volt secondary with a grounded neutral.

E. Primary taps shall be full capacity, with a minimum of two 2-1/2% above and below rated voltage.

F. Transformers shall be manufactured by Eaton, Square D Watchdog or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Transformers shall be installed in accordance with manufacturer's instructions and the requirements of the NEC. Verify clearances required and NEC ventilation requirements.

B. Install grounding electrode conductor, shown on the Drawings, for separately derived system to all available grounding electrodes, i.e., building service equipment, grounding conductor, building steel, cold water pipe, as applicable. A single connection to a new or existing "made electrode" isolated from the building service equipment ground will not be acceptable.

3.2 TESTING

A. After installation has been completed, Contractor shall conduct tests required by Section 16010, General Requirements, Electrical.

END OF SECTION

SECTION 16180

OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required, and install overcurrent protective devices as shown on the Drawings and as required to protect all circuits in strict accordance with applicable Electrical Code(s). Overcurrent protective devices may be required as a component of disconnect switches, transformers, motor starters, switchboards, motor control centers, panelboards or mechanical equipment.

1.2 QUALITY ASSURANCE

A. All overcurrent protective devices shall comply with applicable standards of the Underwriter's Laboratories. Circuit breakers and other devices shall be UL labeled.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit, in accordance with the requirements of Section 16010 the following materials and information:

1. A list of materials to be furnished, the name of the suppliers and the date of delivery of materials to the site.

2. Catalog data sheets and manufacturer’s information for all equipment covered by this Specification Section.

B. Submit name and qualifications of testing service when applicable.

PART 2 PRODUCTS

2.1 CIRCUIT BREAKERS AND MOTOR CIRCUIT PROTECTORS

A. Control Panel and Panelboard mounted molded case circuit breakers shall be of the proper type and rating for each application. They shall be molded case, thermal-magnetic, with inverse time characteristic response - temperature compensated. Motor circuit protectors shall be similar to circuit breakers except with adjustable magnetic trip and no thermal trip. The fault current interrupting rating shall not be less than that shown on the Drawings (30,000 ASYM minimum). Provide auxiliary contacts were shown on the Drawings.

1. Circuit breakers having a frame size of 225 Amps or less shall be molded case type with thermal magnetic non-interchangeable, trip free units. Thermal magnetic molded case circuit breakers shall be Square D, Eatonor equal. The interrupting capacity of all main, feeder and branch circuit breakers shall be rated for a minimum of 30,000 RMS symmetrical Amps at operating voltage.

2. Circuit breakers having a frame size of 250 to 400 Amps shall be molded case type with interchangeable thermal magnetic or electronic microprocessor based RMS trip elements. Thermal magnetic molded case circuit breakers shall be Square D, Eatonor equal. The interrupting capacity of all main, feeder and branch circuit breakers shall be rated for a minimum of 30,000 RMS symmetrical Amps at operating voltage.
3. Circuit breakers having a frame size of 450 to 800 Amps shall be molded case type with interchangeable electronic microprocessor based RMS trip elements. Elements shall include adjustable long time pick-up, long time delay, short time pick-up and instantaneous pick-up settings. Thermal magnetic molded case circuit breakers shall be Square D, Eaton or equal. The interrupting capacity of all main, feeder and branch circuit breakers shall be rated for a minimum of 30,000 RMS symmetrical Amps at operating voltage.
4. Circuit breakers feeding motors starters shall be molded case instantaneous only motor circuit protector unless shown otherwise on the Drawing. Motor circuit protectors shall be rated for 600 VAC. Motor circuit protectors shall be Square D, Eaton or equal. The interrupting capacity of all motor circuit protectors shall be rated for a minimum of 30,000 RMS symmetrical Amps at operating voltage. The CONTRACTOR is responsible to provide correct motor circuit protector size, trip rating and setting for all installed equipment.
5. Provide shunt trips where shown on the Drawings.

B. Panelboard circuit breakers shall be bolt on type unless noted otherwise. Multiple pole breakers shall be manufactured as a single unit. Use of "tandem" circuit breakers or "two in the space normally occupied by one" will not be acceptable. The fault current interrupting rating shall not be less than that shown on the Drawings (10,000 ASYM minimum).

C. Circuit Breakers shall be manufactured by Eaton, Square D or equal.

D. Enclosed circuit breakers shall be as indicated on the Drawings and as required by Section 16010. The enclosures shall have been manufactured specifically for the type of circuit breaker provided and shall be UL listed.

2.2 FUSES

A. Fuses shall be provided for all fuse holders as shown on the Drawings and specified herein. They shall be current-limiting, non-renewable as indicated on the Drawings - Fusetron or Limitron type manufactured by Bussman or equal. Provide 3 spare fuses for each size and class of fuse used.

PART 3 EXECUTION

3.1 INSTALLATION

A. Circuit breakers and fuses are to be installed in accordance with manufacturers' instructions. Fuses must seat solidly with all contact surfaces bearing evenly. Replace warped, weak, or broken fuse clamp terminals. Do not attempt to repair or bend back into position.

B. Enclosed circuit breakers are to be installed plumb and rigidly secured to structure or equipment with wood screws, bolts and expansion anchors, or machine bolts and locknuts as applicable. Nameplates shall be installed as indicated in Section 16010, General Requirements, Electrical.

C. Set adjustable breakers per the coordination study recommendations.

3.2 TESTING

A. After installation has been completed, CONTRACTOR shall conduct tests required by Section 16010, General Requirements, Electrical.

B. In addition, test all circuit breakers required to be tested by code. Provide the services of a qualified testing service.

END OF SECTION

SECTION 16262

AUTOMATIC TRANSFER SWITCH

PART GENERAL

1.1 SCOPE OF WORK

A. The work of this section consists of furnishing, installing, start-up and testing of an automatic transfer switch.

B. Furnish all required labor, materials, safety equipment, transportation, test equipment, incidentals and services to provide a complete and operational transfer switch as described in these Specifications, or required for fully operating facility.

C. Work includes that specified in Section 16010, General Requirements, Electrical.

D. The scope of work includes providing:

1. Installation of the complete transfer switch.

2. Submittal data and drawings.

3. Startup assistance.

4. Testing and training.

5. Operation and maintenance manuals.

6. Warranty of all components of the transfer switch.

1.2 QUALITY ASSURANCE

A. Section 16010 and manufacturers' printed recommendations. Unit shall meet requirements of UL 1008.

1.0 SUBMITTALS

A. Provide submittals and drawings as specified in Section 16010, General Requirements, Electrical.

1.4 OPERATION AND MAINTENANCE DATA

A. Provide operating instructions as specified in Section 16010, General Requirements, Electrical.

PART 2 PRODUCTS

2.1 GENERAL

A. The electrically operated, mechanically held, transfer switch shall be mounted and wired by the switchboard manufacturer as shown on the Drawings.

2.2 RATING AND PERFORMANCE

A. The transfer switch shall be 480 Volt, three phase, 60 hertz, three pole, with solid neutral operation in ambient temperatures of 40 to 100 degrees F. The transfer switches shall be rated for all classes of load, both inductive and non-inductive, at 600 Volts, and tungsten lamp load not to exceed 30 percent of the continuous rating at 600 Volts. The transfer switches shall be designed, built, and tested to close on an inrush current up to and including 20 times the continuous rating of the switch without welding or excessive burning of the contacts. The transfer switch shall be capable of 50 operations at 6 times the continuous rating and capable of enduring 6000 operations at two times rated current, at a rate of six per minute, without failure. The electrically operated transfer switch shall have a withstand current rating that is equal to or exceeds 30,000 Amperes RMS symmetrical at 480 Volts.

2.3 CONSTRUCTION

A. The switchboard enclosure shall house the transfer switch and control components.

B. The transfer switch shall be double throw, actuated by an electrical operator connected to the transfer mechanism. The transfer switch shall be rated 480 Volts, 3-phase, 3-pole with a solid neutral. The transfer switch shall have current ratings as shown on the Drawings.

1. Automatic transfer switch shall be manufactured ASCO 7000 Series.

2. The switch shall be rated for continuous duty and be inherently double-throw. The switch shall be mechanically interlocked to ensure only one of two possible positions; normal or emergency. The switch shall be suitable for use with standby engine-generator.

3. All main contacts shall be of silver composition. They shall be protected from arcing contacts. They shall be of the blow on configuration and of segmented construction in ratings of 600 Amperes and over. The operating time shall not exceed (1/6) of a second.

4. All contacts, springs, and control elements shall be conveniently removable from the front of the transfer switch without major disassembly of disconnection of power conductors.

5. The transfer switch shall be rated to withstand the rms symmetrical short circuit current available at the transfer switch terminals with the type of overcurrent protection shown on the Drawings.

6. The switch shall be factory assembled and completely tested before shipping.

C. The system shall be demonstrated by the factory authorized representative at the job site after installation. This shall include a simulated power failure and explanations of the operation to the DISTRICT's designated personnel.

2.4 MICROPROCESSOR BASED CONTROL PANEL

A. The control panels shall direct the operation of the transfer switch. The ATS panel's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent digital communications capability. The control panels shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the control panel to be disconnected from the transfer switch for routine maintenance.

B. The control panels shall be completely enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance Sensing and control logic shall be provided on plug-in printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.

C. ATS Voltage and Frequency Sensing

1. The voltage of each phase of the normal source shall be monitored, with pickup adjustable from 85% to 100% and dropout adjustable from 75% to 98% of pickup setting.

2. Single-phase voltage sensing of the emergency source shall be provided, with a pickup voltage adjustable from 85% to 100% and frequency sensing with pickup adjustable from 90% to 100%.

3. Repetitive accuracy of all settings shall be +/- 2% or better over an operating temperature range of -20°C to 70°C.

4. Voltage and frequency settings shall be field adjustable in 1% increments without the use of tools, meters or power supplies.

D. ATS Time Delays

1. A time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Adjustable from 0 to 3 seconds.

2. A time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.

3. A time delay shall be provided on retransfer to normal, adjustable from 0 to 30 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable. Also, provide bypass switch.

4. A time delay shall be provided on shutdown of engine generator for cool down, adjustable from 0 to 60 minutes.

E. Other Features

1. A set of DPDT gold-flashed contacts rated 10 Amps, 32 VDC and shall be provided for a low-voltage engine start signal with the ATS. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred. Also provide a "commit/no commit to transfer" selector switch to select whether the load should be transferred to the standby generator if the normal source restores before the generator is ready to accept the load.

2. A momentary-type test switch shall be provided to simulate a normal source failure.

3. Terminals shall be provided for a remote contact, which opens to signal the ATS to transfer to emergency and for remote contacts, which open to inhibit transfer to emergency and/or retransfer to normal.

4. Auxiliary contacts, rated 10 amps, 480VAC shall be provided consisting of one contact, closed when the switch is connected to normal source and one contact closed, when the switch is connected to emergency source. Provide auxiliary contacts with the ATS. These contacts will be wired to the PLC/RTU.

5. Indicating lights shall be provided, one to indicate when the switch is connected to normal source and one to indicate when the switch is connected to emergency source.

6. Terminals shall be provided to signal the actual availability of the normal and emergency sources, as determined by the voltage sensing pickup and dropout settings for each source.

7. NEMA Enclosure for enclosed switches per Specification Section 16010, General Electrical.

PART 3 EXECUTION

3.1 TRANSFER SWITCHES AND PANEL MOUNTING

A. Mount transfer switch in the motor control center line-up as shown on Drawings.

3.2 WIRING

A. Install wiring between generator breaker and automatic transfer switch in accordance with manufacturer's recommendations and as shown on the Drawings.

3.3 GROUNDING

A. Ground automatic transfer switch directly to the service entrance ground source in accordance with NEC.

3.4 WARRANTY

A. Provide a one (1) year warranty as specified in Section 16010, General Requirements, Electrical, subsection Warranty.

3.5 TESTING

A. After installation has been completed, CONTRACTOR shall conduct tests required by Section 16, General Requirements, Electrical.

END OF SECTION

SECTION 16400

GROUNDING SYSTEM

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Applicable provisions of Section 16010 are incorporated herein as though fully set forth at length.

1. Ground Power system, electrical equipment and raceway grounding and bonding, and specialized systems including testing.

B. Work Included: Furnish all labor, material, equipment, tools and services necessary for the installation, connection and testing of all grounding as specified herein and as shown on the Drawings.

1.2 STANDARDS

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

1. B228 Copper Clad Steel Conductors Specification

2. D178 Specifications for Rubber Insulating Matting

B. National Electric Code (NEC)

C. International Electrical Testing Association (NETA) Publication:

1. ATS - Acceptance Testing Specifications for Electrical Equipment Power Systems

1.3 SUBMITTALS

A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Section 16010.

B. Manufacturer's product data for the following:

1. Connection methods and details.
2. Ground Rods.
3. Ground rod wells.

1.4 QUALITY ASSURANCE

A. Comply with the following codes and standards, and section 16010:

1. IEEE 81- Recommended guide for measuring ground resistance and potential gradients in the earth.

2. NEMA.

3. UL Listings.

4. MIL Handbook 419.

PART 2 MATERIALS

2.1 GENERAL SYSTEM DESCRIPTION

A. The grounding systems shall consist of the ground rods, grounding conductors, ground bus, ground fittings and clamps, and bonding conductors to water piping and structural steel as shown on the Drawings. One system shown provides service and separately derived system grounds. A second system is an electronic ground system to provide for the discharge of static electricity. All are bonded together.

B. Ground all electrical equipment, conduits, supports, cabinets, and switchgear in accordance with National Electrical Code and as shown on the drawings, the intent being a complete system ground and equipment ground.

2.3 SYSTEM COMPONENTS

A. Ground Rods: Ground rods shall be cone pointed copper clad Grade 40 HS steel rods conforming to ASTM B228. The welded copper encased steel rod shall have a conductivity of not less than 27% of pure copper. Rods shall be not less than 3/4-inch in diameter and 10 feet long, unless otherwise indicated. The manufacturer's trademark shall be stamped near the top.

B. Ground Conductors: Buried conductors shall be medium-hard drawn bare copper; other conductors shall be soft drawn copper. Sizes over No.6 AWG shall be stranded. Coat all ground connections except the exothermic welds with electrical joint compound, non-petroleum type, UL listed for copper and aluminum applications.

C. Ground Connections: Connection to ground rods and buried connections shall be by exothermic weld. Lugs for attachment of cables to steel enclosures shall be of the binding post type with a 1/2-13NC stud. Each post shall accommodate cables from #4 AWG to #3/0 AWG.

D. Ground Rod Boxes: Boxes shall be a 9-inch-diameter precast concrete unit with hot-dip galvanized traffic covers. Units shall be 12-inches deep. Covers shall be embossed with the wording "Ground Rod."

E. Ground rod wells shall be 8” inch diameter constructed of reinforced concrete with a reinforced concrete removable cover stamped “GROUND” as manufactured by Christy or equal.

F. Ground Bus: Ground bus shall be a high conductivity copper alloy strap measuring 3/16-inch by 3/4-inch and of lengths as shown on the Drawings. Bus shall be predrilled and tapped to accept 8-32" brass machine screws on 12-inch centers or with greater density if required.

PART 3 EXECUTION

3.1 INSTALLATION

A. Ground all equipment for which a ground connection is required per NEC whether or not the ground connection is specifically shown on the Drawings.

B. Where mechanical lugs are not welded or fastened with threaded bolt, surfaces shall be thoroughly cleaned and paint scraped to bare metal before connections are made to insure good metal-to-metal contact.

C. Grounding conductors shall be so installed as to permit shortest and most direct path from equipment to ground. Ground connections shall be accessible for inspection and made with approved solderless connections braced (or bolted) to the equipment or structure to be grounded.

D. An equipment grounding conductor must be installed in each conduit with power conductors or, in the case of multi-conductor cable, run inside the sheath.

E. Where generators and transformers are indicated on the drawings to be grounded solidly to a separate grounding electrode located at the equipment in addition to the ground connection, this grounding electrode shall be bonded to the system ground through the equipment grounding conductor(s) and/or a separate grounding conductor as indicated on the drawings.

F. A main system ground, bare copper conductors, size as indicated, shall be run in PVC conduit from the pedestal to a ground point outside the pad and an electrode ground under the pad as indicated on the drawings. This ground shall be extended to metallic water piping.

G. Connections to ground rods shall be as noted on Drawings or be exothermically welded. Ground rod connections shall be in a ground rod well for inspection purposes.

H. All bonds between the grounding electrode conductors and the grounding electrodes must be accessible for inspection and routine maintenance. No buried ground connections (except rebar bonds) shall be accepted.

I. All enclosure doors with 120 VAC mounted devices shall be bonded to the enclosure ground bus.

J. Where ground rods must be driven to depths over 8 feet, increase rod diameter used, sufficiently to prevent the rod from bending or being damaged.

K. All direct buried conductors shall be minimum of 30” below grade.

L. Bond metallic water piping at its entrance into each building. Ground separately derived electrical system neutrals to the metallic water piping in addition to the system driven ground, per NEC requirements.

M. Provide a ground wire in every conduit carrying a circuit of over 50 volts to ground.

N. Make embedded or buried ground connections, taps and splices with exothermic welds. Coat ground connections.

O. Effectively bond structural steel for buildings to the grounding system using exothermic welds.

3.2 TESTING

A. Conduct ground resistance tests using a ground megohmmeter with a scale reading of 25 ohms maximum. Resistance between ground and absolute earth shall not exceed 25 ohms and shall be measured using the fall of potential method with a three or four terminal ground resistance tester. A minimum of ten (10) ground resistance tests shall be measured at 30-foot intervals from the service-grounding electrode.

B. The test results shall be plotted on a curve and submitted in the report. The ground resistance test shall be conducted in the presence of the DISTRICT before the equipment is placed in operation. Use of salts, water or compounds to attain the specified ground resistance is not acceptable.

C. Test methods shall conform to NETA Standard ATS using the three electrode method. Conduct tests only after a period of not less than 48 hours of dry weather.

D. Furnish to the DISTIRCT a test report with recorded data of each ground rod location included on a drawing with date of test, weather conductions and the measured resistance.

END OF SECTION

SECTION 16450

UTILITY EQUIPMENT

PART 1 GENERAL

1.1 DESCRIPTION

A. Provide equipment as described in the Specifications and shown on the Drawings. Provide and install all service entrance equipment, cabinets, vaults, pads, pull boxes, raceways, risers, supporting structures, conduit, concrete encasement, pullropes and conductors as required by the serving utilities.

B. Submit equipment and devices to the utility in compliance with their requirements.

C. Review and conform to all Utility standards. See;

https://www.tdpud.org/home/showpublisheddocument?id=8453

D. Provide temporary power during construction. Pay for equipment rental, fuel, power, etc. Remove temporary facilities after completion of construction.

1.2 QUALITY ASSURANCE

A. All work and material provided shall be in strict accordance with each utility company's rules, requirements, and standards, but in no case less than the requirements of this Specification. Coordinate all work, outages, etc., with the various utility companies, the District and others to prevent unnecessary delays in the progress of construction.

B. Coordinate work with the DISTRICT, UTILITY and the Utility Engineer.

1.0 SUBMITTALS

A. Submit material or equipment data in accordance with the Specification Sections 01300, Submittals and 16010, General Requirements, Electrical.

B. Submit all utility equipment to UTILITY for review and approval.

PART 2 PRODUCTS

2.1 MATERIALS

A. All materials shall be as specified by the utilities, but in no case less than the requirements of this Specification.

B. Where specifically required by the utility companies, provide concrete encasement or sand bed with geotextile grid envelope in utility trenches per their standards.

C. The metering equipment shall be provided as shown on the Drawings and shall be rated for 480 volts, 3 phase, 4 wire with current rating as shown on the Drawings and 22 KAIC rating, unless shown otherwise. The metering equipment shall be UL listed and shall be equipped with a metering socket and shall meet the requirements of the serving utility. Provide with main service disconnect breaker. Metering equipment shall be manufactured by Cutler-Hammer U227, Square D or equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation of all structures and equipment shall be in strict accordance with utility company standards.

B. Brady "Identoline" identification tape shall be laid in Utility trenches. At a depth of 12" below finished grade and at least 6" above installed equipment, lay a 6" wide yellow warning tape on the compacted backfill for the full length of the trench. Do not stretch the tape. Use Brady "Identoline" stating: "CAUTION BURIED ELECTRICAL LINE". Installation of identification tape under building slabs is not required.

C. Trenching and backfill shall be accomplished in accordance with utility requirements and the requirements of this specification. Coordinate raceway placement, use of conduit spacers, installation of sand bed, geotextile grid envelope and backfill, electronic markers, etc. with applicable utility.

3.2 TESTING

A. After installation has been completed, CONTRACTOR shall conduct tests required by Section 16010, General Requirements, Electrical.

END OF SECTION

SECTION 16930

CONTROL PANELS & PROGRAMMABLE LOGIC CONTROLLERS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The CONTRACTOR shall provide and install the control panel enclosure and backpan including all labor, materials, equipment and incidentals.
   1. The CONTRACTOR shall coordinate the delivery of the backpan to the DISTRICT for construction of the internal components and wiring on the back pan. The DISTRICT will return the completed backpan to the CONTRACTOR on site.
   2. The CONTRACTOR shall re-mount the control panel backpan in the control panel enclosure and install all interconnection wiring as shown on bid documents and the loop drawings.
   3. The CONTRACTOR shall terminate all the interconnection conductors and cabling in the control panel on the DISTRICT provided terminals on the backpan per the loop drawings. The CONTRACTOR is responsible for testing and proving the interconnection wiring as shown in the loop drawings and Bid Documents.
   4. Loop drawings are provided as an appendix herein as scope description of CONTRACTOR effort for cable and conductor, installation and termination as well as testing coordination with the DISTRICT.
   5. The CONTRACTOR is also responsible for providing and installing the communications enclosure above the control panel. The communication enclosure will include CONTRACTOR provided fiber management
   6. The CONTRACTOR shall extend an existing 12 fiber cable from the current location down the street to the communications enclosure via CONTRACTOR installed conduit and contractor provided cable and splices and other components required to complete the fiber-optic communications/network system. The CONTRACTOR shall test the fiber-optic cables and provide a test report.
   7. The DISTRICT will be field mounting additional equipment in the communication enclosure that will require coordination.
   8. See also notes on DRAWING E05.

B. The CONTRACTOR shall meet with the DISTRICT to discuss submittals.
   1. The CONTRACTOR shall review the DISTRICT provided submittals and be prepared to comment on them to minimize field issues.

C. The CONTRACTOR shall assist the DISTRICT with testing, startup and training.

D. The CONTRACTOR shall meet with the DISTRICT to discuss the scheduling, work plan, shutdowns, field conditions, testing, schedule and any other relevant issues related to the installation of the control panel and the communications enclosure.
   1. Attend a four-hour meeting.

2. Coordinate activities with DISTRICT (Control System Engineer, SCADA programmer and Electrician).

E. THE DISTRICT will take the lead in testing the control panel once it is mounted, powered-up and interconnected with the Meter/Main, Panelboards, Automatic Transfer Switch, Pump Control Panel, instruments and other devices as shown in the BID DOCUMENTS and loop drawings and all interconnections have been tested.
1. The DISTRICT will provide RTU/PLC and SCADA programming.

1.2 SUBMITTALS

A. Review vendor submittals provided by the DISTRICT. Meet with the DISTRICT during the submittal process. Review the loop drawings in the appendix of this section.

1.4 WARRANTY

A. Guarantee all installation work for one year from date of final acceptance against all defects.

PART 2 PRODUCTS

2.1 CONTROL PANEL ENCLOSURE

A. Review vendor submittals and loop drawings provided by the DISTRICT.

2.2 PROGRAMMABLE LOGIC CONTROLLER

A. Review submittals and programming provided by the DISTRICT.

B. The preliminary I/O list:

I/O List Layout

DI

0 120 Volt OK
1 24 Volt Okay
2 240 Volt Okay
3 UPS Okay
4 Phase monitor
5 Intrusion
6 Tank Intrusion
7 Fire Alarm
8 T.S. on emergency
9 T.S. on normal
10 Gen Running
11 Man Down

12 Flood Switch

DO

1 Intrusion light
2 Feature 17

AI

0 Room Temp
1 In Ground Level
2 In Tank Level
3 Inlet pressure
4 Outlet pressure
5 Flow meter/Hart Card

AO

1 N/A

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation shall be in accordance with the DISTRICT and manufacturer's instructions and located as shown on the Drawings. The CONTRACTOR shall be responsible for coordinating the equipment, performing the installation in a timely manner, and assuring a fully operable and function-tested system.

B. Reference the loop drawings, P&ID and the conduit/conductor schedule for an estimate of the number of terminations required in the control panel and communication enclosure.

C. Mount the enclosures to the wall and extend all conduits to the enclosure shown in the conduit/conductor schedule in the Bid Documents.

3.2 TESTS

A. Testing shall be provided as described in herein and Specification Section 16010, General Requirements, Electrical.

B. Do not energize the control panel and PLC equipment before the DISTRICT has checked the installation.

END OF SECTION

APPENDIX TO TECHNICAL SPECIFICATION SECTION 16930

LOOP DIAGRAMS

SHEET INDEX

SHEET #	TAG NO.	PLC	DESCRIPTION
4	TBD	RTU PANEL	RTU INTERNAL I/O
5	TBD	RTU PANEL	BUILDING INTRUSION
6	TBD	RTU PANEL	TANK INTRUSION SWITCH
7	TBD	RTU PANEL	FIRE ALARM
8	TS-TBD	RTU PANEL	TRANSFER SWITCH
9	TBD	RTU PANEL	GENERATOR
10	TBD	RTU PANEL	MAN DOWN
11	TT-TBD	RTU PANEL	ROOM TEMPERATURE
12	LIT-TBD	RTU PANEL	IN GROUND LEVEL
13	LIT-TBD	RTU PANEL	IN TANK LEVEL
14	PIT-TBD	RTU PANEL	INLET PRESSURE
15	PIT-TBD	RTU PANEL	OUTLET PRESSURE
16	FIT-TBD	RTU PANEL	FLOW METER
17	TBD	RTU PANEL	GRUNDFOS PUMP CONTROLLER
18	AIT-TBD	RTU PANEL	CHLORINE SENSOR/RESIDUAL
19	AIT-TBD	RTU PANEL	IN TANK CHLORINE LEVEL SONAR

SHEET NUMBER
GTH-1

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: SHEET INDEX
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. i-1
SHEET 1 OF 19

IO LIST

DEVICE TAG	ADDRESS	I/O DESCRIPTION	RACK	SLOT
TBDTBD	0.3.0	TBD 120 VOLT OK	RACK 0	SLOT 3
TBDTBD	0.3.1	TBD 24 VOLT OK	RACK 0	SLOT 3
TBDTBD	0.3.2	TBD 240 VOLT OK	RACK 0	SLOT 3
TBDTBD	0.3.3	TBD UPS BATTERY OK	RACK 0	SLOT 3
TBDTBD	0.3.4	TBD PHASE MONITOR OK	RACK 0	SLOT 3
TBDTBD	0.3.5	TBD BUILDING INTRUSION SWITCH	RACK 0	SLOT 3
TBDTBD	0.3.6	TBD TANK INTRUSION SWITCH	RACK 0	SLOT 3
TBDTBD	0.3.7	TBD FIRE ALARM	RACK 0	SLOT 3
TSTBD	0.3.8	TS-TBD TRANSFER SWITCH ON EMERGENCY	RACK 0	SLOT 3
TSTBD	0.3.9	TS-TBD TRANSFER SWITCH ON NORMAL	RACK 0	SLOT 3
TBDTBD	0.3.10	TBD GENERATOR RUN	RACK 0	SLOT 3
TBDTBD	0.3.11	TBD MAN DOWN	RACK 0	SLOT 3
TBDTBD	0.5.0	TBD INTRUSION LIGHT	RACK 0	SLOT 5
TSTBD	0.5.7	TS-TBD REMOTE TRANSFER TO EMERGENCY	RACK 0	SLOT 5
FITTBD	0.7.0	FIT-TBD FLOW METER	RACK 0	SLOT 7
TTTBD	0.7.1	TT-TBD ROOM TEMPERATURE	RACK 0	SLOT 7
LITTBD	0.7.2	LIT-TBD IN GROUND LEVEL	RACK 0	SLOT 7
LITTBD	0.7.3	LIT-TBD IN TANK LEVEL	RACK 0	SLOT 7
PITTBD	0.7.4	PIT-TBD INLET PRESSURE	RACK 0	SLOT 7
PITTBD	0.7.5	PIT-TBD OUTLET PRESSURE	RACK 0	SLOT 7
AITTBD	0.7.6	AIT-TBD CHLORINE SENSOR/RESIDUAL	RACK 0	SLOT 7
AITTBD	0.7.7	AIT-TBD IN TANK CHLORINE LEVEL SONAR	RACK 0	SLOT 7

SHEET NUMBER
GTH-2

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: IO LIST
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

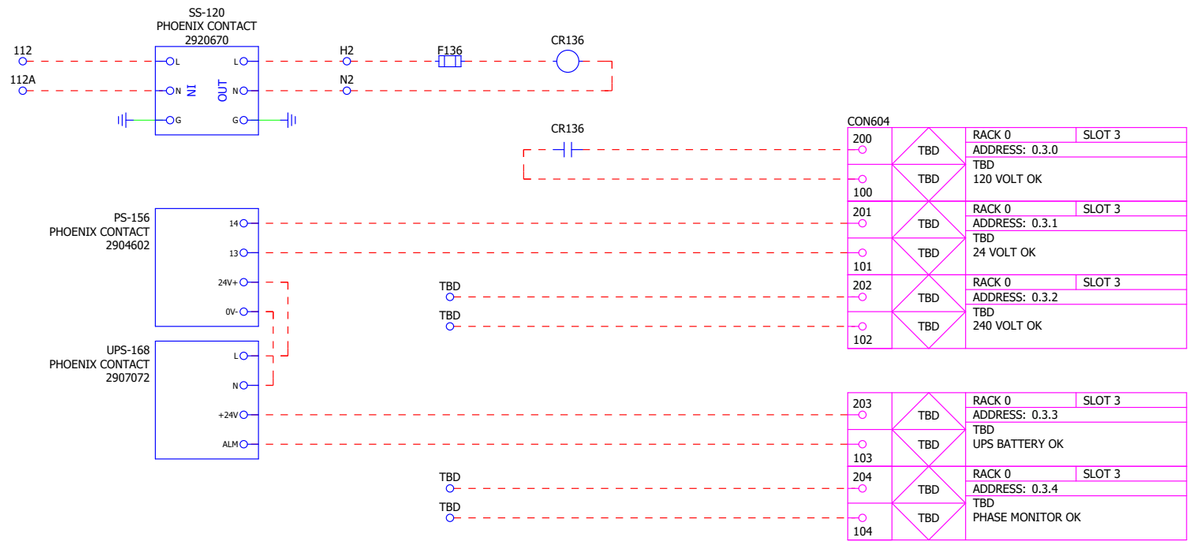
PROJECT NO N26005
TAG NO. IO-1
SHEET 2 OF 19

CONDUIT SCHEDULE

			CONDUIT		POWER			SIGNAL/CONTROL			DATA		REMARKS
CONDUIT	FROM	TO	QTY	SIZE	QTY	SIZE	SIZE	QTY	SIZE	TYPE	QTY	SIZE	
C01	REMOTE TELEMETRY UNIT	EXISTING WATER TANK	3	2"				1	4C#18	TSP			
C02	REMOTE TELEMETRY UNIT	STANDBY DIESEL GENERATOR CONTROL PANEL	1	1"				4	#14	THHN			
C04	REMOTE TELEMETRY UNIT	SES INTEGRATED SWITCHBOARD AUTOMATIC TRANSFER SWITCH	1	3/4"				6	#14	THHN			
C06	REMOTE TELEMETRY UNIT	COMMUNICATIONS CABINET	1	2"							1	CAT5e/6	
C09	REMOTE TELEMETRY UNIT	BUILDING INTRUSION SWITCH	1	3/4"				2	#14	THHN			
C19	REMOTE TELEMETRY UNIT	ROOM TEMPERATURE SENSOR	1	3/4"				1	#18	TSP			
C20	REMOTE TELEMETRY UNIT	FLOW METER	1	1"				1	#18	TSP			
C22	COMMUNICATIONS CABINET	PUMP CONTROLLER	1	3/4"							1	CAT5e/6	RED
C25	REMOTE TELEMETRY UNIT	BUILDING INTRUSION SWITCH	1	3/4"				2	#14	THHN			
C26	REMOTE TELEMETRY UNIT	INLET PRESSURE	1	1"				1	#18	TST			
C27	REMOTE TELEMETRY UNIT	OUTLET PRESSURE	1	1"				1	#18	TST			
C29	REMOTE TELEMETRY UNIT	FIRE ALARM	1	3/4"				4	#14	THHN			
C30	REMOTE TELEMETRY UNIT	MAN DOWN	1	3/4"				2	#14	THHN			
C31	REMOTE TELEMETRY UNIT	IN GROUND LEVEL	1	2"				1	#18	TSP			
C32	REMOTE TELEMETRY UNIT	CHLORINE SENSOR/RESIDUAL	1	1"				1	#18	TSP			
C33	REMOTE TELEMETRY UNIT	IN TANK CHLORINE LEVEL SONAR	1	1"				1	#18	TSP			
L12	LP1	FLOW METER	1	1"	2	#12	#12						
L14	LP1	CHLORINE SENSOR/RESIDUAL	1	1"	2	#12	#12						
L15	LP1	IN TANK CHLORINE LVEL SONAR	1	1"	2	#12	#12						
P07	SES INTEGRATED SWITCHBOARD DISTRIBUTION SECTION	PUMP CONTROLLER	1	3"	2	#500	1/0						

SHEET NUMBER
GTH-3

RTU PANEL



NOTE:
1. DETAILS SUBJECT TO CHANGE
2. DEVICE MODEL NO. AS PROVIDED IN LOOP DETAILS OR APPROVED EQUAL.

SHEET NUMBER
GTH-4

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	120 VOLT OK	PHOENIX CONTACT	SFP1-10/120AC	N/A	DI	N/A	120VAC	N/A	N/A	N/A	TBD	TBD
TBD	24 VOLT OK	PHOENIX CONTACT	2904602	N/A	DI	N/A	24VDC	N/A	N/A	N/A	TBD	TBD
TBD	240 VOLT OK	TBD	TBD	N/A	DI	N/A	240VAC	N/A	N/A	TBD	TBD	TBD
TBD	UPS BATTERY OK	PHOENIX CONTACT	2907072	N/A	DI	N/A	240VAC	N/A	N/A	N/A	TBD	TBD
TBD	PHASE MONITOR OK	TBD	TBD	N/A	DI	N/A	N/A	N/A	N/A	N/A	N/A	TBD

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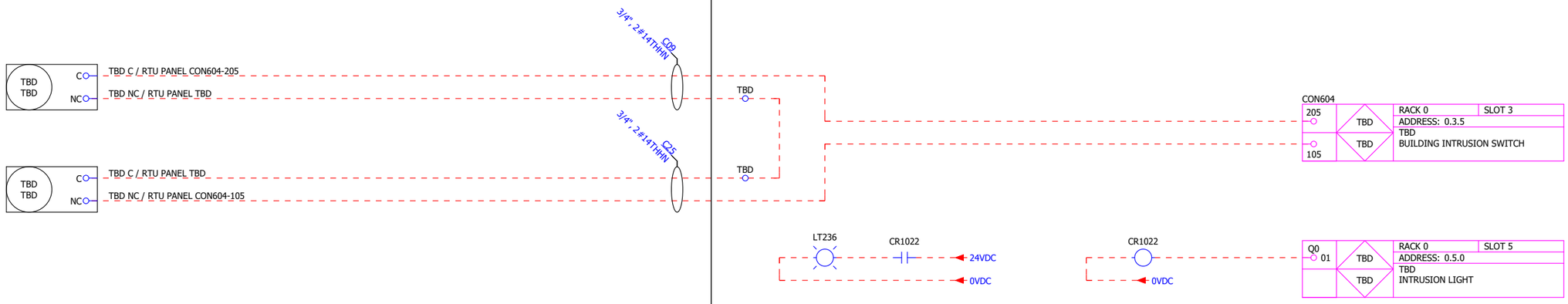
PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: RTU INTERNAL I/O
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. TBD
SHEET 4 OF 19



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-5

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	BUILDING INTRUSION SWITCH	INTERLOGIX	DOOR MAGNET OR APPROVED EQUAL	TBD	DI	N/A	N/A	N/A	N/A	N/A	TBD	TBD
TBD	BUILDING INTRUSION LIGHT	IDEC	APD122DNUR OR APPROVED EQUAL	TBD	DO	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: BUILDING INTRUSION
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. TBD
SHEET 5 OF 19

FIELD

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-6

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	TANK INTRUSION SWITCH	SENTROL	151/153 OR APPROVED EQUAL	TBD	DI	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

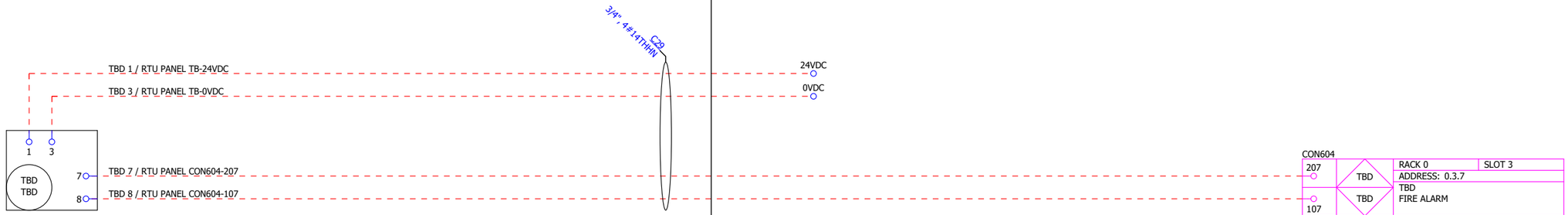
DRAWING TITLE / DESCRIPTION: TANK INTRUSION SWITCH
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. TBD
SHEET 6 OF 19

FIELD

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-7

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	FIRE ALARM	SYSTEM SENSOR	4WTR-B OR APPROVED EQUAL	TBD	DI	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS

CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: FIRE ALARM

PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

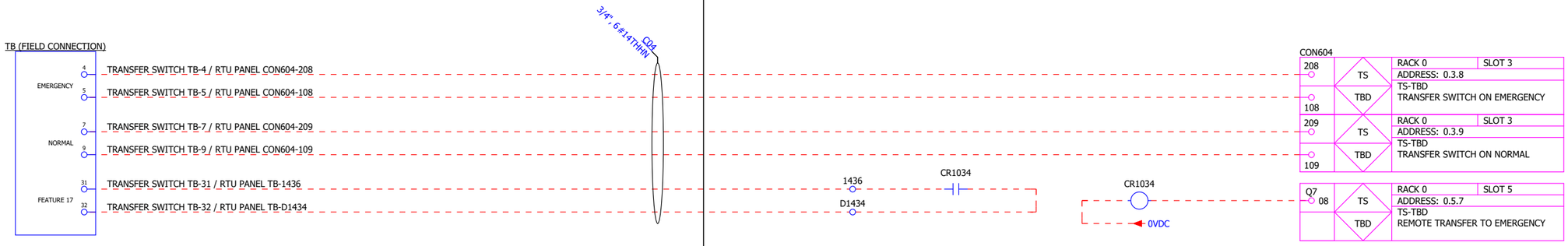
PROJECT NO N26005

TAG NO. TBD

SHEET 7 OF 19

TRANSFER SWITCH

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-8

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TS-TBD	TRANSFER SWITCH	TBD	TBD	TBD	DI	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS

CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: TRANSFER SWITCH

PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005

TAG NO. TS-TBD

SHEET 8 OF 19

FIELD	RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-9

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	GENERATOR	TBD	TBD	TBD	DI	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: GENERATOR
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. TBD
SHEET 9 OF 19



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-10

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	MAN DOWN	TBD	TBD	TBD	DI	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

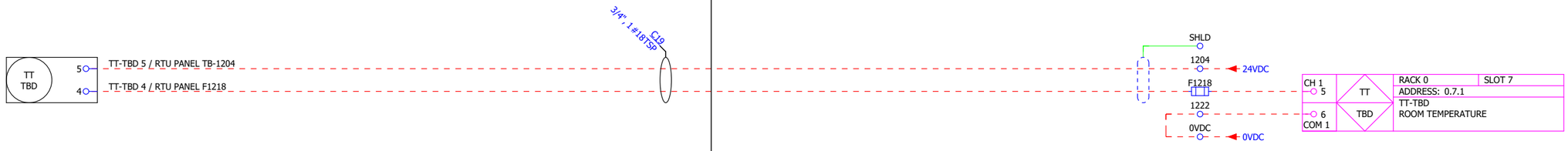
DRAWING TITLE / DESCRIPTION: MAN DOWN
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. TBD

FIELD

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-11

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TT-TBD	ROOM TEMPERATURE	PYROMATION	SERIES 440 OR APPROVED EQUAL	TBD	AI	4-20mA	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS

CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: ROOM TEMPERATURE

PANEL NAME: RTU PANEL

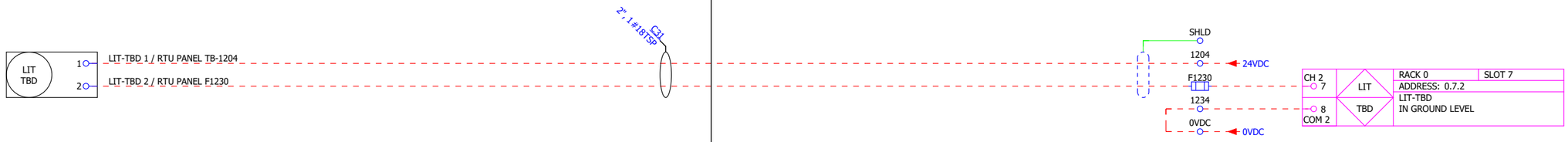
	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005

TAG NO. TT-TBD

FIELD

RTU PANEL



NOTE:
1. DETAILS SUBJECT TO CHANGE
2. INSTRUMENT MODEL NO. AS PROVIDED IN LOOP DETAILS OR APPROVED EQUAL.

SHEET NUMBER
GTH-12

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
LIT-TBD	IN GROUND LEVEL	IFM ELECTRONIC	PX3226/PA-003 PRBN14-AZVG/US	TBD	AI	4-20mA	N/A	0-30 PSI	TBD	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

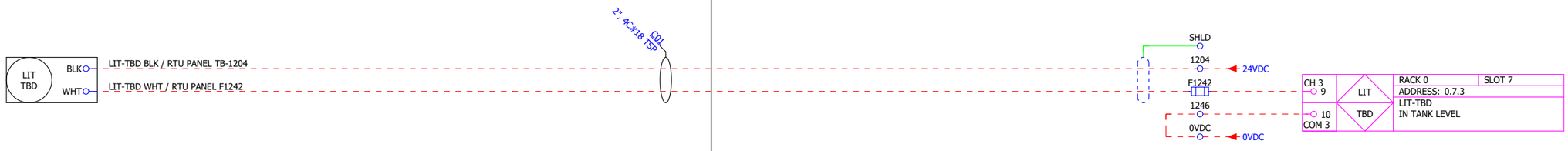
DRAWING TITLE / DESCRIPTION: IN GROUND LEVEL
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. LIT-TBD

FIELD

RTU PANEL



NOTE:
1. DETAILS SUBJECT TO CHANGE
2. INSTRUMENT MODEL NO. AS PROVIDED IN LOOP DETAILS OR APPROVED EQUAL.

SHEET NUMBER
GTH-13

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
LIT-TBD	IN TANK LEVEL	KELLER	0407.04507.021311.13	TBD	AI	4-20mA	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

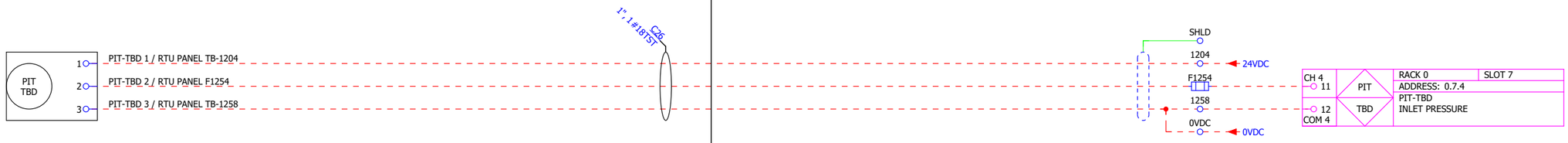
DRAWING TITLE / DESCRIPTION: IN TANK LEVEL
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. LIT-TBD
SHEET 13 OF 19

FIELD

RTU PANEL



NOTE:
1. DETAILS SUBJECT TO CHANGE
2. INSTRUMENT MODEL NO. AS PROVIDED IN LOOP DETAILS OR APPROVED EQUAL.

SHEET NUMBER
GTH-14

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
PIT-TBD	INLET PRESSURE	IFM ELECTRONIC	PG 2453 / PG025-RB-12-MFRKG/US	TBD	AI	4-20mA	N/A	N/A	N/A	N/A	TBD	TBD
PIT-TBD	INLET PRESSURE	IFM ELECTRONIC	EVT006/ADOAH040VAS0025	TBD	N/A	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

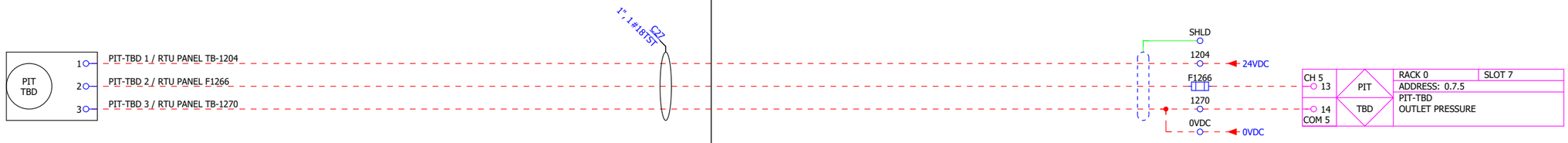
DRAWING TITLE / DESCRIPTION: INLET PRESSURE
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. PIT-TBD

FIELD

RTU PANEL



NOTE:
1. DETAILS SUBJECT TO CHANGE
2. INSTRUMENT MODEL NO. AS PROVIDED IN LOOP DETAILS OR APPROVED EQUAL.

SHEET NUMBER
GTH-15

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
PIT-TBD	OUTLET PRESSURE	IFM ELECTRONIC	PG 2453 / PG025-RB-12-MFRKG/US	TBD	AI	4-20mA	N/A	N/A	N/A	N/A	TBD	TBD
PIT-TBD	OUTLET PRESSURE	IFM ELECTRONIC	EVT006/ADOAH040VAS0025	TBD	N/A	N/A	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

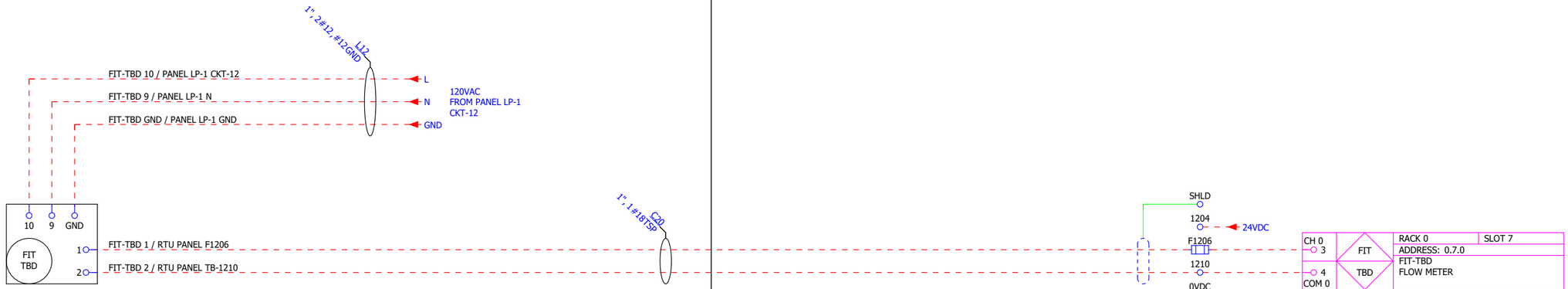
DRAWING TITLE / DESCRIPTION: OUTLET PRESSURE
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. PIT-TBD

FIELD

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-16

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
FIT-TBD	FLOW METER	ROSEMOUNT	8750 OR APPROVED EQUAL	TBD	AI	4-20mA	120VAC	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS

CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: FLOW METER

PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

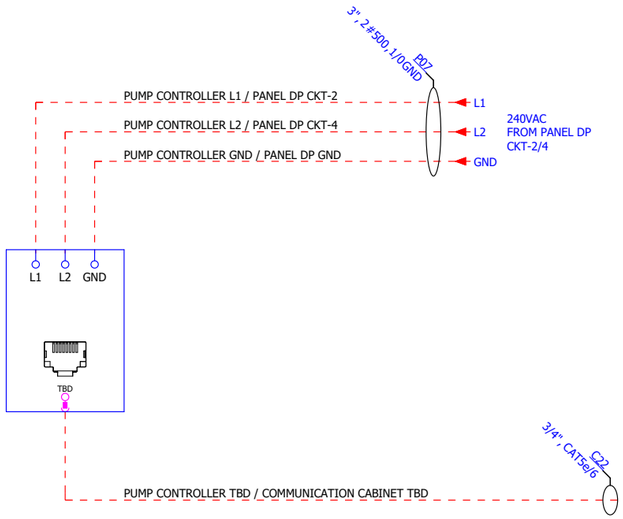
PROJECT NO N26005

TAG NO. FIT-TBD

GRUNDFOS PUMP CONTROLLER

COMMUNICATION CABINET

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-17

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
TBD	GRUNDFOS PUMP CONTROLLER	GRUNDFOS	CIM 500 OR APPROVED EQUAL	TBD	DO/AO/COM	N/A	240VAC	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS

CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: GRUNDFOS PUMP CONTROLLER

PANEL NAME: RTU PANEL

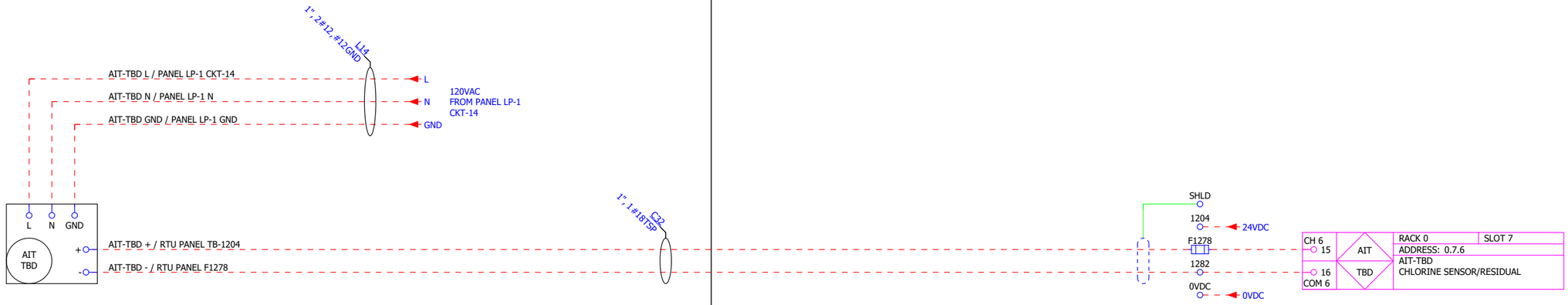
	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005

TAG NO. TBD

FIELD

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-18

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
AIT-TBD	CHLORINE SENSOR/RESIDUAL	TBD	TBD	TBD	AI	4-20mA	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS

CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: CHLORINE SENSOR/RESIDUAL

PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005

TAG NO. AIT-TBD

FIELD

RTU PANEL



NOTE: DETAILS SUBJECT TO CHANGE

SHEET NUMBER
GTH-19

TAG NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SPEC. NO.	IO TYPE	SIGNAL DETAIL	REQ. PWR SUPPLY	INSTRUMENT RANGE	CALIBRATED RANGE	COMMENTS	LOCATION	DRAWINGS
AIT-TBD	IN TANK CHLORINE LEVEL SONAR	TBD	TBD	TBD	AI	4-20mA	N/A	N/A	N/A	N/A	TBD	TBD

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PROJECT DESCRIPTION: SITZMARK HYDROPNEUMATIC PS
CUSTOMER: TRUCKEE DONNER PUD

REV.	MODIFICATION	NAME	DATE

DRAWING TITLE / DESCRIPTION: IN TANK CHLORINE LEVEL SONAR
PANEL NAME: RTU PANEL

	NAME	DATE
DESIGNED BY:	GS	03/31/2026
DRAWN BY:	YG	03/31/2026
APPROVED BY:		

PROJECT NO N26005
TAG NO. AIT-TBD
SHEET 19 OF 19

Division 17 – Instrumentation

SECTION 17010

INSTRUMENTATION

PART 1 GENERAL

1.1 DESCRIPTION

A. Provide and install all instruments, devices, wiring, terminal blocks, accessories, and enclosures as specified herein and as shown on Contract Drawings for the instrumentation system. The Contract Documents are intended as an outline for the work and are descriptive of the type of hardware and software configuration to be provided. Any error or omission of detail shall not relieve the CONTRACTOR from the obligations there under to provide and install in correct detail any and all materials necessary for a complete operational instrumentation system, at no additional cost to the DISTRICT.

B. Work includes that specified in Division 16, Electrical.

C. The major components for in the instrumentation scope of work, which includes both the furnishing and installation of:

1. Flowmeter

2. Pressure Transmitter

3. Pressure Gauges

4. Accessories

D. The contract documents are not intended to cover every detail of materials, configuration, or construction. The CONTRACTOR shall furnish all tools, temporary utilities, materials, setup, parts, labor, and other incidentals necessary to fully complete the entire work, whether or not said details are particularly shown or specified, all at no additional cost to the DISTRICT.

E. Coordinate the installation of instruments and accessories in the control panel as shown on the Drawings.

1.2 RELATED WORK

A. Installation of primary elements which require placement into or taps off of a process flow line is included in Mechanical specifications. Electrical equipment interface, control panels, conduit and cable for instrumentation is covered in Division 16 Electrical.

1.3 QUALITY ASSURANCE

A. All equipment shall comply with applicable standards of the Underwriter's Laboratories, Inc.

B. Provide enclosures suitable for the type of location in which they are located per Specification Section 16010, General Requirements Electrical.

1.4 SUBMITTALS

A. Provide submittals and drawings as specified in Section 16010, General Requirements, Electrical.

1.5 OPERATION AND MAINTENANCE MANUALS

A. Provide operating instructions as specified in Section 16010, General Requirements, Electrical.

B. Provide a set-up sheet for all programmable instruments based upon parameters and setpoints from start-up activities.

PART 2 PRODUCTS

2.1 GENERAL

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 plant. 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, 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 establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are approved by the DISTRICT prior to installation.

D. The equipment specifications have been prepared on the basis of the equipment first named in the Specifications. The CONTRACTOR 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 the DISTRICT, to meet Specifications.

E. 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.

F. Signal transmission from remote or field electric and electronic devices shall be 4-20 mA, powered 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.

G. 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.

2.2 PRESSURE TRANSMITTER (PIT/LIT)

A. The pressure transmitters shall be two wire 4-20 mA linear output device proportional to the applied pressure. The transmitters shall include independent zero and span adjustments, and adjustable dampening. Process wetted materials shall be stainless steel and the process Instrumentation connection shall be IFM part number UP0021 (female). Enclosure shall be NEMA 4X.

B. The pressure transmitters shall be setup with the proper span and zero suppression adjustments.

C. Pressure transmitters shall have a range of 0-25 atmospheres. Accuracy shall be 0.15% or better.

D. The pressure transmitters shall be as manufactured by IFM part number PG2453 mounted on wall with bracket as detailed.

2.4 PRESSURE SWITCH

A. Each pressure switch shall be SPDT rated minimum of 15 amps @ 120VAC. Pressure switch shall consist of a pressure sensing mechanism and the switch itself enclosed in a NEMA rated 304 stainless steel housing. Pressure switch shall be diaphragm type with stainless steel wetted parts and mechanical snap action switch. Switch shall have two setpoint adjustments (trip and reset setpoints) with setpoint indicator calibrated in engineering units. Pressure switch shall be UL listed. The pressure switch shall be

Mercoid D Series with Snap Action Switch, or equal. No mercury pressure switches shall be acceptable.

2.5 PRESSURE GAUGE

A. The pressure gauge shall be 1% accurate with C-type bourdon tube. The bourdon tube, socket and connection tube of the gauge shall be 316 stainless steel. The case and bezel ring shall be constructed of type 304 stainless steel. The dial shall be 4" in diameter with a black pointer and a white gauge face with black print. The gauge shall be filled with liquid glycerin. A bottom mount process connection shall include a snubber as a separate component. The process connection shall be 1/2" stainless steel. The pressure gauge shall display a pressure range of 0-150 psi. The pressure gauge shall be Ashcroft 1009, or equal.

2.6 FLOW METER (FE/FIT)

A. The magnetic flowmeter Flowmeter system shall include flowtube installed and grounded within the building. Flowtube shall be NEMA 4X rated for wall mount. Remote flow transmitter shall be mounted with PLC/RTU Panel.

B. Flange Type Magnetic Flowmeter Element: In-line flow element with no constrictions in flow of fluid through meter consisting of metallic tube with ANSI B16.5, Class 150, flanged ends for diameter and bolt drilling pattern. Flange material shall be carbon steel. Provide 316L stainless steel grounding rings. Provide with cable length to route from flowtube to transmitter without splicing in conduit (100 feet minimum length).

C. Electrode and Liner Materials: Fully compatible with process fluid. Liner shall be hard polyurethane. Electrodes shall be 316 stainless steel. Provide NSF drinking water certification.

D. Remote Flow Transmitter: Micro-processor type with local flow rate indication and local flow totalization indicator, scaled in engineering units. Provide with four lines of display, zero flow stability, low flow cutoff, 120VAC. Provide with 4-20 mA output. Provide calibration certificate.

E. Flowmeter System shall be Rosemount 8750WDMW1A1FPSA080CA1M4DWG1Q4 R10 or pre-approved equal.

2.5 ACCESSORIES

A. Isolators. The current/current (I/I) and voltage/current (V/I) isolators shall have all solid state circuitry mounted in plug-in modules. Each isolator shall provide complete isolation and amplification of the 4-20 mA output signal from the 4-20 mA or 1-5 VDC input signal and the isolator power supply. The output signal shall be capable of driving a 600 ohm load. Accuracy shall be +/- 0.25% of span. The isolators shall be powered from a 120 VAC source. Isolators shall be intrinsically safe where shown on drawings. Each isolator shall have a seven year warranty. The isolators shall be as manufactured by AGM Electronics, Action Instruments, or equal.

B. Tubing shall be stainless steel tubing shall be Type 304 seamless, cold drawn and annealed per ASTM A269. Unless shown otherwise provide 1/4 inch diameter with 1/4 inch O.D. x 0.045 inch wall or 3/8 or ½ inch diameter where shown on plans which shall be 3/8-inch O.D. x 0.035-inch wall or ½ inch O.D. x 0.035-inch wall. Compression fittings shall be Type 316 stainless steel equal to Imperial, Swagelok or equal.

C. Instrument valves shall be 1/4-inch, 3/8-inch or 1/2-inch from Whitey, Hoke or equal to match tubing material and size.

PART 3 EXECUTION

3.1 WORKMANSHIP

A. All instrumentation work in this contract shall conform to the codes and standards outlined herein.

B. The CONTRACTOR shall employ personnel who 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 DISTRICT.

E. The DISTRICT reserves the right to halt any work that is found to be substandard or being installed by unqualified personnel.

F. Rejected equipment or equipment without approved submittals shall be immediately removed from the delivery or job site by the CONTRACTOR.

3.2 INSTALLATION

A. Install and supply all products necessary, at no additional cost to the DISTRICT, to provide an operational system. This shall include the following:

B. Contract Drawings are intended to show the basic functional requirements of the instrumentation system and do not relieve the CONTRACTOR from the responsibility to provide a complete and functioning system.

C. Provide relays, signal converters, isolators, boosters, power conditioners, circuit cards, and other miscellaneous devices as required for the proper interface.

D. Provide analog loop isolators where required to eliminate "ground loops."

E. All wires shall be identified with machine printed labels. Plastic wire gutters shall be used for routing of wire bundles. Wiring shall be neat and laced with plastic tie wraps.

F. The instrumentation and accessory equipment shall be installed in accordance with the manufacturer's instructions and located as shown on the Drawings. When manufacturer's installation literature specifies a particular location or orientation in a process line due to measurement accuracy considerations, the installation shall be in conformance with the manufacturer's instructions.

G. Engineering scales and charts for all instruments shall be provided that match the range of instruments that monitor the process.

H. Instrument installation methods.

1. Install instruments at the location shown on the Plans or approved by the DISTRICT. Instruments shall be NEMA rated for the installed location.

2. Install level and plumb.

3. All instruments shall be provided with floor stands or wall brackets as shown or required.

4. Mounting hardware, stands, channels, and spacers shall be either galvanized steel, stainless steel, or non metallic to match the NEMA rated location.

5. All screws and bolts shall be stainless steel.

I. Wiring and raceway installation methods.

1. Instrumentation wiring shall be carried in conduits provided in compliance with the Division 16, Electrical. All analog circuits shall be run as twisted pairs or triads. In no case shall a circuit be made up using conductors from different pairs or triads. Triads shall be used wherever three wire circuits are required. Triads are not to be formed by using two pairs. Terminal blocks shall be provided at all instrument cable junctions and all wires shall be identified at such junctions. Instrumentation wiring shall be run without splices between instruments, terminal boxes, or panels.

2. The number of signal wires listed on the Drawings is approximate only, and the CONTRACTOR shall determine the required number of signal pairs or triads to properly connect the system furnished, especially when substituting equipment.

J. Wiring, grounding, and shielding methods.

1. It is important to observe good grounding and shielding practices in the generally noisy environment in this application. The following practices shall be observed unless modified by manufacturer's standards:

2. Each electronic equipment chassis shall be grounded to power ground.

3. All analog signals shall be transferred over shielded twisted pair cables.

4. All communication signals shall be transferred over shielded cables.

5. All shields of analog inputs and outputs of the PLC shall be connected at the PLC unit only. They shall not contact ground at any other point including the transmitters or receiving devices.

6. Status and alarm signals routed through noisy environment shall be transferred over shielded twisted pair cables.

7. Each shield which is not connected to ground shall be covered with a heat shrink insulating boot. Shields shall be connected together at each transition from one cable to another for a continuous effective shield circuit. All shields shall be connected on terminal blocks.

K. Mechanical Installation

1. Install new instruments and transmitters at locations as shown on Drawings.

2. Install and calibrate indicators/transmitter and connect to elements per manufacturer's recommendations.

3. Ground transmitters/elements per manufacturer's recommendations.

3.3 TESTING

A. The CONTRACTOR shall use the services of qualified testing personnel for the purpose of performing inspections and tests as herein specified and indicated on the Drawings. 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. It is the intent of these tests to assure that the instrumentation system is operational and is installed in accordance with design Documents.

B. Test plans and test reports shall be treated as formal submittal. Tests and test plans shall be in the cause and effect format. The person conducting the test shall initiate an action (cause) and, upon the system's or subsystem's producing the correct result (effect), the

specific test requirement will have been satisfied.

C. The CONTRACTOR shall be responsible for each supplier of equipment to provide the following minimum services for each type of instrument supplied. The supplier shall use a qualified instrumentation field technician (sales representatives are not acceptable) to perform services listed herein.

1. Advise and instruct CONTRACTOR on installation requirements.

2. Check, calibrate, and place equipment in operation.

3. All programmable devices shall be programmed and tested prior to startup. Programming shall be adjusted or changed as directed by the DISTRICT, at no additional cost.

4. Coordinate with the DISTRICT and setup all alarm, process, and operation setpoints.

5. Perform the acceptance tests.

6. Visit the job as often as required and spend as much time as necessary to ensure an operational instrumentation system.

7. Be readily available by telephone to answer all questions on supplied equipment.

8. Provide training as specified in subsection labeled Training.

9. The CONTRACTOR shall insure each supplier of instrumentation assumes the responsibility for providing primary elements in a timely manner, for insertion into the process line, coordinating size and material type when applicable, overseeing the actual installation, calibration, and acceptance testing.

D. Operational Readiness Test (ORT)

1. Prior to startup, the complete instrumentation system shall be inspected, tested, and documented to show that it is ready for operation.

2. The CONTRACTOR shall prepare a test plan for the ORT and shall submit it for review at least 30 days before the ORT is performed.

3. The ORT shall demonstrate that the instrumentation system meets the requirements of the Specification which are nonloop-specific. Following are examples of nonloop- specific functions.

a. Capacity. Demonstrate that all components and subsystems have the specified capacity, including spare capacity.

b. Timing. Include tests to demonstrate all specified timing requirements.
c. Diagnostics. Include tests to demonstrate specified diagnostic capabilities and procedures.

4. If any component or subsystem fails the ORT, the CONTRACTOR shall correct the problem and repeat the test until it is successful.

5. After completion of the ORT, the CONTRACTOR shall prepare a test report and shall submit it for review. The ORT shall be successfully completed and the test report submitted to and reviewed by the DISTRICT before the FAT (functional acceptance test) is performed.

E. Functional Acceptance Test (FAT)

1. Once the facility has been started up and is operating, a witnessed FAT shall be performed on the complete instrumentation system to demonstrate that it is operating as specified and meets the requirements of the Specifications.

2. The CONTRACTOR shall prepare a test plan for the FAT and shall submit it for review at least 30 days before the FAT is performed.

3. The FAT shall operate all equipment and systems over the full operating range, shall demonstrate proper operation of alarms and indicators, and, in general, shall demonstrate that the equipment and systems meet the requirements of the Drawings and Specifications.

4. If any equipment or system fails the FAT, the CONTRACTOR shall correct the problem and shall repeat the test until it is successful.

5. The FAT shall be performed in the presence of the DISTRICT.

6. After completion of the FAT, the CONTRACTOR shall prepare a test report and shall submit it for review. The instrumentation system will not be accepted before the FAT is successfully completed and the test report submitted to and reviewed by the DISTRICT.

3.6 TRAINING

A. The CONTRACTOR shall provide four man-hour for training of the operation of the instrumentation system to DISTRICT personnel.

B. Instructions shall consist of the functional description of each piece of equipment, including calibration and setting of set points. Demonstration of the operation of each system shall be included.

C. The CONTRACTOR shall provide all manuals and study materials required for the training of DISTRICT personnel.

3.7 WARRANTY

A. The instrumentation 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 delivered; and of implementing corrective measures.

B. If the instrumentation supplier fails to respond in 2 working days, the DISTRICT at its option will proceed to have the warranty work completed by other resources; the total cost for these other resources shall be reimbursed in full by the CONTRACTOR. The use of other resources, as stated above, shall not change or relieve the CONTRACTOR or supplier from fulfilling the remainder of the warranty requirements.

C. Prior to "final acceptance", the CONTRACTOR shall furnish to the DISTRICT a listing of warranty information for all manufacturers of materials 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. Manufacturers warranty expiration date.

4. Completed test forms.

END OF SECTION

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

CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (USA NORTH 811) TELEPHONE–811 TWO DAYS (48 HOURS) PRIOR TO CONSTRUCTION.

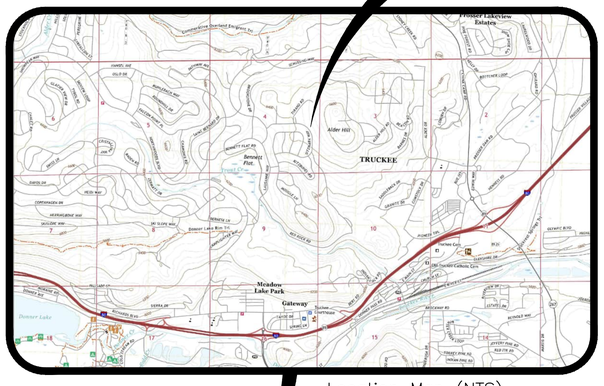
TRUCKEE DONNER Public Utility District

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT FINAL DESIGN DRAWINGS

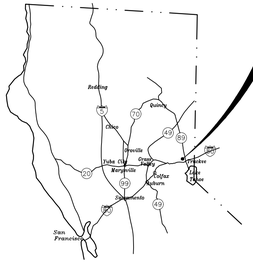
JULY 20, 2026

1. A MINIMUM HORIZONTAL SEPARATION OF 120" (10'), OUTSIDE OF PIPE TO OUTSIDE OF PIPE, MUST BE MAINTAINED BETWEEN WATER PIPELINES AND SEWER/STORM DRAIN STRUCTURES, EXISTING AND PROPOSED.
2. A MINIMUM HORIZONTAL SEPARATION OF 18" (1–1/2') MUST BE MAINTAINED BETWEEN WATER PIPELINES AND ALL OTHER FACILITIES, EXISTING AND PROPOSED.
3. A MINIMUM VERTICAL SEPARATION OF 12" (1') MUST BE MAINTAINED BETWEEN WATER PIPELINES AND ALL OTHER FACILITIES, EXISTING AND PROPOSED.
4. CONTRACTOR IS RESPONSIBLE TO NOTIFY DISTRICT PERSONNEL A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION AND/OR WORK INVOLVING DISTRICT STAFF. CALL 530–582–3950.
5. ALL CONSTRUCTION AND MATERIALS PER TDPUD REQUIREMENTS. SUBSTITUTION OF SPECIFIED MATERIALS MUST BE APPROVED BY THE DISTRICT PRIOR TO INSTALLATION.
6. DISTRICT APPROVAL MUST BE OBTAINED PRIOR TO BACKFILLING WATER SYSTEM IMPROVEMENTS. THE DISTRICT AT ITS SOLE DISCRETION, MAY REQUIRE ANY WORK NOT APPROVED FOR BACKFILLING TO BE EXPOSED FOR INSPECTION.
7. ALL FITTINGS SHALL BE FULLY RESTRAINED THROUGH THE USE OF THRUST BLOCKS, FIELD–LOCK GASKETS OR OTHER APPROVED METHODS.
8. ALL THRUST BLOCKS AND RESTRAINED JOINTS MUST BE VISUALLY INSPECTED BY THE DISTRICT PRIOR TO BACKFILLING.
9. ALL PIPELINE IMPROVEMENTS MUST MEET DISTRICT REQUIREMENTS RELATIVE TO PRESSURE TESTING AND DISINFECTION.
10. THE DISTRICT MUST REVIEW ALL MATERIALS USED ON THE PROJECT. A MINIMUM OF SEVEN (7) WORKING DAYS IS NEEDED TO RESPOND TO ALL MATERIAL SUBMITTALS.

PROJECT LOCATION



Location Map (NTS)



LOCATION & VICINITY MAPS OF PROJECT AREA

SHEET INDEX

1. G1 COVER SHEET
2. C1 EXISTING OVERALL SITE PLAN
3. C2 PUMP STATION SITE PLAN
4. C3 GRADING PLAN AND CROSS SECTIONS
5. C4 PIPELINE AND CONNECTION DETAILS
6. C5 MECHANICAL DETAILS
7. C6 BUILDING AND MECHANICAL DEMOLITION AND PHASING
8. C7 EROSION CONTROL PLAN
9. S1 STRUCTURAL ELEVATIONS
10. S2 ROOF DETAILS AND WALL REINFORCEMENT DETAILS
11. S3 STRUCTURAL EAVE AND PEAK DETAILS
12. S4 MASONRY STRUCTURAL DETAILS 1
13. S5 MASONRY STRUCTURAL DETAILS 2
14. S6 STRUCTURAL NOTES
15. D1 TDPUD DETAILS
16. E1 ELECTRICAL SYMBOLS, ABBREVIATIONS, AND AREA PLAN
17. E2 ELECTRICAL SITE PLAN
18. E3 BUILDING ELECTRICAL PLAN
19. E4 SINGLE LINE DIAGRAM
20. E5 ELEVATIONS
21. E6 BLOCK DIAGRAMS
22. E7 ELECTRICAL DETAILS 1
23. E8 ELECTRICAL DETAILS 2
24. E9 PROCESS AND INSTRUMENTATION DIAGRAM

SURVEY NOTES

1. Contour Interval equals 2'.
2. The elevation datum for these plans is assumed based on TDPUD GIS mapping

   Temporary Benchmark = Top of tank footing
   Assumed Top of Footing Elevation = 6473.0'

Prepared Under Direction Of:

Keith S. Knibb
Sauers Engineering, Inc.

REGISTERED PROFESSIONAL ENGINEER KEITH S KNIBB No. C 51290 Exp. 3-31-28 CIVIL STATE OF CALIFORNIA

7–20–26
Date

Approved By:

Brian Wright, General Manager
Truckee Donner Public Utility District

Date

RECORD DRAWINGS NOTE

ALL INFORMATION SHOWN ON THESE PLANS HAS BEEN PREPARED BY, OR UNDER DIRECTION OF, THE UNDERSIGNED ENGINEER. ADJUSTMENTS MADE IN THE FIELD DURING CONSTRUCTION ARE INCLUDED HEREIN AND ARE BASED UPON FIELD OBSERVATIONS MADE UNDER THE DIRECTION OF OR BY THE UNDERSIGNED AND/OR INFORMATION RECEIVED FROM THE PROJECT OWNER, PROJECT CONTRACTORS AND PUBLIC AGENCIES WHEN THE ENGINEER IS ADVISED IN WRITING OF SUCH CHANGE. THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, CHANGES TO THESE PLANS NOT AUTHORIZED BY THE ENGINEER.

DATE

ENGINEER SIGNATURE (STAMP OR SEAL)

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

COVER SHEET

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

0 1
BAR IS ONE INCH ON ORIG. DRAWING
IF BAR DOES NOT MEASURE ONE INCH, ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
DESIGN BY:
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CHECKED BY:
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DATE:
SCALES:
NA HORIZONTAL
NA VERTICAL

G1

SHEET: 1 of 24



EXISTING OVERALL SITE PLAN

SCALE: 1"=20'

REGISTERED PROFESSIONAL ENGINEER
SCOTT S. KNUDSEN
No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA

7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

EXISTING OVERALL SITE PLAN

TRUCKEE DONNER Public Utility District

11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896

NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
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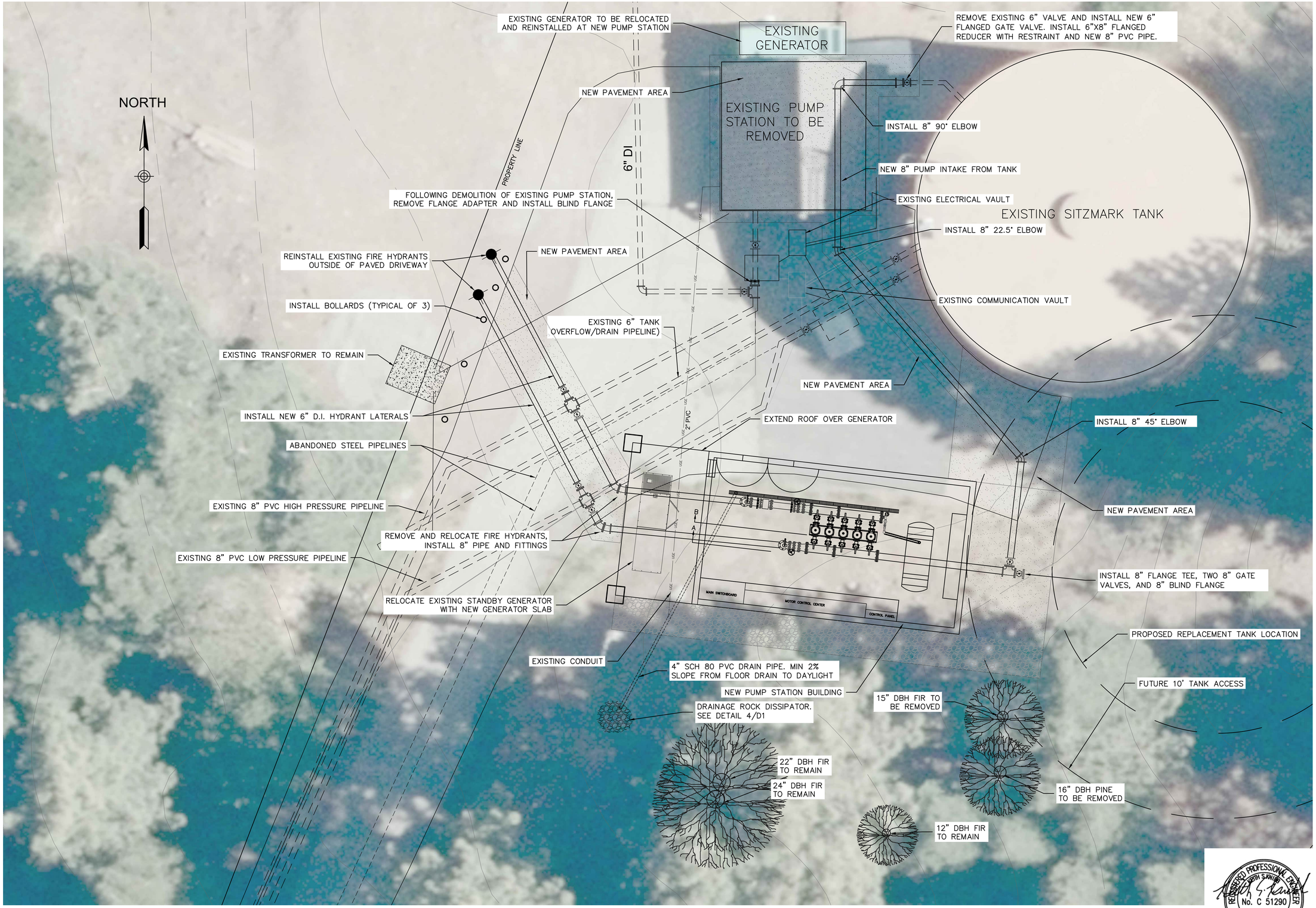
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DATE:

SCALES:
HORIZONTAL
VERTICAL

C1

SHEET: 2 of 24



PUMP STATION SITE PLAN

SCALE: 1"=5'

REGISTERED PROFESSIONAL ENGINEER
No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA
7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

PUMP STATION SITE PLAN

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
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HORIZONTAL
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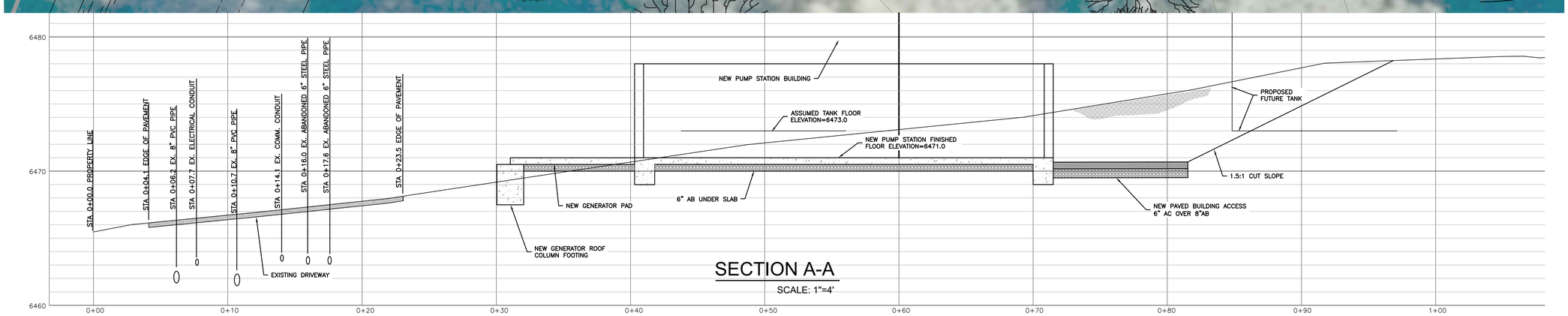
SHEET: 3 of 24



GRADING PLAN

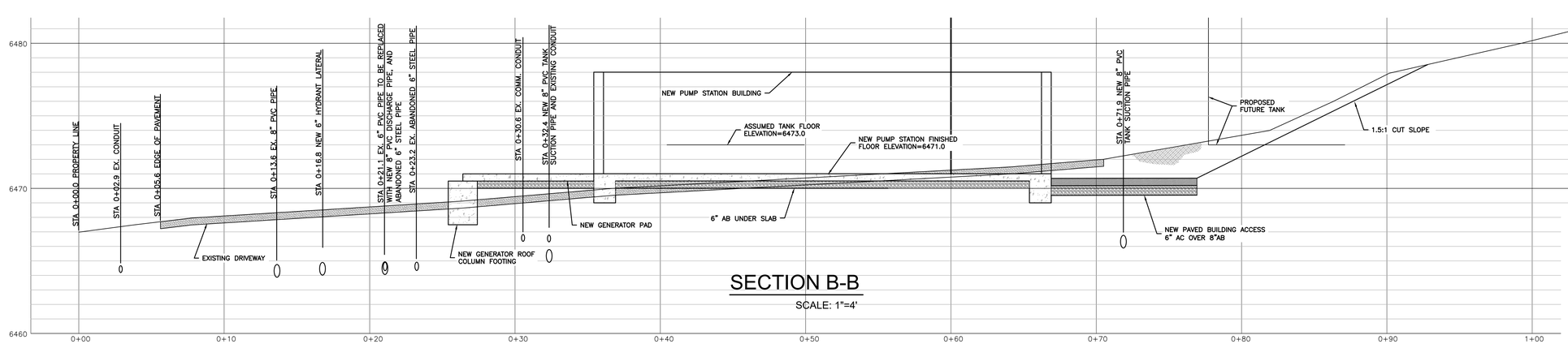
SCALE: 1"=4'

APPROXIMATE CUT VOLUME=3,144 CF=116 CY



SECTION A-A

SCALE: 1"=4'



SECTION B-B

SCALE: 1"=4'

REGISTERED PROFESSIONAL ENGINEER
KEITH S. KAWAI
No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA

7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

GRADING PLAN AND CROSS SECTIONS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

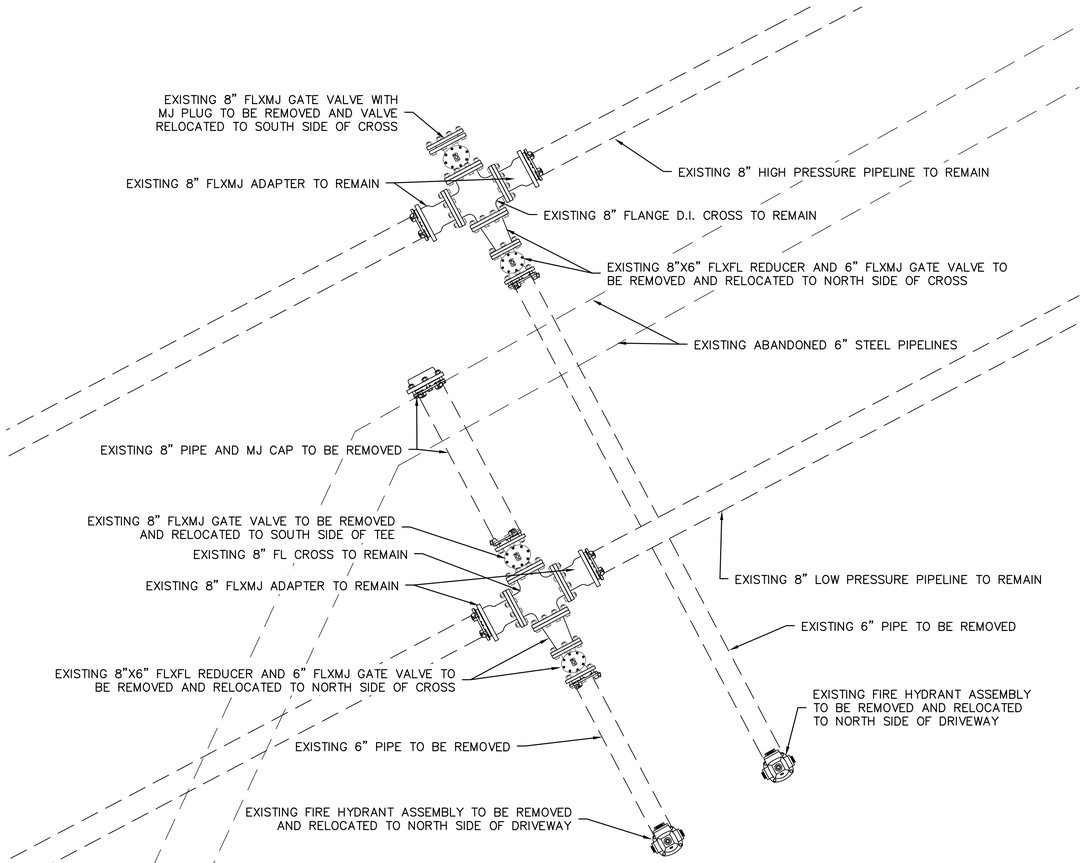
Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

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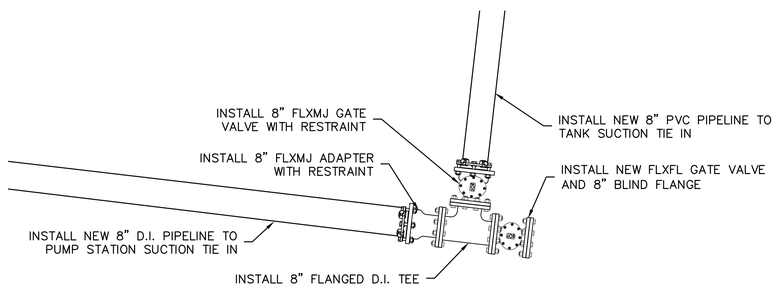
C3

SHEET: 4 of 24



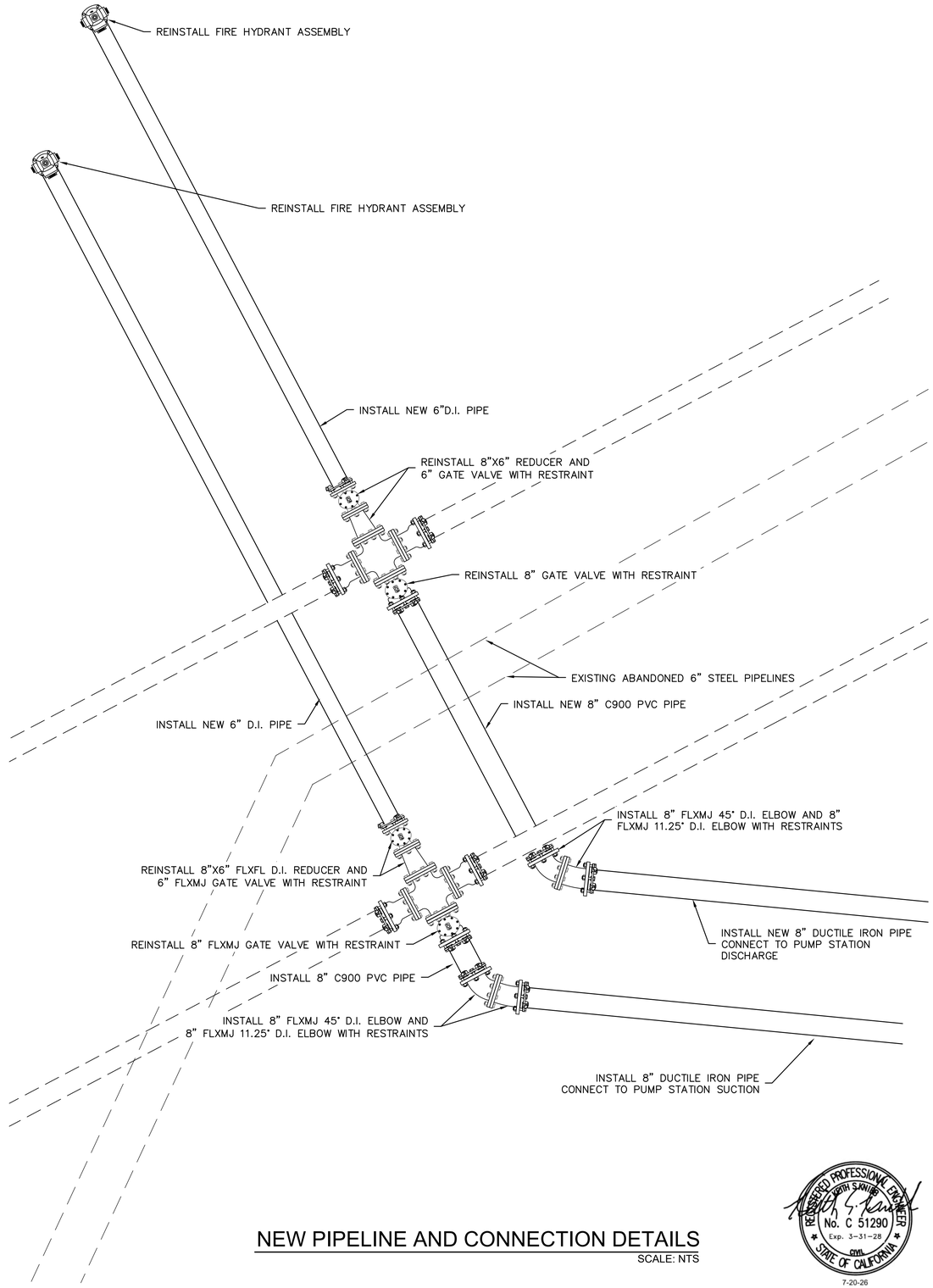
EXISTING PIPELINE DETAILS

SCALE: NTS



TANK SUCTION AND FUTURE TANK CONNECTION DETAILS

SCALE: NTS



NEW PIPELINE AND CONNECTION DETAILS

SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER
JOSEPH S. KNOX
No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA

7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

PIPELINE AND CONNECTION DETAILS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

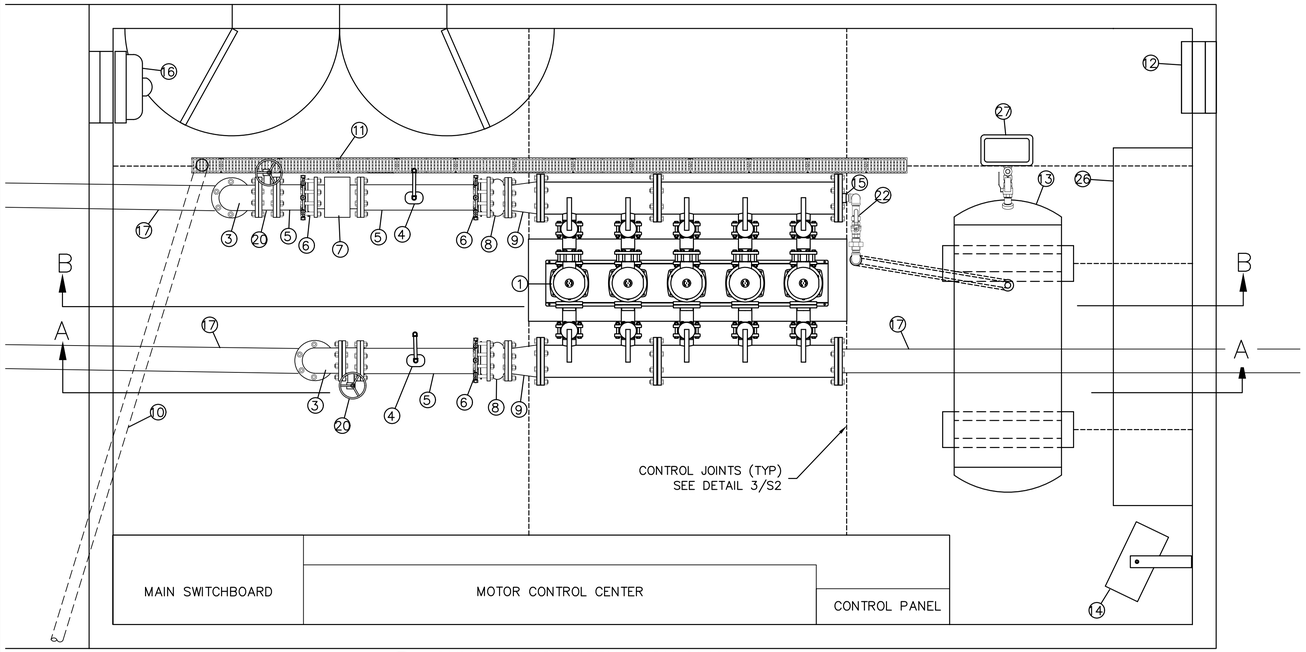
Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

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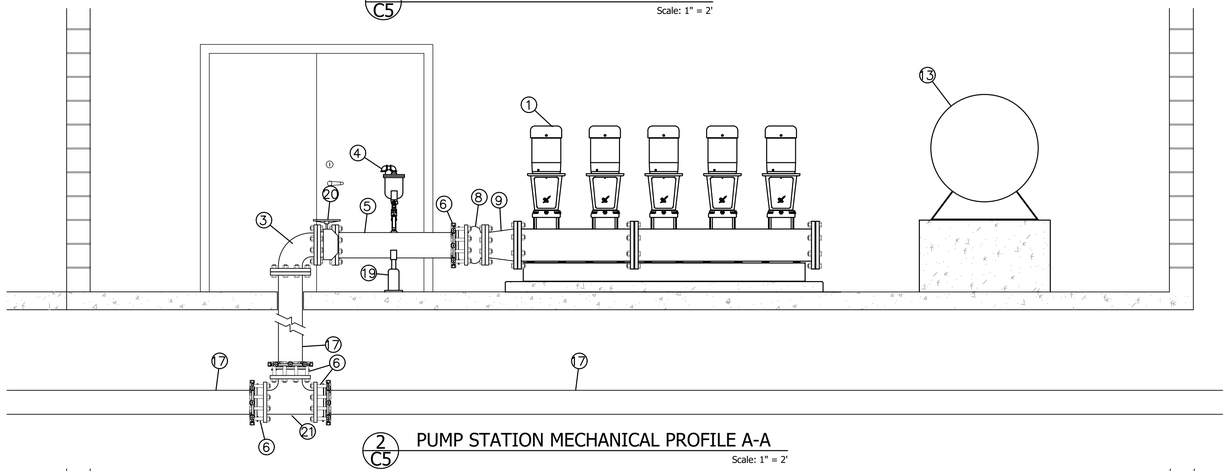
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SHEET: 5 of 24



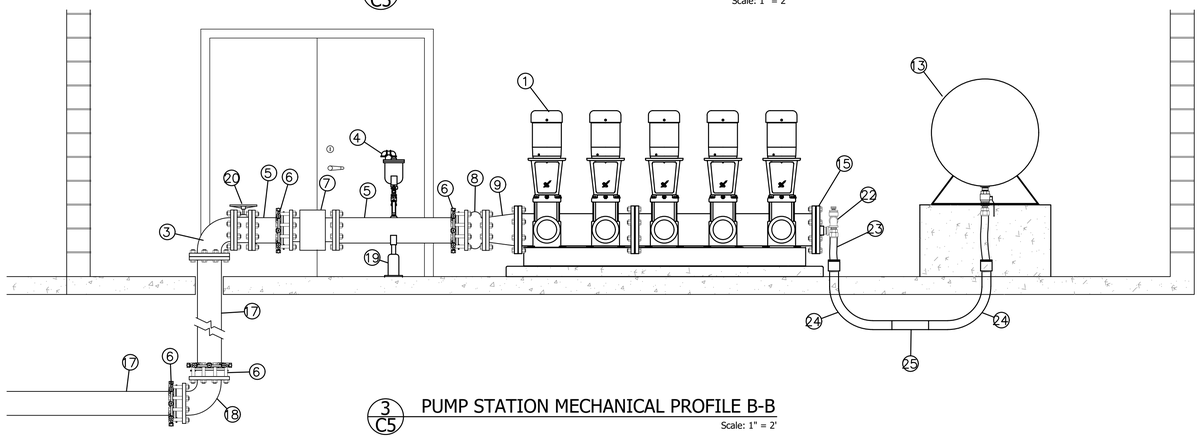
1/C5 PUMP STATION MECHANICAL PLAN

Scale: 1" = 2'



2/C5 PUMP STATION MECHANICAL PROFILE A-A

Scale: 1" = 2'



3/C5 PUMP STATION MECHANICAL PROFILE B-B

Scale: 1" = 2'

EQUIPMENT LIST:

1. GRUNDFOS HYDRO MPC-EC (CUE) 5CR 64-1 FIVE PUMP SKID MOUNTED SYSTEM
2. 8" DUCTILE IRON PIPELINE
3. 8" FLXFL WELDED STEEL 90° ELBOW, EPOXY COATED
4. AIR RELEASE ASSEMBLY
5. 8" WELDED STEEL FLXPE PIPE, EPOXY COATED
6. 8" RESTAINED FLANGE ADAPTER, EBBA IRON 2108 OR EQUAL
7. 8" MAGNETIC FLOW METER
8. 8" FLXFL MOLDED SPHERICAL JOINT, PROCO STYLE 240 SINGLE SPHERE OR EQUAL
9. 10"X8" FLXFL DUCTILE IRON REDUCER
10. 4" PVC DRAIN PIPE AND FITTINGS
11. FLOOR TRENCH DRAIN
12. INTAKE AIR VENT WITH LOUVER AND DAMPER
13. HYDROPNEUMATIC PRESSURE TANK, 400 GALLON, 36"ø X98", HANSEN WK-864-B OR EQUAL
14. ELECTRIC SPACE HEATER
15. 10" S.S. COMPANION FLANGE WITH 2" NPT TAP
16. EXHAUST FAN WITH LOUVER AND DAMPER
17. 8" FLXPE D.I. PIPE
18. 8" FLANGED D.I. 90° ELBOW
19. 8" PIPE STAND, STANDON S-92 SADDLE SUPPORT OR EQUAL
20. 8" BUTTERFLY VALVE
21. 8" FL D.I. TEE
22. HYDRO TANK CONNECTION DETAIL, SEE DETAIL 7/C5
23. 2" HDPE PIPE
24. 3" RIGID STEEL LONG RADIUS SWEEP
25. 3" RIGID STEEL CONDUIT
26. ROLLING DOOR HOOD
27. PRESSURE TANK COMPRESSOR ASSEMBLY, SEE DETAIL 6/C5

CONSTRUCTION NOTES

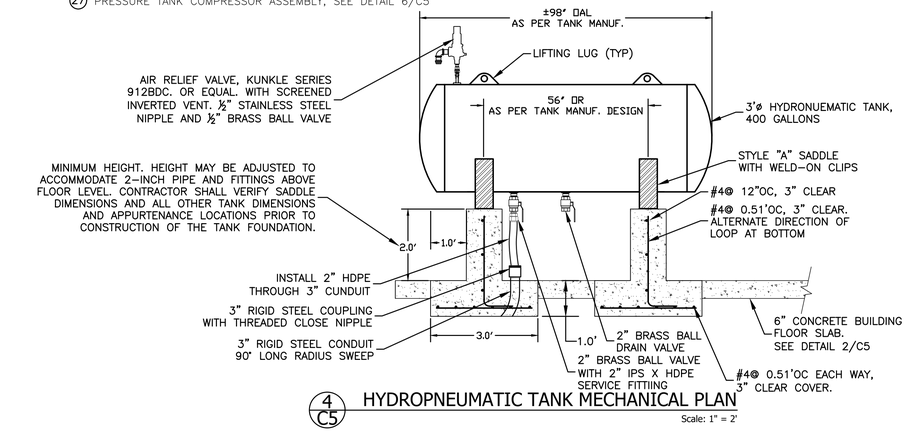
WRAP PIPES PASSING THROUGH CONCRETE FLOORS AND WALLS WITH ASPHALT SATURATED FELT PAPER OR OTHER WATERPROOF MATERIAL TO PREVENT BONDING TO CONCRETE.

DIMENSIONS OF PUMPS AND FITTINGS MAY VARY FROM THOSE SHOWN ON THE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING ACTUAL DIMENSIONS PRIOR TO INSTALLATION.

PIPING AND FITTINGS ARE SIMILAR FOR EACH SET OF PUMPS.

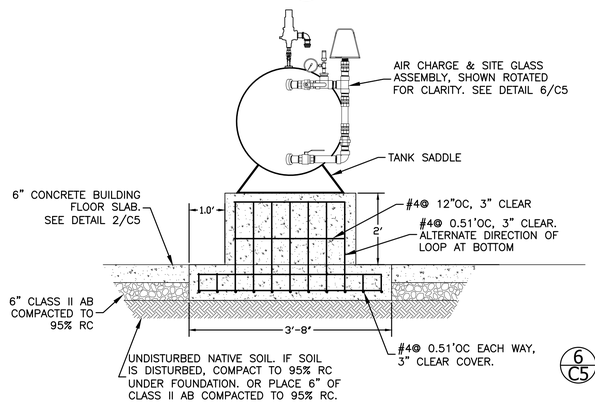
FLOOR SHALL BE SLOPED TOWARD FLOOR DRAINS.

DUCTILE IRON PIPE SHALL BE FLANGED OR OTHERWISE MECHANICALLY RESTRAINED TO PREVENT MOVEMENT. STEEL PIPE SHALL BE FLANGED OR WELDED. FLANGED ADAPTORS SHALL BE RESTRAINED.



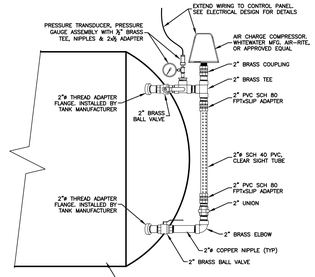
4/C5 HYDROPNEUMATIC TANK MECHANICAL PLAN

Scale: 1" = 2'



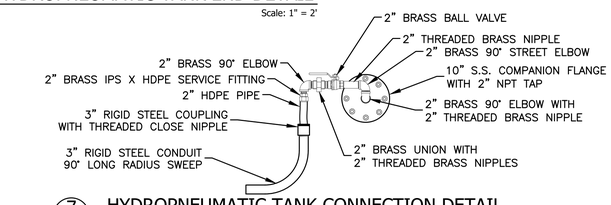
5/C5 HYDROPNEUMATIC TANK END DETAIL

Scale: 1" = 2'



6/C5 SIGHT GLASS AND COMPRESSOR DETAIL

Scale: 1" = 2'



7/C5 HYDROPNEUMATIC TANK CONNECTION DETAIL

Scale: NTS

REGISTERED PROFESSIONAL ENGINEER
No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA
7-20-26

INITIAL	REVISIONS	REV	DATE

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

MECHANICAL DETAILS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

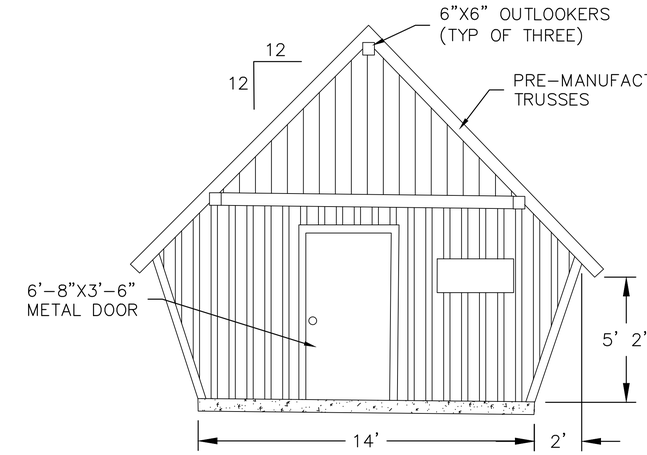
Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

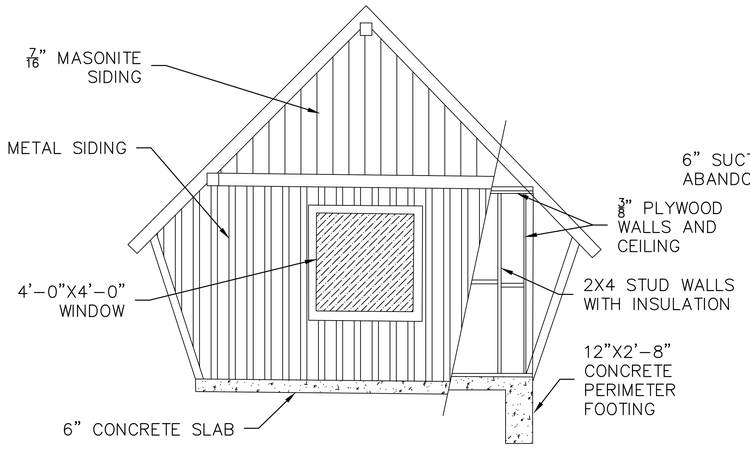
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BAR IS ONE INCH ON ORIG. DRAWING
IF BAR DOES NOT MEASURE ONE INCH, ADJUST SCALES ACCORDINGLY

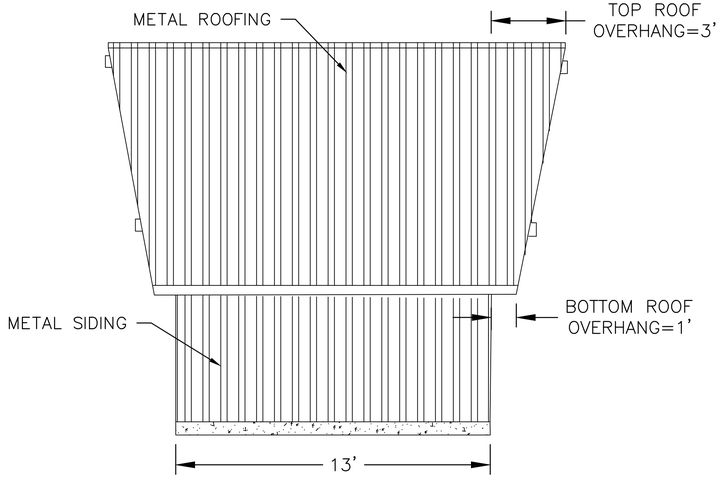
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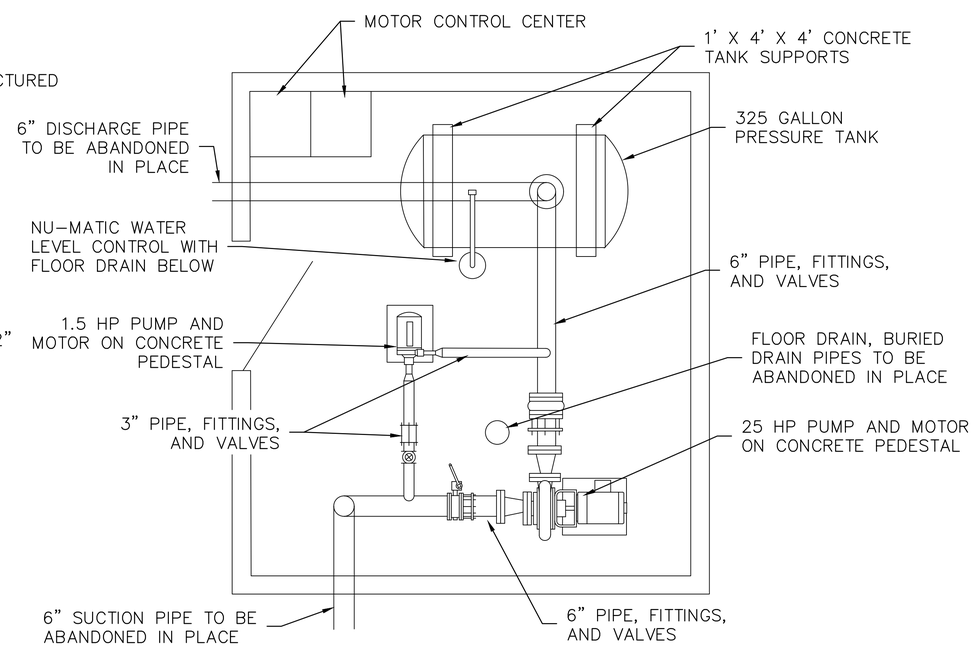
C5

SHEET: 6 of 24







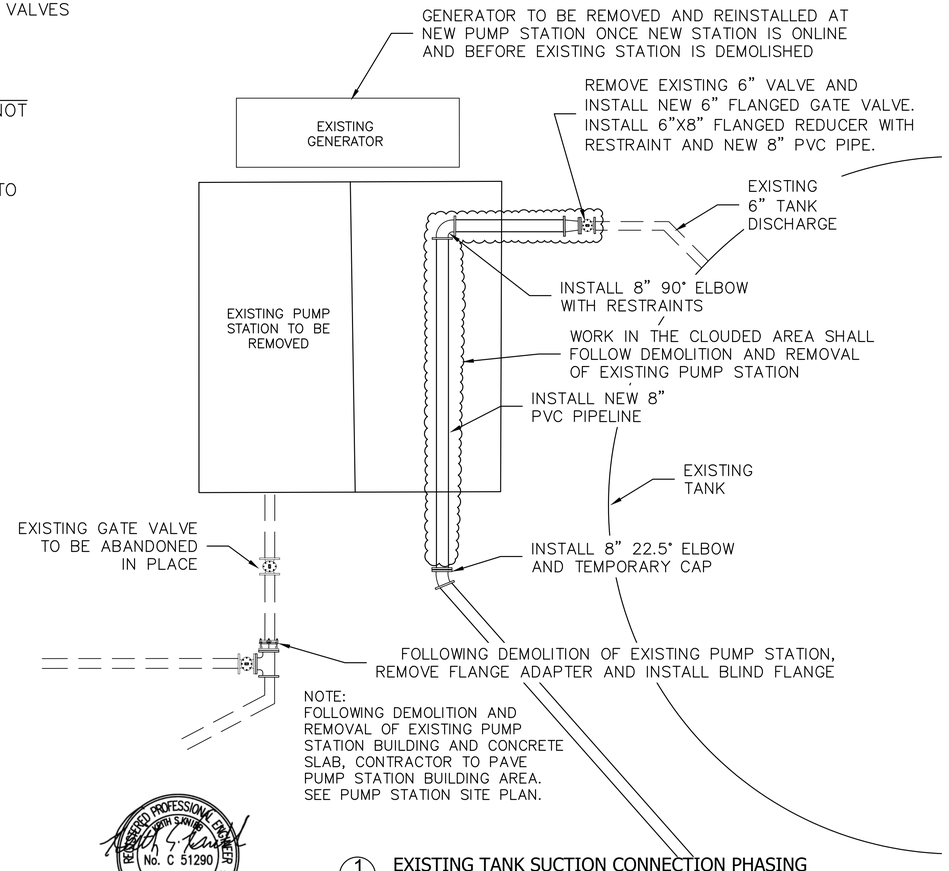


DEMOLITION NOTES

DEMOLITION OF THE EXISTING PUMP STATION WILL NOT TAKE PLACE UNTIL THE NEW PUMP STATION IS COMPLETED, TESTED, AND PUT IN SERVICE.

INFORMATION SHOWN ON THIS SHEET IS INTENDED TO GIVE THE CONTRACTOR AN IDEA OF THE SCOPE OF THE MAJOR COMPONENTS TO BE DEMOLISHED AND DISPOSED.

CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLISHING AND DISPOSING ALL MATERIALS AND EQUIPMENT ASSOCIATED WITH THE EXISTING PUMP STATION REGARDLESS WHETHER IT IS SHOWN ON THESE PLANS.



1 / C6 EXISTING TANK SUCTION CONNECTION PHASING

Scale: NTS

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No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA
7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

BUILDING AND MECHANICAL DEMOLITION AND PHASING

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
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NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

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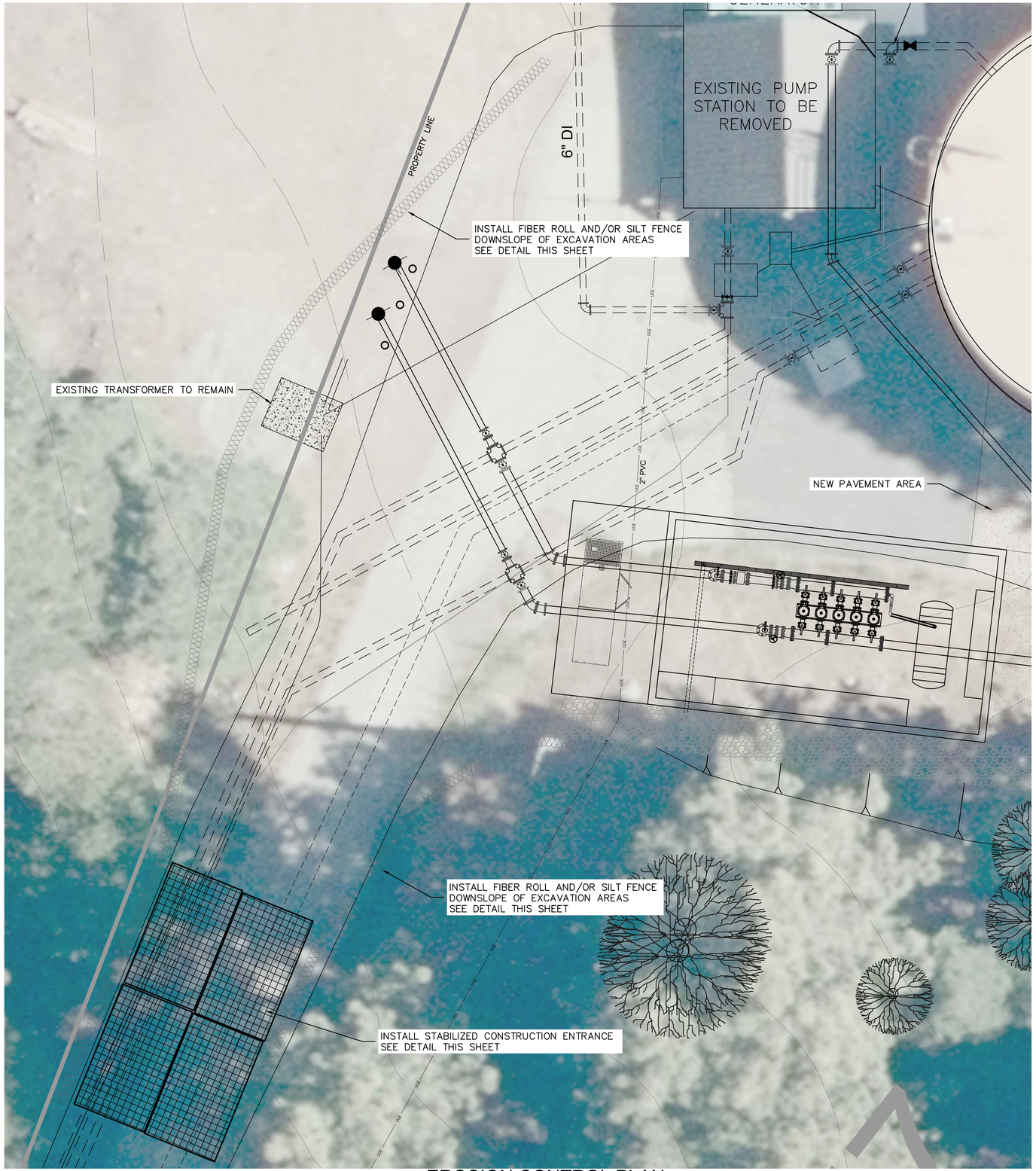
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DESIGN BY:
DRAFTING BY:
CHECKED BY:

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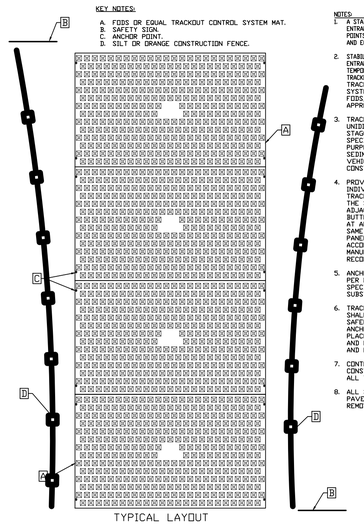
SCALES:
HORIZONTAL
VERTICAL

C6



EROSION CONTROL PLAN

SCALE: 1"=5'

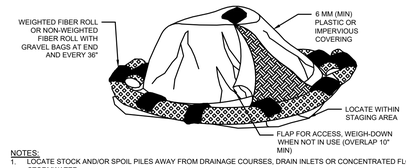


NOTES:

1. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE USED AT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS.
2. STABILIZED CONSTRUCTION ENTRANCES SHALL CONSIST OF TEMPORARY TRACKOUT MATS. TRACKPUT MATS SHALL BE FDDS TRACKOUT CONTROL MAT SYSTEM MANUFACTURER FDDS, 844-255-2653, OR APPROVED EQUAL.
3. TRACKING PADS SHALL BE UNIDIRECTIONAL AND HAVE STAGGERED PYRAMIDS SPECIFICALLY FOR THE PURPOSE OF CONTROLLING SEDIMENT TRACK-OUT FROM VEHICLES EXITING A CONSTRUCTION SITE.
4. PROVIDE NUMBER OF INDIVIDUAL PANELS OF TRACKING PAD TO MAKE UP THE SIZE REQUIRED. ADJACENT PANELS SHALL BE BUTTED TOGETHER AND BE AT APPROXIMATELY THE SAME ELEVATION. ANCHOR PANELS AGAINST SLIDING ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
5. ANCHOR MATS TO SURFACE PER MANUFACTURES SPECIFICATION PER SUBSTRATE.
6. TRACKOUT CONTROL SYSTEM SHALL BE INSTALLED SAFELY WITH PROPER ANCHORING AND SIGNS PLACED AT THE ENTRANCE AND EXIT TO CAUTION USERS AND OTHERS.
7. CONTRACTOR TO MAINTAIN CONSTRUCTION ENTRANCE AT ALL TIMES.
8. ALL SEDIMENT DEPOSITS ON PAVED ROADWAYS SHALL BE REMOVED WITHIN 24 HOURS.

1/8 STABILIZED CONSTRUCTION ENTRANCE DETAILS

Scale: N.T.S.



NOTES:

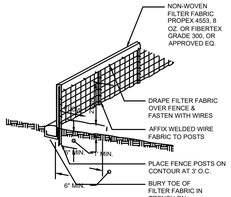
1. LOCATE STOCK AND/OR SPOIL PILES AWAY FROM DRAINAGE COURSES, DRAIN INLETS OR CONCENTRATED FLOWS OF STORMWATER.
2. ALL STOCK AND/OR SPOIL PILE PERIMETERS SHALL BE PROTECTED WITH TEMPORARY LINEAR SEDIMENT BARRIERS.
3. COVER ALL STOCK AND/OR SPOIL PILES WITH 6 MIL PLASTIC, CANVAS TARP OR IMPERVIOUS COVER TO PREVENT WIND AND RAIN EROSION. EVENLY SPACE WEIGHTS (GRAVEL BAGS) ON COVER TO KEEP IN PLACE DURING WIND.
4. CONDUCT REGULAR INSPECTIONS OF STOCK AND/OR SPOIL PILES DURING AND AFTER RAIN EVENTS
5. VERY LARGE STOCK AND/OR SPOIL PILES MAY REQUIRE SILT FENCE IN LIEU OF FIBER ROLLS.
6. REMOVE SPOIL PILES FROM CONSTRUCTION SITE AS SOON AS POSSIBLE.
7. STOCK/SPOIL PILES MUST BE STORED WITHIN THE APPROVED STAGING AREA.

2/8 STOCKPILE MANAGEMENT DETAILS

Scale: N.T.S.

GENERAL EROSION CONTROL NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE EFFECTIVE FOR THE DURATION OF THE CONSTRUCTION ACTIVITY.
2. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED. CHANGES TO THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE MADE TO MEET FIELD CONDITIONS, BUT ONLY WITH THE APPROVAL OF OR AT THE DIRECTION OF THE ENGINEER OR DISTRICT REPRESENTATIVE.
3. ALL SIDEWALK AND PAVED AREAS SHALL BE KEPT CLEAR OF EARTH MATERIAL AND DEBRIS. THE SITE SHALL BE MAINTAINED SO AS TO MINIMIZE SEDIMENT LADEN RUNOFF FROM ENTERING ANY STORM DRAINAGE SYSTEM.
4. THE EROSION AND SEDIMENTATION CONTROL PLAN COVERS ONLY THE FIRST WINTER DURING WHICH CONSTRUCTION IS TO TAKE PLACE. PLANS ARE TO BE RESUBMITTED PRIOR TO SEPTEMBER 1 OF EACH SUBSEQUENT YEAR UNTIL THE SITE IMPROVEMENTS HAVE BEEN ACCEPTED.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSPECT AND REPAIR ALL EROSION CONTROL FACILITIES AT THE END OF EACH WORK DAY DURING THE RAINY SEASON.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT TEMPORARY BORROW AREAS AND/OR STOCKPILES WITH APPROPRIATE EROSION CONTROL MEASURES SATISFACTORY TO THE ENGINEER OR DISTRICT REPRESENTATIVE.
7. THE CLEANING OF PAVED STREETS, DURING AND AT THE COMPLETION OF CONSTRUCTION, SHALL BE PERFORMED WITH MECHANICAL SWEEPERS. THE USE OF WATER TRUCKS TO "WASH DOWN" THE STREET IS PROHIBITED.
8. THE CONTRACTOR IS RESPONSIBLE FOR THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE EROSION CONTROL DEVICES UNTIL CONSTRUCTION IS COMPLETED AND APPROVED
9. CONTRACTOR MUST PROVIDE A 24-HOUR TELEPHONE NUMBER AND A NAME(S) OF THE PERSON(S) RESPONSIBLE FOR EMERGENCY WORK. A TELEPHONE ANSWERING MACHINE OR ANSWERING SERVICE IS UNACCEPTABLE.
10. THE EROSION CONTROL DEVICES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO GRADING ACTIVITIES.
11. ALL LOOSE SOIL AND DEBRIS SHALL BE REMOVED FROM THE STREET AREAS UPON STARTING OPERATIONS AND PERIODICALLY THEREAFTER.
12. STOCKPILES OF THE NECESSARY BEST MANAGEMENT PRACTICE MATERIALS, AND THE TOOLS AND EQUIPMENT NEEDED, SHALL BE AVAILABLE ON-SITE AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES OR TO REPAIR ANY DAMAGED EROSION CONTROL MEASURES WHEN RAIN IS IMMINENT. A STANDBY CREW SHALL ALSO BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON.
13. ADJACENT PROPERTIES SHALL BE PROTECTED FROM STORM WATER RUNOFF, MUD, SILT, ETC.
14. EROSION CONTROL FENCES SHALL BE INSPECTED BY THE CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
15. ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE SITE.
16. ALL EXPOSED GRADED SURFACES STEEPER THAN 1V:4H SHALL BE COVERED WITH AN EROSION CONTROL BLANKET.

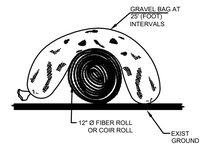


FILTER FENCE - UNPAVED AREAS

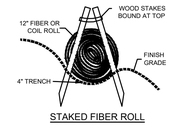
NOTES:
1 FENCE SHALL BE INSTALLED PRIOR TO CONSTRUCTION TO MITIGATE THE EFFECTS OF EROSION & REMOVED UPON COMPLETION OF THE PROJECT.
2. FOR PAVED AREAS THE CONTRACTOR MAY ELECT TO USE EITHER TYPE OF PROTECTION AS APPROPRIATE.

3/8 TEMPORARY SILT FENCE DETAILS

Scale: N.T.S.



WEIGHTED FIBER ROLL



STAKED FIBER ROLL

NOTE: PLACE FIBER ROLLS ALONG CONTOUR.

4/8 FIBER ROLL DETAILS

Scale: N.T.S.

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7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

EROSION CONTROL PLAN

TRUCKEE DONNER Public Utility District

11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896

NEVADA COUNTY CALIFORNIA

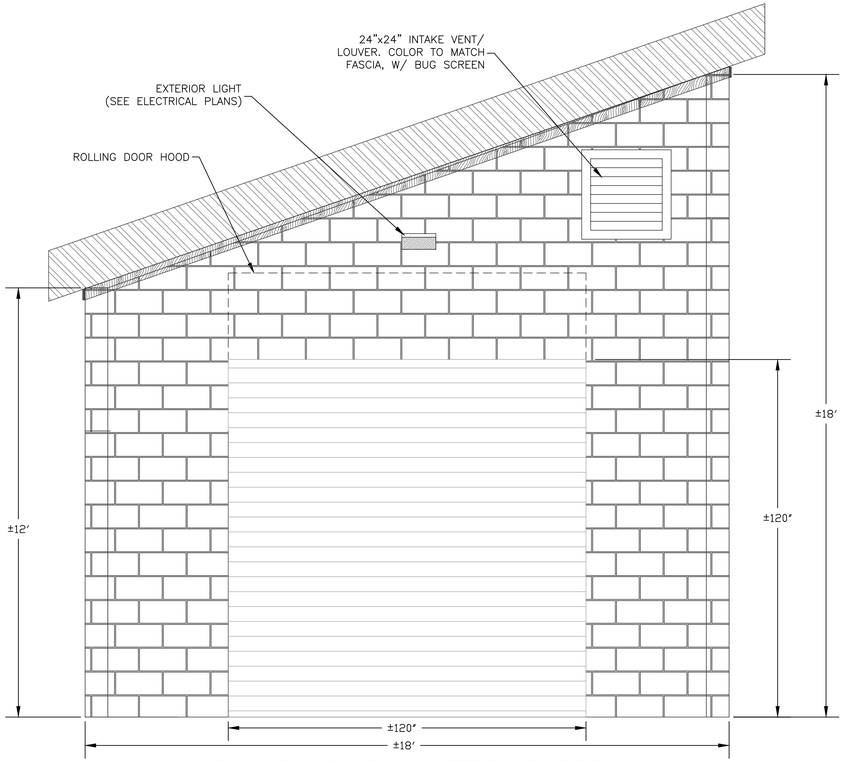
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Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

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BAR IS ONE INCH ON ORIG. DRAWING
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HORIZONTAL
VERTICAL

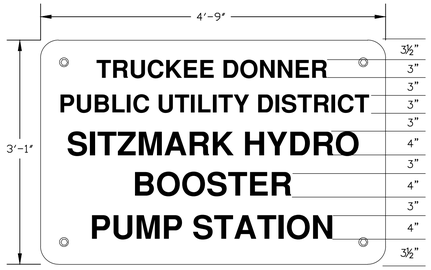
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SHEET: 8 of 24



1/S1 BUILDING ELEVATION DETAIL - EAST END

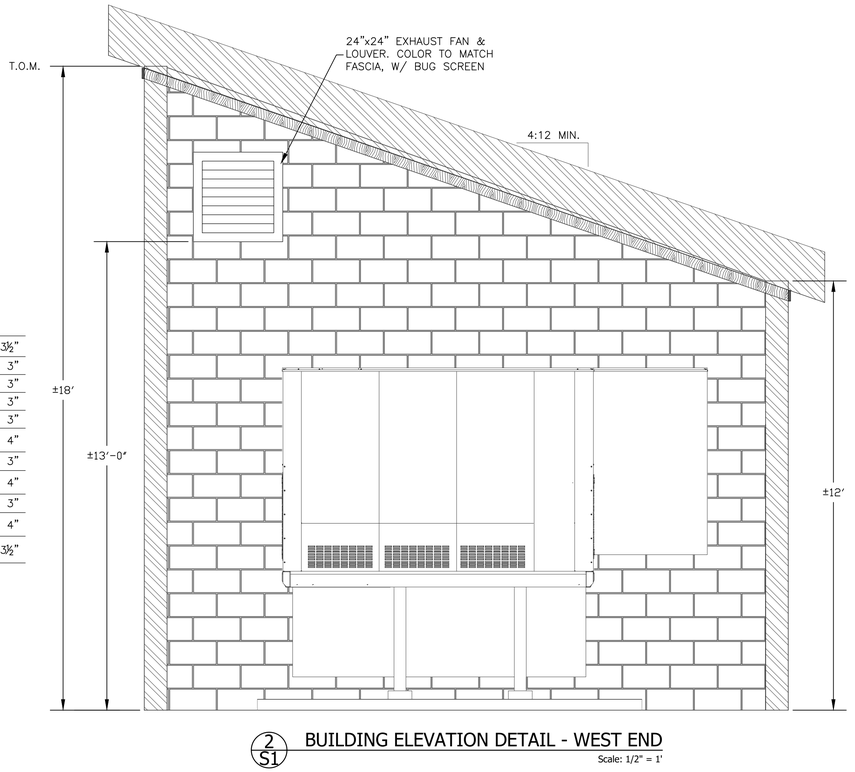
Scale: 1/2" = 1'



2" THICK LAMINATED REDWOOD
WITH ½" ROUTED LETTERS.
PAINT LETTERS YELLOW.

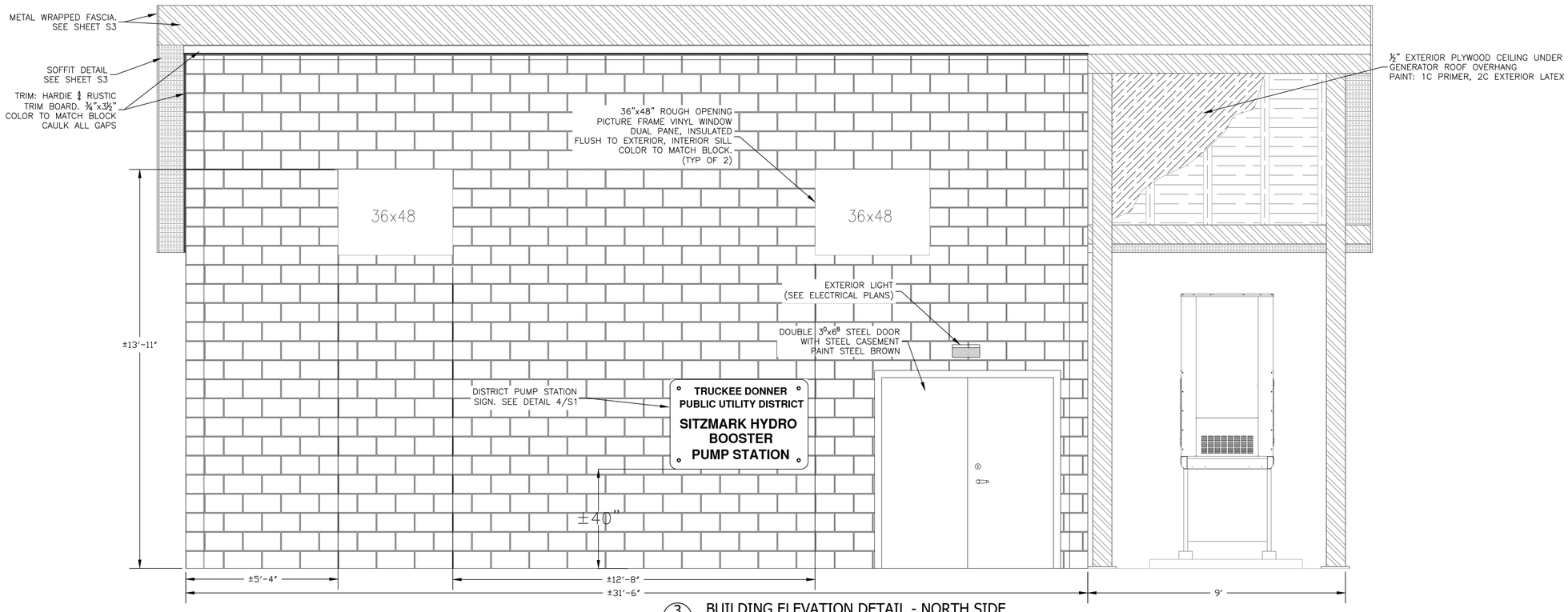
4/S1 SIGN DETAIL

Scale: NO SCALE



2/S1 BUILDING ELEVATION DETAIL - WEST END

Scale: 1/2" = 1'



3/S1 BUILDING ELEVATION DETAIL - NORTH SIDE

Scale: 1/2" = 1'

REGISTERED PROFESSIONAL ENGINEER
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No. C 51290
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STATE OF CALIFORNIA

7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

STRUCTURAL ELEVATIONS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
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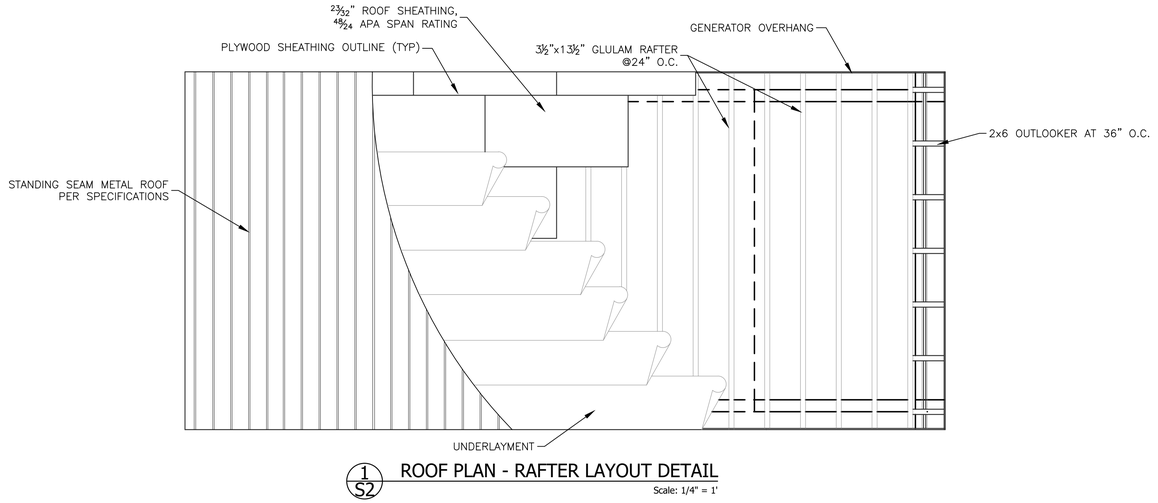
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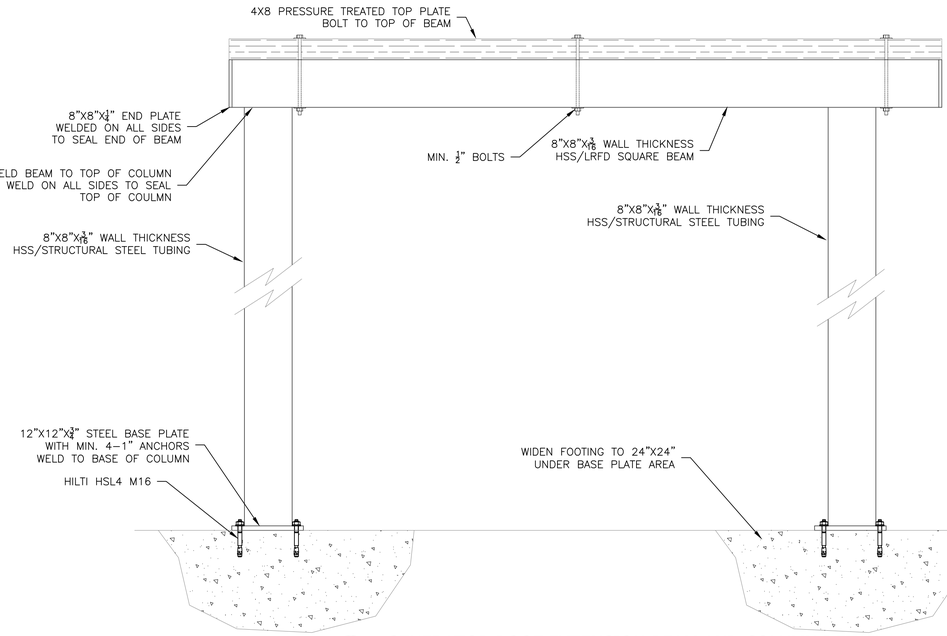
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9 of 24



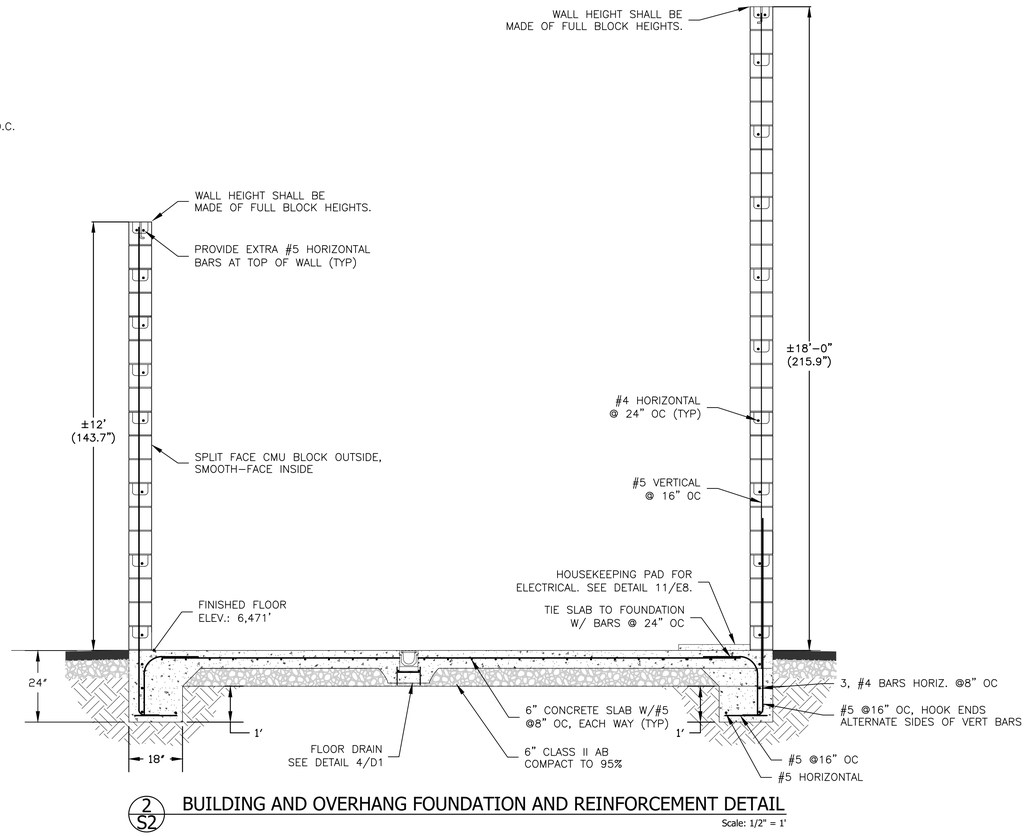
1/S2 ROOF PLAN - RAFTER LAYOUT DETAIL

Scale: 1/4" = 1'



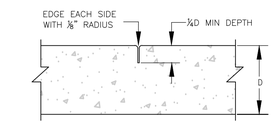
3/S2 GENERATOR ROOF EXTENSION BEAM AND COLUMN DETAIL

Scale: 1" = 1'



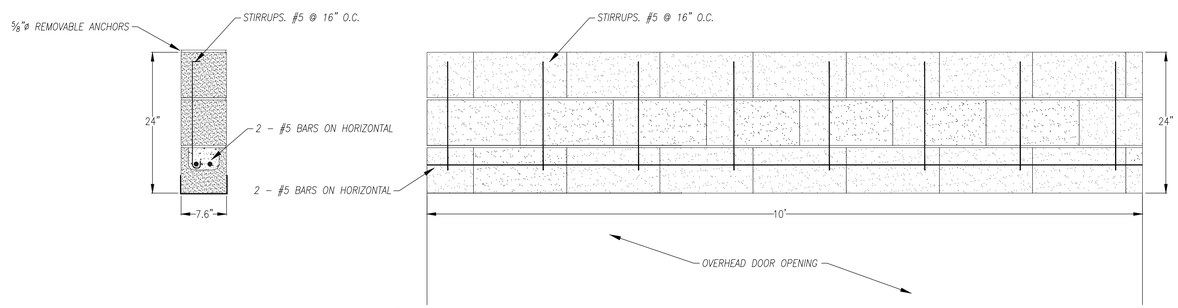
2/S2 BUILDING AND OVERHANG FOUNDATION AND REINFORCEMENT DETAIL

Scale: 1/2" = 1'



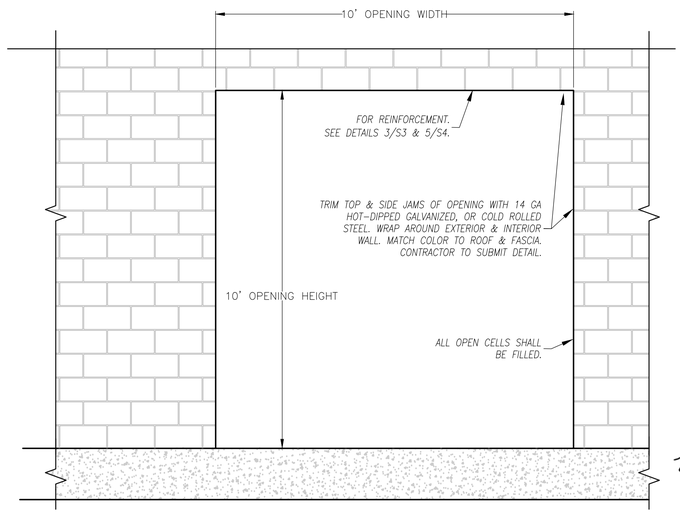
3/S2 TOOLED CONTROL JOINT

Scale: NTS



3/S2 OVERHEAD DOOR REINFORCEMENT DETAIL

Scale: 1" = 1'



4/S2 OVERHEAD DOOR OPENING DETAIL

Scale: 1/2" = 1'

REGISTERED PROFESSIONAL ENGINEER — JOSEPH S. SAUERS — No. C 51290 — Exp. 3-31-28 — CIVIL — STATE OF CALIFORNIA

7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

ROOF DETAILS & WALL OPENING REINFORCMENT DETAILS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

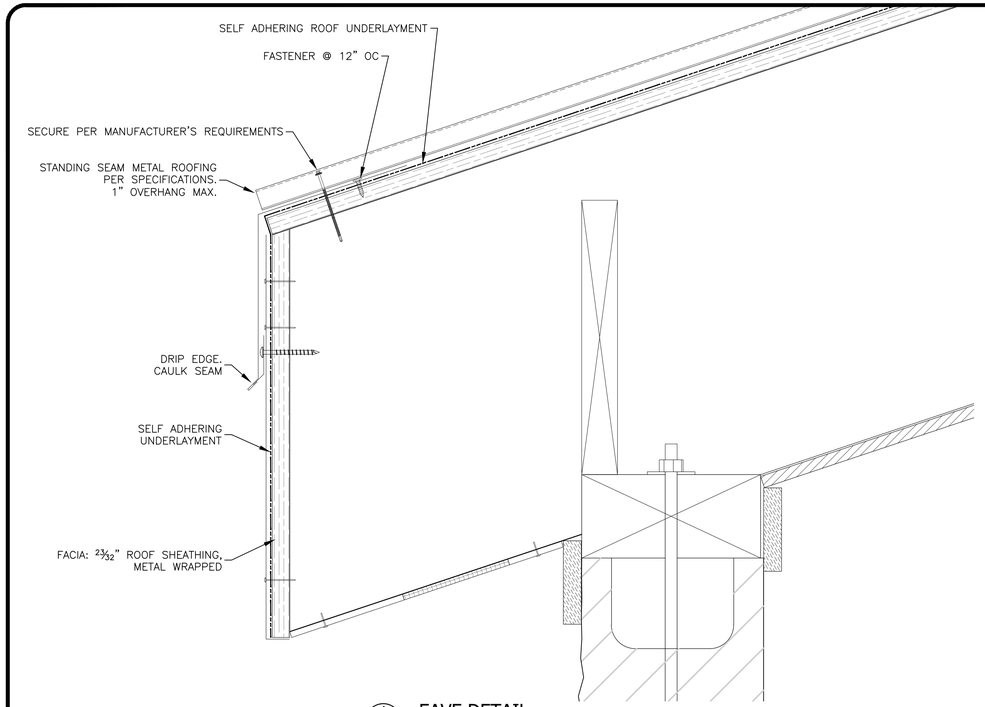
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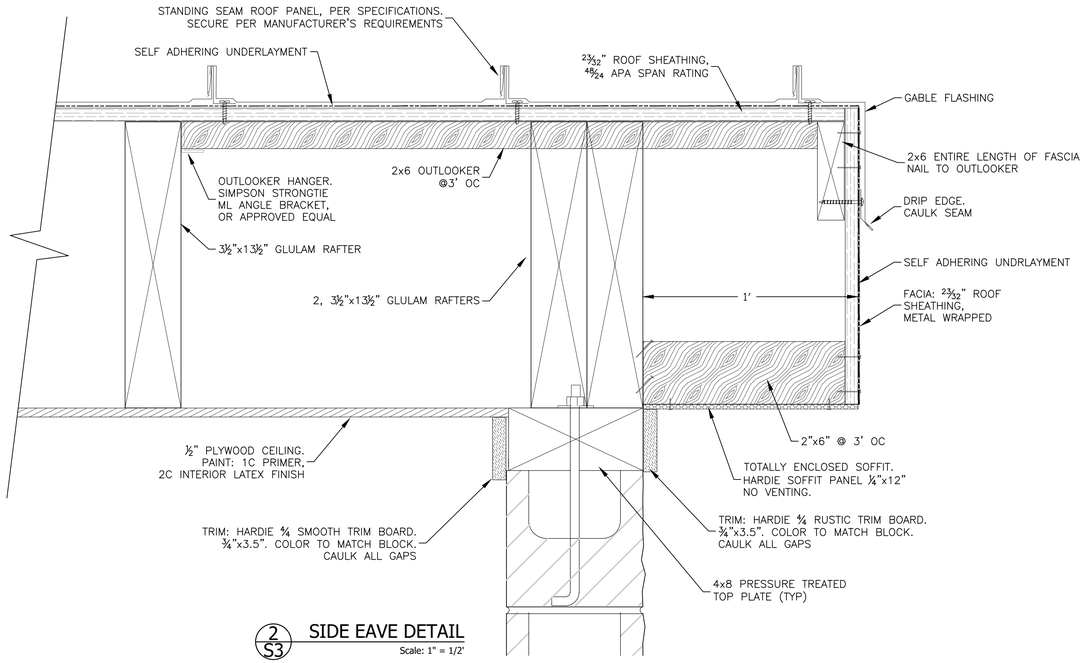
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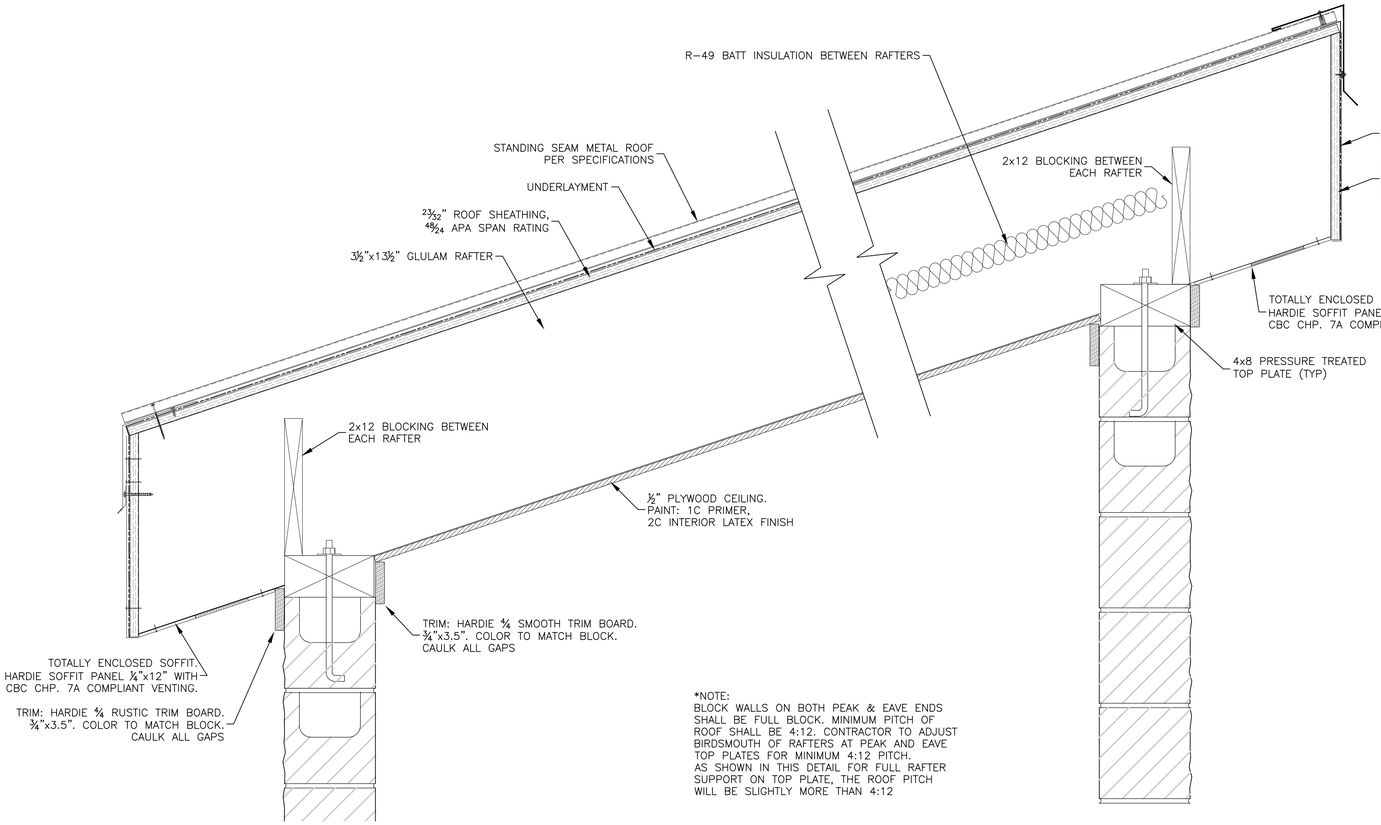
SHEET: 10 of 24



1/S3 EAVE DETAIL
Scale: 1" = 1/2'

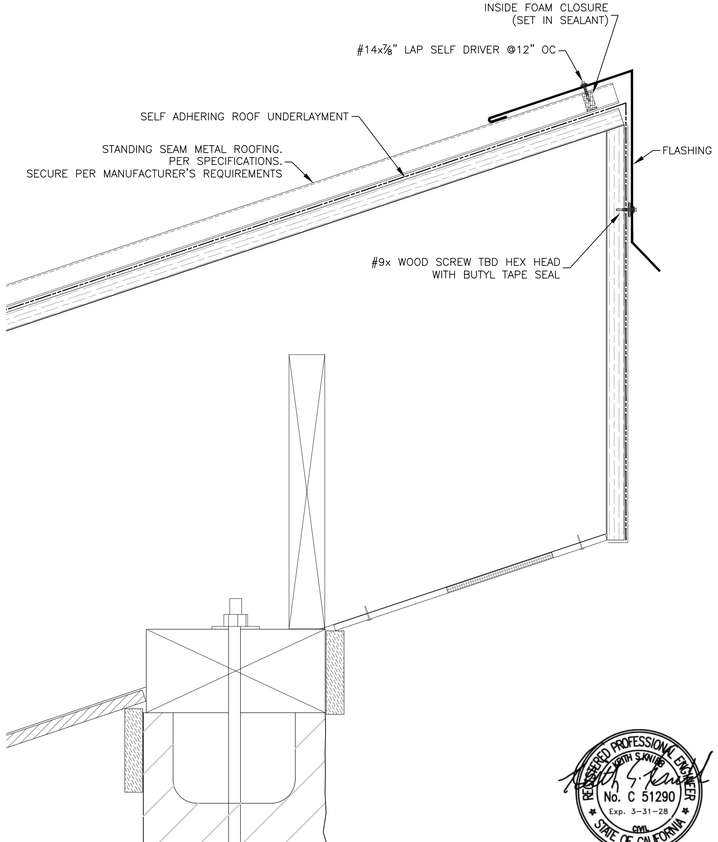


2/S3 SIDE EAVE DETAIL
Scale: 1" = 1/2'



*NOTE:
BLOCK WALLS ON BOTH PEAK & EAVE ENDS SHALL BE FULL BLOCK. MINIMUM PITCH OF ROOF SHALL BE 4:12. CONTRACTOR TO ADJUST BIRDSMOUTH OF RAFTERS AT PEAK AND EAVE TOP PLATES FOR MINIMUM 4:12 PITCH. AS SHOWN IN THIS DETAIL FOR FULL RAFTER SUPPORT ON TOP PLATE, THE ROOF PITCH WILL BE SLIGHTLY MORE THAN 4:12

3/S3 EAVE & PEAK DETAIL
Scale: 1" = 1/2'



4/S3 PEAK DETAIL
Scale: 1" = 1/2'

REGISTERED PROFESSIONAL ENGINEER
KEITH S. SAUERS
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Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA
7-20-26

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SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

STRUCTURAL EAVE & PEAK DETAILS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
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NEVADA COUNTY CALIFORNIA

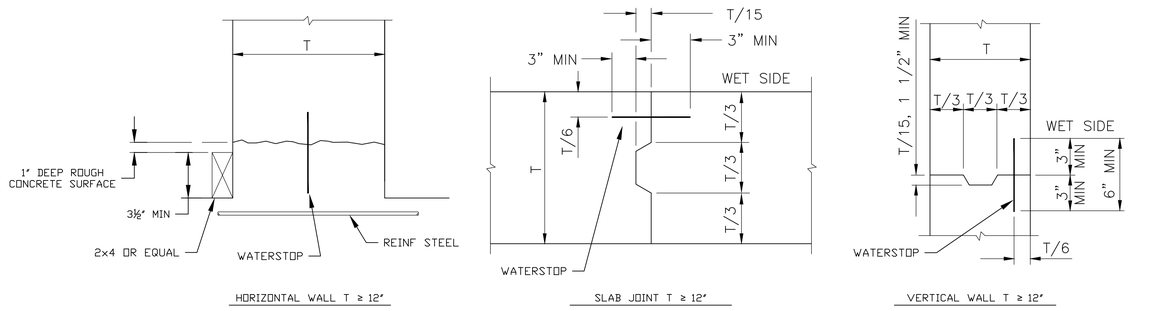
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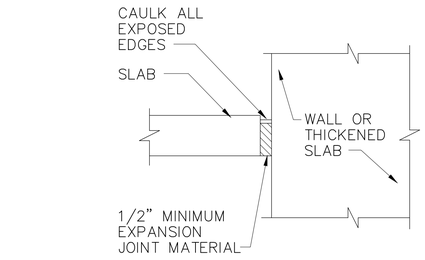
S3

SHEET: 11 of 24

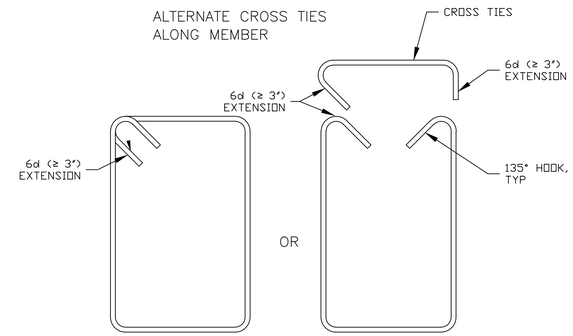


NOTE:
REINFORCING STEEL TO BE CARRIED ACROSS ALL CONSTRUCTION JOINTS

1 S4 TYPICAL CONSTRUCTION JOINTS
Scale: N.T.S.

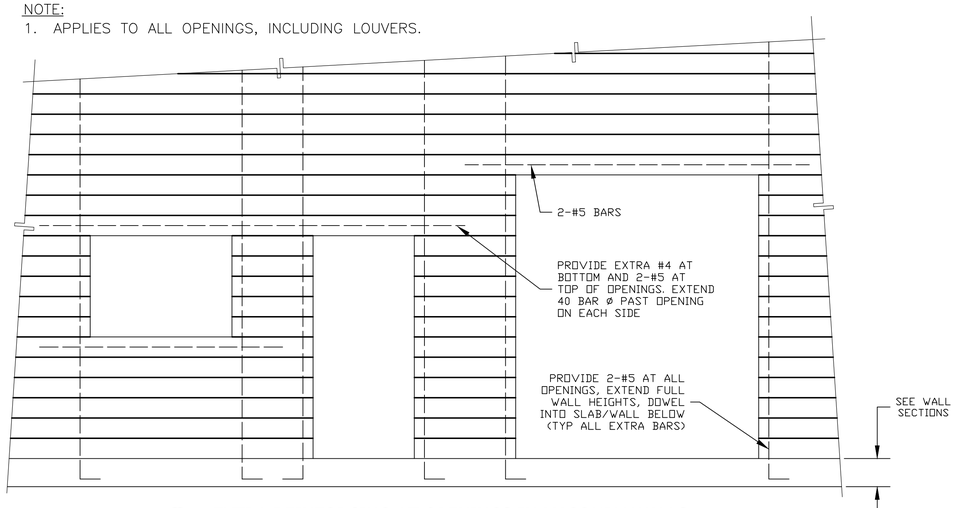


2 S4 SLAB ISOLATION JOINT SECTION
Scale: N.T.S.



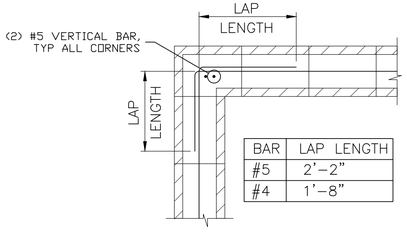
3 S4 STIRRUP DETAIL
Scale: N.T.S.

NOTE:
1. APPLIES TO ALL OPENINGS, INCLUDING LOUVERS.



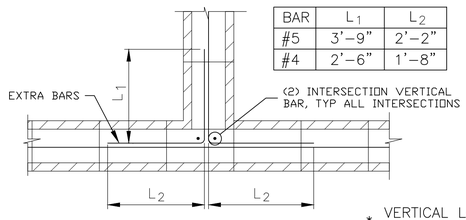
5 S4 EXTRA REINFORCING AT OPENINGS IN MASONRY WALLS
Scale: N.T.S.

EXTRA BARS SAME SIZE AND AT SAME SPACING AS HORIZONTAL STEEL



BAR	LAP LENGTH
#5	2'-2"
#4	1'-8"

SINGLE BAR BOND BEAM



BAR	L_1	L_2
#5	3'-9"	2'-2"
#4	2'-6"	1'-8"

SINGLE BAR BOND BEAM

* VERTICAL LAP FOR:
#6 = 3'-0"
#5 = 2'-6"

4 S4 TYPICAL MASONRY CORNER REINFORCING
Scale: N.T.S.

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7-20-26

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

MASONRY STRUCTURAL DETAILS -1

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY
CALIFORNIA

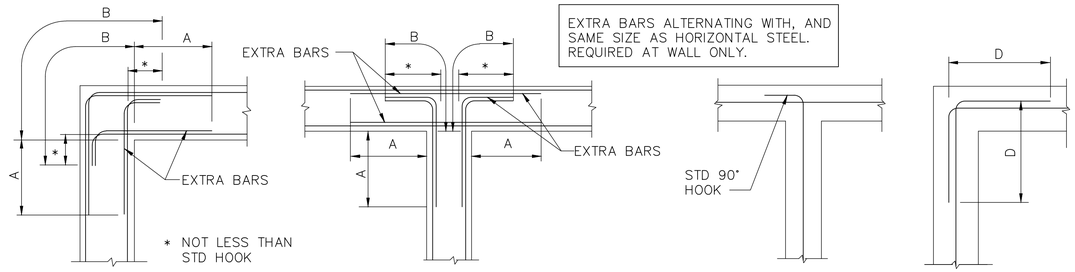
Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

0 1
BAR IS ONE INCH ON ORIG. DRAWING
IF BAR DOES NOT MEASURE ONE INCH, ADJUST SCALES ACCORDINGLY

PROJECT NUMBER:
DESIGN BY:
DRAFTING BY:
CHECKED BY:
FILE PATH:
DATE:
SCALES:
AS SHOWN HORIZONTAL
NA VERTICAL

S4

SHEET: 12 of 24



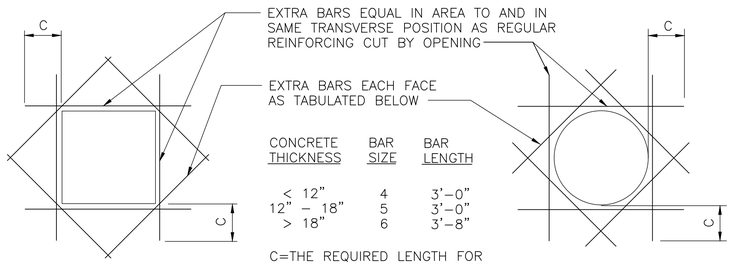
A = 1/5 THE CLEAR SPAN DISTANCE MEASURED HORIZONTALLY OR VERTICALLY WHICHEVER IS THE SMALLER; BUT IN NO CASE LESS THAN THE REQUIRED LENGTH OF LAPPED SPLICES FOR OTHER BARS AS SHOWN ON THIS SHEET.

B = SUFFICIENT LENGTH TO PERMIT BARS TO EXTEND THROUGH THE WALL TO THE OPPOSITE FACE AND TERMINATE IN A STANDARD HOOK BUT SHALL NOT BE LESS THAN THE LENGTH REQUIRED FOR OTHER BARS, LAP SPLICE AS SHOWN ON THIS SHEET.

D = NOT LESS THAN REQUIRED FOR LAP SPLICES FOR OTHER BARS, AS SHOWN ON THIS SHEET.

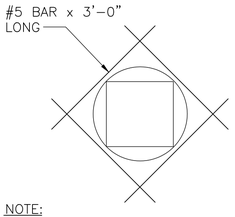
1/S5 TYPICAL CORNER REINFORCING DETAILS

Scale: N.T.S.



FOR RECTANGULAR OPENINGS LARGER THAN 21" DIAGONAL

FOR CIRCULAR OPENINGS LARGER THAN 21" DIAMETER

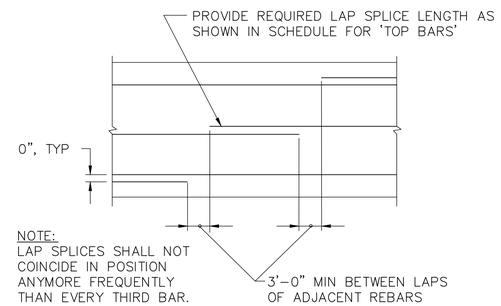


NOTE:
EXTRA BARS NOT REQUIRED AT SLEEVES OR WALL PIPES WHEN REINFORCEMENT IS NOT CUT AND OD IS 10" OR LESS

21" AND SMALLER IN DIAMETER OPENINGS

4/S5 TYPICAL EXTRA REINFORCING AT OPENINGS

Scale: N.T.S.

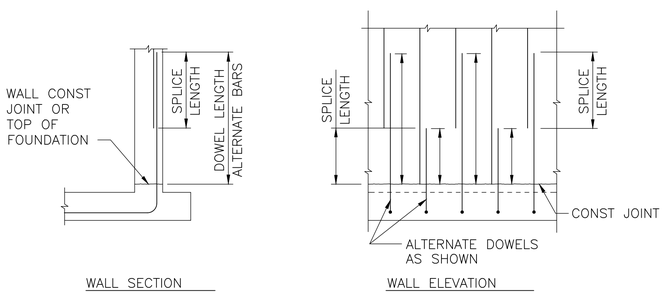


NOTE:
LAP SPLICES SHALL NOT COINCIDE IN POSITION ANYMORE FREQUENTLY THAN EVERY THIRD BAR.

5/S5 HORIZONTAL LAP SPLICE

Scale: N.T.S.

TYPICAL AT ALL HORIZONTAL SPLICES

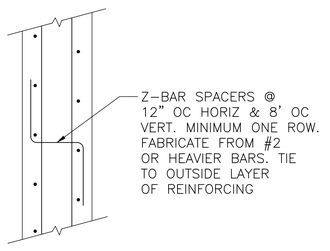


NOTE:
APPLIES AT ALL VERTICAL WALL JOINTS.

6/S5 VERTICAL WALL JOINT REINFORCING DETAIL

Scale: N.T.S.

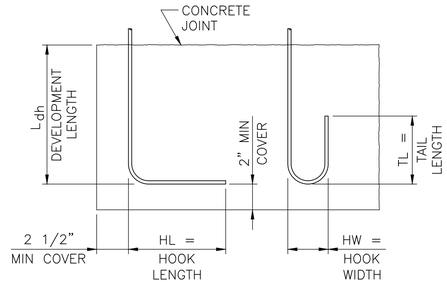
TYPICAL AT ALL VERTICAL SPLICES



7/S5 SPACERS FOR WALL REINFORCEMENT

Scale: N.T.S.

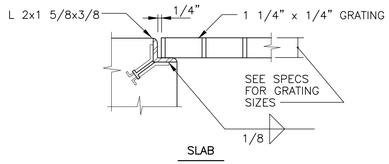
NTS



BAR SIZE GR 60	f'c = 4000 psi			
	L_{dh}	HL	HW	TL
#3	8"	6"	3"	6"
#4	9 1/2"	8"	4"	7"
#5	1'-0"	10"	5"	9"
#6	1'-2 1/2"	1'-0"	6"	10"
#7	1'-5"	1'-2"	7"	12"
#8	1'-7"	1'-4"	8"	14"
#9	1'-9 1/2"	1'-7"	11 3/4"	15"
#10	2'-0 1/2"	1'-10"	1'-1 1/4"	17"
#11	2'-3"	2'-0"	1'-2 3/4"	19"

3/S5 STANDARD END HOOKS

Scale: N.T.S.

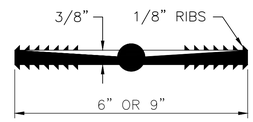


NOTE:
HOT-DIP GALVANIZE ANGLES AFTER FABRICATION.

2/S5 SEAT ANGLE FOR GRATING

Scale: N.T.S.

NOTES:
1. USE 9" WATERSTOP UNLESS NOTED OTHERWISE.
2. WATERSTOP TO BE PVC UNLESS NOTED OTHERWISE.



9/S5 WATERSTOP DETAIL

Scale: N.T.S.

NOTES:

1. TOP BARS ARE HORIZONTAL BARS SO THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAPS AS REQUIRED FOR TOP BARS.
2. UNLESS OTHERWISE NOTED ON THE DRAWINGS, LAP SPLICE LENGTHS, DEVELOPMENT LENGTHS, AND TENSION EMBEDMENT LENGTHS L_{dh} FOR STANDARD END HOOKS SHALL BE NO LESS THAN EMBEDMENT (NO MINUS TOLERANCE) SHOWN BELOW.
3. LAP SPLICES SHALL NOT BE MADE AT POINTS OF MAXIMUM STRESS AS DETERMINED BY THE ENGINEER AND SHALL NOT BE SPACED CLOSER THAN 6" OC, UNLESS NOTED OTHERWISE.
4. IF SIDE COVER IS LESS THAN 2 1/2" OF CONCRETE OR END COVER IS LESS THAN 2" OF CONCRETE MULTIPLY DEVELOPMENT LENGTH L_{dh} FOR STANDARD END HOOKS BY 1.45.

f'c = 4,000 psi, NORMAL WEIGHT

BAR SIZE	LAP SPLICES		DEVELOPMENT LENGTH
	TOP BARS CATEGORY	OTHER BARS CATEGORY	
#3	18"	16"	12"
#4	24"	19"	15"
#5	30"	23"	18"
#6	40"	31"	23"
#7	54"	42"	32"
#8	71"	55"	42"
#9	90"	69"	53"

8/S5 LAP SPLICE AND DEVELOPMENT

Scale: N.T.S.



7-20-26

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MASONRY STRUCTURAL DETAILS -2

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DATE:

SCALES:
AS SHOWN HORIZONTAL
NA VERTICAL

S5

SHEET: 13 of 24

GENERAL

G1 SCOPE

THE GENERAL NOTES AND TYPICAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY. ALL INFORMATION SHOWN ON GENERAL DETAIL DRAWINGS S1 THROUGH S6 MAY NOT NECESSARILY BE REQUIRED TO COMPLETE THE WORK IN THIS CONTRACT.

G2 APPLICABLE SPECIFICATIONS AND CODES

CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE. THE ABOVE SHALL GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR THE FOLLOWING NOTES ARE MORE RESTRICTIVE.

G3 DIMENSIONS

STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

G4 PROVISIONS FOR EQUIPMENT

MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DRAWINGS SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.

G5 CONSTRUCTION LOADS

STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON COMPLETED STRUCTURES. DURING CONSTRUCTION, STRUCTURES SHALL BE PROTECTED BY BRACING AND BALANCING WHEREVER EXCESSIVE CONSTRUCTION LOADS OR INSTABILITY MAY OCCUR.

G6 DESIGN LOADS

THE FOLLOWING LOADS ARE IN ADDITION TO THE DEAD LOADS OF THE STRUCTURE WHICH INCLUDE STRUCTURE SELF WEIGHT, ARCHITECTURAL FINISHES, EQUIPMENT SUPPORTS AND EQUIPMENT.

(I) LIVE LOADS

A. FLOOR AREAS:
(1) SLABS ON GRADES – 250 PSF
(2) OPERATING/EQUIPMENT FLOORS – 150 PSF
(3) ALL OTHER AREAS – 100 PSF

B. *HATCHES IN VAULTS IN TRAFFIC AREAS SHALL BE H20 LOADI RATED, OTHERWISE, GRATINGS, CHECKERED PLATES, AND HATCHES – SAME LOADINGS AS ADJACENT FLOOR AREAS. BUT NOT LESS THAN 100 PSF. DEFLECTION SHALL NOT EXCEED 1/2 INCH OR 1/360 CLEAR SPAN WHICHEVER IS THE SMALLEST.*

C. *ROOF: TOWN OF TRUCKEE GROUND SNOW LOAD = 246 PSF UTILIZING ASCE CHAPTER 7 DESIGN CRITERIA REDUCTIONS, ROOF SNOW LOAD = 182 PSF*

(II) WIND LOAD: TOWN OF TRUCKEE DESIGN CRITERIA: RISK CATEGORY III, EXPOSURE C, I = 1.15; V= 130 MPH

(III) SEISMIC LOAD–RISK CATEGORY III, SITE SOIL CLASS BC

Ss=1.82g	Sms=1.64g	Sds=1.09g
S1=0.510g	Sm1=0.510g	Sd1=0.34g

G7 NOT USED

G8 DRAINAGE SURFACES

SLOPE DRAINAGE SURFACES UNIFORMLY TO DRAIN. SLOPE SHALL BE 1/4" PER FOOT EXCEPT WHERE NOTED OTHERWISE ON THE DRAWINGS. BOTTOM OF SLAB SHALL BE LEVEL AND MAINTAIN A MINIMUM THICKNESS AT FLOOR DRAINS.

G9 FLOOR, ROOF AND SCUPPER DRAINS

SEE ARCHITECTURAL & MECHANICAL DRAWINGS FOR LOCATION & SIZES.

G10 OPENINGS

OPENINGS THRU WALLS AND SLABS FOR PIPES, DUCTS, CONDUITS, ETC. ARE NOT ALL SHOWN ON THE STRUCTURAL DRAWINGS. THE CONTRACTOR SHALL PROVIDE THESE OPENINGS IN ACCORDANCE WITH THE OTHER CONTRACT DRAWINGS. REINFORCEMENT AROUND OPENINGS FOR NEW WALLS AND SLABS SHALL BE PER DETAIL ON S5 UNLESS OTHERWISE SHOWN.

G11 CONSTRUCTION JOINTS

UNLESS OTHERWISE SHOWN, LOCATION OF ALL CONSTRUCTION JOINTS SHALL HAVE THE APPROVAL OF THE ENGINEER.

CONCRETE

C1 APPLICABLE CODE

CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ACI BUILDING CODE (ACI 318).

C2 REINFORCING STEEL DETAILS

ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED SHALL BE IN ACCORDANCE WITH MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUC–

C3 DESIGN STRESSES

A. 1. CONCRETE, f 'c =3,000 PSI ULTIMATE COMPRESSIVE STRESS AT 28 DAYS. UNLESS OTHERWISE NOTED.

2. CONCRETE STRENGTH = 5000 PSI FOR PRECAST PRESTRESSED MEMBERS, MINIMUM.

B. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.

C4 CONCRETE COVER

CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS WITH MINIMUM COVER OF ONE BAR DIAMETER.

A. FOOTINGS AND FOUNDATION MATS CAST ON GROUND – 3".
B. CONCRETE TO BE IN CONTACT WITH LIQUID – 2–1/2".
C. CONCRETE TO BE IN CONTACT WITH GROUND OR WEATHER.
(1) BARS GREATER THAN #5 – 2"
(2) BARS #5 OR LESS – 1–1/2"
D. CONCRETE NOT TO BE EXPOSED TO GROUND, WEATHER, OR LIQUID.
(1) BEAMS AND COLUMNS – 1–1/2"
(2) SLABS, WALLS, AND JOISTS – 1 1/2" OR BAR DIA + 1/4" WHICH EVER IS GREATER.
(3) ALL BARS SHALL BE CLEAR OF ANY ARCHITECTURAL RUSTICATION OR REVEAL – 1"

C5 MINIMUM REINFORCEMENT

CONCRETE CONSTRUCTION SHALL BE REINFORCED CONCRETE EXCEPT WHERE PLAIN CONCRETE IS INDICATED ON THE DRAWINGS. UNLESS OTHERWISE NOTED, MINIMUM REINFORCING STEEL SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING SCHEDULES:

A. SLAB REINFORCEMENT

SLAB THICKNESS	SIZE	SPACING, EW
4"	#4	12"
5" & 6"	#5	12"
8" THRU 10"	#5	12" T&B
12" & 14"	#5	9" T&B
16"	#6	12" T&B

B. WALL REINFORCEMENT

WALL THICKNESS	SIZE	SPACING, EW	POSITION
6" & 8"	#5	9"	ON CENTER LINE
10"	#5	12"	EF
12"	#5	9"	EF
14"	#6	12"	EF
16" THRU 20"	#6	9"	EF

MASS CONCRETE SHALL BE REINFORCED WITH #6 @ 12" EW MINIMUM IN ALL FACES.

C6 WALL AND SLAB REINFORCEMENT DETAIL

UNLESS OTHERWISE NOTED, ALL WALL REINFORCING BARS SHALL BE CONTINUOUS AROUND CORNERS AND THROUGH COLUMNS OR PILASTERS. REINFORCEMENT SHALL BE EXTENDED INTO CONNECTING WALLS, AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING WALLS, AS INDICATED ELSEWHERE ON THIS SHEET OR ON THE DRAWINGS. VERTICAL WALL BARS SHALL BE LAPPED WITH DOWELS FROM BASE SLABS AND EXTENDED INTO THE TOP FACE OF ROOF OR FLOOR SLABS AND LAPPED WITH TOP SLAB REINFORCEMENT. UNLESS INDICATED OTHERWISE, CONTRACTOR MAY SPLICE CONTINUOUS SLAB OR LONGITUDINAL BEAM BARS AT LOCATIONS OF IT'S CHOOSING, EXCEPT THAT TOP BAR SPLICES SHALL BE LOCATED AT MIDSPAN AND BOTTOM BAR SPLICES SHALL BE LOCATED AT SUPPORTS. ALL REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE MINIMUM REQUIREMENT OF C5.

C7 GROUND SUPPORTED SLABS

CONCRETE SLABS SUPPORTED BY GROUND, UNLESS OTHERWISE NOTED, SHALL BE 6" THICK REINFORCED WITH #4@12 EACH WAY AT MID–DEPTH OF SLAB AND DOWELED 5" MINIMUM ALONG THE EDGE OF SLAB TO ALL ADJACENT WALLS, COLUMNS AND FOUNDATIONS. IF SLAB IS DESIGNATED AS "ISOLATED SLAB" ON DRAWINGS, OMIT DOWELS AND SUBSTITUTE 3/8" THICK PREMOLDED JOINT FILLER TO ISOLATE THE SLAB FROM CONTACT WITH THE STRUCTURE ALONG ITS PERIMETER.

C8 CHAMFERS

EXCEPT AS OTHERWISE REQUIRED, EXPOSED CONCRETE CORNERS AND EDGES SHALL HAVE 3/4" CHAMFERS. REENTRANT CORNERS SHALL NOT HAVE FILLETS.

C9 ANCHOR BOLTS

ANCHOR BOLTS SHALL BE DESIGNED PER U.B.C. ALL BOLTS, STUDS AND MISCELLANEOUS METALWORK SHALL BE STEEL UNLESS OTHERWISE NOTED.

MASONRY

M1 APPLICABLE CODE

MASONRY INSTALLATION AND REINFORCING SHALL CONFORM TO ALL THE REQUIREMENTS OF CHAPTER 21 OF THE UNIFORM BUILDING CODE.

M2 SPECIFIED COMPRESSIVE STRENGTH OF MASONRY

COMPRESSIVE STRENGTH OF CMU = 1,900 PSI MIN
MORTAR COMPRESSIVE STRENGTH = 1,800 PSI MIN
GROUT COMPRESSIVE STRENGTH = 2,000 PSI

f'm = 1,500 PSI

M3 MINIMUM REINFORCEMENT (UNLESS NOTED OTHERWISE)

VERTICAL #5@16"
HORIZONTAL #4@32"

EXTRA REINFORCING IS REQUIRED AT OPENINGS, SEE TYPICAL DETAILS

M4 REINFORCING STEEL

ALL REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ASTM A615, GRADE 60, DEFORMED BARS.

M5 MINIMUM COVER

ALL REINFORCING STEEL SHALL HAVE MINIMUM OF 2" COVER INCLUDING THE MASONRY UNIT.

M5 LAP SPLICES

LAP SPLICES SHALL BE 40 BAR DIAMETER OR 24" MINIMUM, OR AS SHOWN ON PLANS, WHICHEVER IS GREATER.

M6 RESTRICTED BAR ANCHORAGE

IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS FAR AS REQUIRED, THE BARS SHALL EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOK.

M7 ANCHOR BOLTS

INSTALLATION AND CAPACITY OF ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH UBC TABLES 21–E–1, 21–E–2, AND 21–F.

M8 SOLID GROUT

SOLID GROUT ALL CELLS.

WOOD

W1 APPLICABLE CODE

ALL ROUGH CARPENTRY AND TRUSSES SHALL CONFORM TO ALL REQUIREMENTS OF THE UNIFORM BUILDING CODE.

W2 STRUCTURAL LUMBER

ALL STRUCTURAL LUMBER SHALL BE DOUGLAS FIR NO. 2 AND BETTER GRADE LUMBER UNLESS OTHERWISE NOTED. GLULAMS SHALL BE DOUGLAS FIR 24F–V4.

W3 ROOF TRUSSES

ROOF TRUSSES SHALL BE PREFABRICATED IN ACCORDANCE WITH DESIGN PREPARED BY THE MANUFACTURER CONFORMING TO THE DESIGN LOADS SHOWN ON THE DRAWINGS AND MEETING OTHER REQUIREMENTS OF THE UNIFORM BUILDING CODE. DESIGN DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED FOR APPROVAL BEFORE FABRICATION. THE SUBMITTAL SHALL BEAR THE SIGNATURE OF A REGISTERED CIVIL ENGINEER LICENSED TO PRACTICE IN CALIFORNIA. THE MANUFACTURER'S DRAWINGS SHALL SHOW ALL TRUSS TO TRUSS CONNECTIONS AND THE LOCATION OF PERMANENT BRACING MEMBERS REQUIRED BY THE TRUSS DESIGN.

W4 WOOD IN CONTACT WITH MASONRY OR CONCRETE

ALL WOOD IN CONTACT WITH MASONRY OR CONCRETE SHALL BE PRESSURE TREATED.

W5 *NAILING SCHEDULE:*

UNLESS OTHERWISE INDICATED ALL NAILING SHALL COMPLY WITH REQUIREMENTS OF 2010 CBC.
(COMMON OR BOX NAILS MAY BE USED UNLESS OTHERWISE NOTED)

INTERIOR PANELING: 8d @ 6" O.C. EDGES, 12" O.C. FIELD

ROOF SHEATHING: 8d @ 6" O.C. EDGES, 12" O.C. FIELD

TOP PLATE TO STUD, END NAIL 2–16d
STUD TO SOLE PLATE 4–8d TOENAIL, OR 2–16d END NAIL
DOUBLED STUDS, FACE NAIL 16d @ 24" O.C.
DOUBLED TOP PLATES, TYPICAL FACE NAIL16d @ 16"
DOUBLE TOP PLATES, LAP SPLICE 8–16d.

W6 *FOUNDATION NOTES:*

ALL NAILING TO P.T. SILL TO BE W/ GALVANIZED OR STAINLESS STEEL NAILS (CBC 2304.9.5)
ANCHOR BOLTS
–FOUNDATION BOLTS TO BE ½" BOLTS @ 48" O.C. MAX W/ 7" MIN. EMBEDME. (CBC 2308.6)
–ALL CAST IN PLACE BOLTS TO HAVE EMBEDDED HEAD OR 'J' BEND INTO CONCRETE
–ALL BOLTS REQUIRE 3" X 3" X ¼" PLATE WASHERS (CBC 2305.3.11)
–POSITION ANCHOR BOLTS WITHIN CENTER 1" ZONE OF P.T. SILL WIDTH.

STEEL

ST1 APPLICABLE CODE

STEEL CONSTRUCTION SHALL CONFORM TO SPECIFICATIONS AND STANDARDS PRESENTED IN THE LATEST EDITION OF AISC STEEL CONSTRUCTION MANUAL.

ST2 MATERIAL

ALL STRUCTURAL SHAPES, BARS, PLATES AND SHEETS INDICATED ON THE DRAWINGS SHALL BE STEEL MEETING ASTM A36 SPECIFICATIONS, UNLESS OTHERWISE NOTED.

ST3 WELDING

WELDING SHALL CONFORM TO AWS CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. WELDER SHALL BE CERTIFIED. WELDING ELECTRODE SHALL BE E70XX, UNLESS SHOWN OTHERWISE ALL WELDS SHALL BE 3/16 INCH MINIMUM.

ST4 CONNECTIONS

BOLTS FOR STRUCTURAL STEEL CONNECTIONS SHALL BE HIGH STRENGTH CONFORMING TO ASTM A–325. UNLESS OTHERWISE NOTED, INSTALLATION OF BOLTS SHALL CONFORM TO AISC SPECIFICATIONS FOR STRUCTURAL JOINTS, USING A325 BOLTS.

ST5 PAINTING

STRUCTURAL STEEL SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH SPECIFICATIONS.

ST6 STAINLESS STEEL

STAINLESS STEEL CONSTRUCTION SHALL BE IN ACCORDANCE WITH AISI SPECIFICATIONS. UNLESS OTHERWISE NOTED, STEEL IN CONTACT WITH SEWAGE SHALL BE AISI TYPE 316 STAINLESS STEEL. WHEN MATERIAL IS WITHIN ONE FOOT HORIZONTALLY OR VERTICALLY OF SEWAGE AISI TYPE 304 STAINLESS SHALL BE USED EXCEPT AS SPECIFIED.

ALUMINUM

A1 APPLICABLE CODE

ALUMINUM CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ALUMINUM CONSTRUCTION MANUAL OF THE ALUMINUM ASSOCIATION.

A2 MATERIAL

UNLESS OTHERWISE INDICATED, STRUCTURAL ALUMINUM SHALL BE ALLOY 6061–T6 AS SPECIFIED IN ASTM B308.

A3 ALUMINUM IN CONTACT WITH DISSIMILAR MATERIALS OR CONCRETE

CONTACT SURFACES SHALL BE COATED WITH HEAVY ALKALI–RESISTANT BITUMINOUS PAINT.

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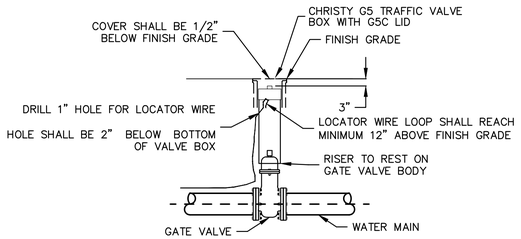
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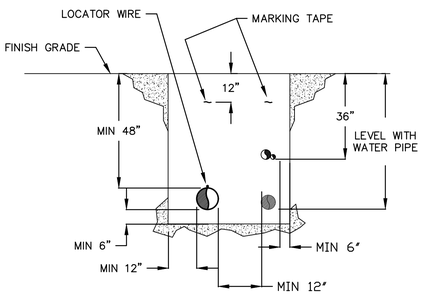
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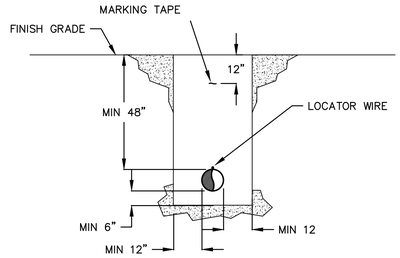
SHEET: 14 of 24



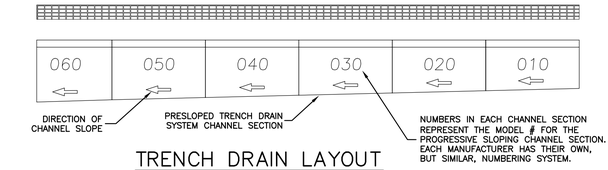
DIMENSIONAL LAYOUT



TRENCH DIMENSIONAL LAYOUT

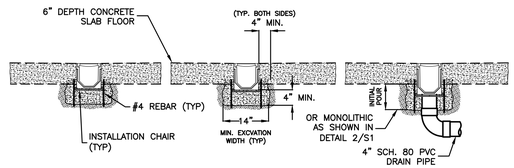


TRENCH DIMENSIONAL LAYOUT



TRENCH DRAIN LAYOUT

SCALE: N.T.S.

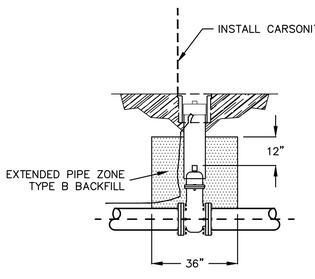


TRENCH DRAIN X-SECTION

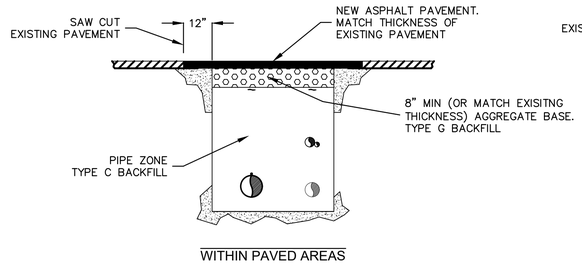
SCALE: N.T.S.

4/D1 TRENCH DRAIN DETAIL

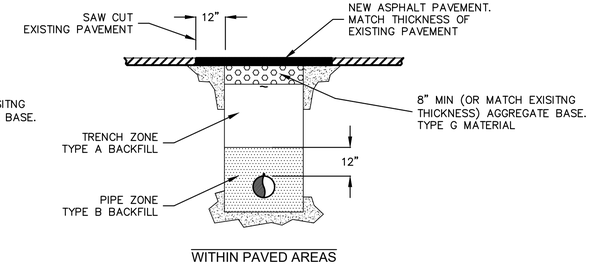
Scale: N.T.S.



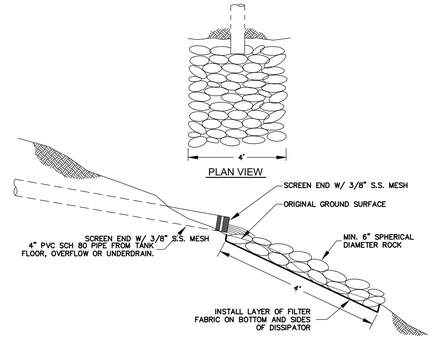
OUTSIDE PAVED AREAS



WITHIN PAVED AREAS

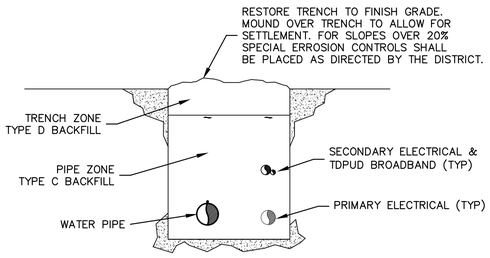


WITHIN PAVED AREAS



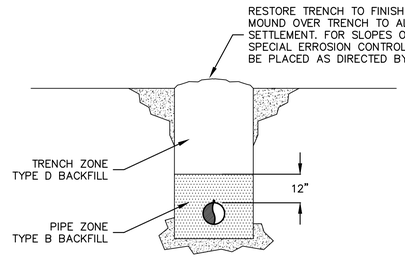
5/D1 DRAINAGE DISSIPATOR DETAIL

Scale: N.T.S.



WITHIN PAVED AREAS

OUTSIDE PAVED AREAS



OUTSIDE PAVED ROADS

1/D1 GATE VALVE DETAIL

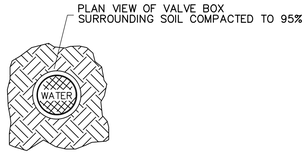
Scale: N.T.S.

3/D1 JOINT TRENCH DETAIL

Scale: N.T.S.

4/D1 WATER MAIN TRENCH DETAIL

Scale: N.T.S.



NOTES:

1. CONTACT ALL AGENCIES AND/OR UTILITIES TO CONFIRM CONSTRUCTION REQUIREMENTS.
2. THE SIDE OF THE TRENCH AT THE WATER PIPE OPPOSITE FROM THE OTHER UTILITIES MUST REMAIN FREE OF ANY OBSTRUCTIONS.

MINIMUM TRENCH WIDTH	
PIPE DIAMETER	WIDTH
4"	30"
6"	30"
8"	32"
10"	34"
12"	36"
14"	38"
FOR PIPE >14", DISTANCE FROM PIPE EDGE TO TRENCH WALL SHALL BE MIN. OF 12"	

REGISTERED PROFESSIONAL ENGINEER
KEITH S. KNUDSEN
No. C 51290
Exp. 3-31-28
CIVIL
STATE OF CALIFORNIA

7-20-26

INITIAL	REVISIONS	REV	DATE

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

PIPING DETAILS

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 202, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

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BAR IS ONE INCH ON ORIG. DRAWING
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PROJECT NUMBER:
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DATE:
SCALES:
AS SHOWN
HORIZONTAL
NA
VERTICAL

D1

SHEET: 15 of 24

ABBREVIATIONS

A	AMPERES
AC	ALTERNATING CURRENT
AICS	AMPERES INTERRUPTING CAPACITY, SYMMETRICAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BC	BARE COPPER
C	CONDUIT
CAT6	CATEGORY 6 CABLE
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
(D)	DEMOLISH
DC	DIRECT CURRENT
DISC	DISCONNECT
DWG	DRAWING
(E)	EXISTING
ES	POWER SOURCE
ELEV	ELEVATION
EXT	EXTERNAL
FLA	FULL LOAD AMPS
G, GND	GROUND
GFCI	GROUND FAULT CURRENT INTERUPTING
GRS	GALVANIZED RIGID STEEL
HH	HANDHOLE
HOA	HAND OFF AUTOMATIC
HP	HORSEPOWER
HR	HOUR
Hz	HERTZ
JB	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
LA	LIGHTING ARRESTOR
LTG	LIGHTING
MA	MILLIAMPERE
MCC	MOTOR CONTROL CENTER
MCB	MAIN CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MIN	MINIMUM
MS	MOISTURE SENSOR
N	NEUTRAL
NC	NORMAL CLOSED
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NO	NORMAL OPEN
O/Ls	OVERLOADS
P	POLE
PB	PULL BOX, PUSH BUTTON
PH, Ø	PHASE
PFR	POWER FAIL RELAY
PLC	PROGRAMMABLE LOGIC CONTROLLER
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
RECP	RECEPTACLE
RGS	RIGID STEEL CONDUIT
RVSS	REDUCED VOLTAGE SOLID STATE
PQM	POWER QUALITY METER
SLS	SEWAGE LIFT STATION
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
SW	SWITCH
TB	TERMINAL BOARD
TDOE	TIME DELAY ON ENERGIZE
TS	TEMPERATURE SWITCH
TSP	TWISTED SHIELDED PAIR
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VAC	VOLTS AC
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH
WP	WEATHERPROOF

ELECTRICAL SYMBOLS - SINGLE LINE DIAGRAM

M	UTILITY METERING
3	CURRENT TRANSFORMER, QUANTITY INDICATED
	POWER TRANSFORMER
100A MCP	CIRCUIT BREAKER OR MOTOR CIRCUIT PROTECTOR 3 POLE UNLESS NOTED
SZ 1 FVNR O/Ls	MAGNETIC MOTOR STARTER, NEMA SIZE INDICATED FVNR=FULL-VOLTAGE NON-REVERSING
	SWITCH
	FUSE
F	DISCONNECT SWITCH "F" INDICATES FUSED, SEE PLANS FOR RATING
15	MOTOR, 15 HORSEPOWER
	GROUND
PFR	POWER FAILURE RELAY
GFR	GROUND FAULT RELAY
	LIGHT FIXTURE
	UTILITY SERVICE POINT
SPD	SURGE PROTECTION DEVICE
N	NEUTRAL BUS OR LUGS
G	GROUND BUS OR LUGS
FA	FIRE ALARM SYSTEM COMPONENTS

TDPUD ELECTRIC NOTES

1. CONTRACTOR MUST CONDUCT AN ON-SITE PRE-CONSTRUCTION MEETING WITH DISTRICT ENGINEERS, ELECTRICIANS, AND ELECTRIC INSPECTORS PRIOR TO CALLING USA NORTH-811 FOR UTILITIES LOCATES.
2. CALL USA NORTH 811 PRIOR TO DIGGING.
3. ALL METERING, SWITCHGEAR, AND TRANSFER SWITCH EQUIPMENT MUST BE APPROVED BY THE DISTRICT'S ELECTRIC ENGINEERING DEPARTMENT PRIOR TO INSTALLATION AND MUST MEET ELECTRIC UTILITY SERVICE EQUIPMENT REQUIREMENTS COMMITTEE (EUSERC) STANDARDS.
4. CONDUCT AN ON-SITE PRE-CONSTRUCTION MEETING WITH ELECTRICAL UTILITY INSPECTOR 48 HOURS IN ADVANCE OF CONSTRUCTION.
5. ALL ELECTRIC UTILITY INFRASTRUCTURE MUST MEET THE DISTRICT'S CONSTRUCTION STANDARDS. ANY FIELD CHANGES MUST BE APPROVED BY AUTHORIZED DISTRICT PERSONNEL. A COPY OF THE DISTRICT'S CONSTRUCTION STANDARDS CAN BE PROVIDED BY DISTRICT PERSONNEL.

ELECTRICAL SYMBOLS - SCHEMATIC DIAGRAMS

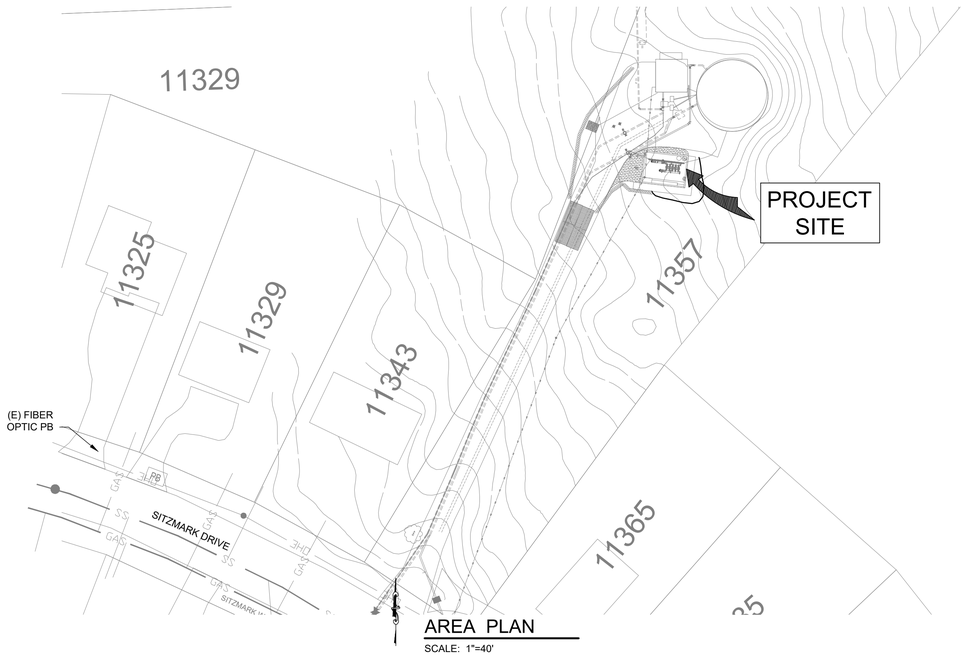
NORMALLY OPEN	NORMALLY CLOSED	DEVICE
		CONTACT
		PUSH BUTTON SINGLE CIRCUIT MOMENTARY CONTACT
		PUSH BUTTON SINGLE CIRCUIT LOCK-OUT
		LIQUID FLOAT LEVEL SWITCH
		PRESSURE OR VACUUM SWITCH
		FLOW SWITCH
		TEMPERATURE SWITCH
		TIME CONTACT CONTACT ACTION RETARDED ON ENERGIZATION
		TIME CONTACT CONTACT ACTION RETARDED ON DE-ENERGIZATION
		SELECTOR SWITCH (H-O-A)
	O/L	MOTOR OVERLOAD RELAY CONTACT
O/L		MOTOR OVERLOAD HEATER
A		PILOT LIGHT R=RED, W=WHITE G=GREEN, A=AMBER
R		PILOT LIGHT-PUSH TO TEST
R		RELAY
TD		TIME DELAY RELAY
M		STARTER COIL
SV		SOLENOID OPERATED VALVE
		MOTOR
		FUSE
		CONTROL POWER TRANSFORMER
		GROUND
		WIRING IN MOTOR STARTER OR CONTROL PANEL
		FIELD WIRING
		WIRE TERMINAL
PFR		PHASE/POWER FAILURE RELAY
		SPACE HEATER
		RESISTOR
		CIRCUIT BREAKER

ELECTRICAL SYMBOLS - PLANS

CLG.	WALL	FLR.	SYMBOLS DESCRIPTION
			DUPLEX RECEPTACLE
	J		JUNCTION BOX
			AREA LIGHT AND POLE
P021G			FEEDER DESIGNATION SEE SCHEDULE FOR SIZE
			CONDUIT IN SLAB OR UNDER CONCRETE CAP, THREE CONDUITS OR LESS
			CONCRETE ENCASED DUCT BANK FOUR CONDUITS OR MORE
			CONDUIT EXPOSED
			GROUNDING CONDUCTOR 30" BELOW GRADE, #4/0 U.O.N.
			EXOTHERMIC WELD CONNECTION
			CONDUIT BENDS TOWARD OBSERVER
			CONDUIT BENDS AWAY FROM OBSERVER
			CONDUIT STUB-OUT AND CAPPED
			FLEXIBLE CONDUIT CONNECTION
			CONDUIT SEAL (HAZARDOUS LOCATION)
			MOTOR
			GROUND ROD, 3/4" x 10'-0"WITH GROUND WELL. SEE DETAIL,
X E-Y			DETAIL CALLOUT- X, DETAIL IDENTIFIER. Y- SHEET WHERE DETAIL IS DRAWN
J			JUNCTION BOX OR PULLBOX
(E)			EXISTING TO REMAIN
(RS)			EXISTING TO BE REMOVE AND SALVAGED.
(D)			EXISTING TO BE DEMOLISHED.
S			SMOKE DETECTOR
ZS			INTRUSION SWITCH

DESCRIPTION	PHASE/CODE LETTER	FIELD WIRE OR TAPE COLOR	NON-FIELD WIRE COLOR	WIRE SIZE
480V 3ϕ	A	BROWN	BROWN	PER DRAWING
	B	ORANGE	ORANGE	
	C	YLW	YLW	
	NEUTRAL	GREY	GREY	
240V/208 3ϕ	A	BLK	BLK	
	B	RED (ORG IF HIGH LEG)	RED	
	C	BLU	BLU	
120V 1ϕ (HOT)	NON UPS	BLK	BLK	
	UPS	BLK/RED STRIPE	BLK/RED STRIPE	
NEUTRAL	NON UPS	WHT	WHT	
	UPS	WHT/YLW STRIPE	WHT/YLW STRIPE	
+24VDC	+24VDC	RED	RED	
-24VDC	-24VDC	BLU/RED STRIP	BLU/RED STRIP	
+12VDC	+12VDC	ORG	ORG	
-12VDC	-12VDC	BLUE/ORG STRIPE	BLUE/ORG STRIPE	
AC CONTROL		PNK	PNK	
DC CONTROL		DARK BLUE/WHITE W/BLUE STRIPE	(FOREIGN CIRCUITS YLW)	
AC CONTROL EXTERNAL SOURCE		YELLOW		
EXTERNAL SOURCE NEUTRAL		WHITE W/YELLOW STRIPE		
DC CONTROL EXTERNAL SOURCE		YELLOW W/BLUE STRIPE		
GROUND	G	GREEN	GREEN	
SHIELDED PAIR	+	WHT OR CLEAR	WHT OR CLEAR	
	-	BLK	BLK	
INTRINSICALLY SAFE	IS	LIGHT BLU	LIGHT BLU	

NOTE: ALL CONTROL PANEL WIRING TO BE MTW STRANDED ONLY.
WIRE COLOR CHART IN ACCORDANCE WITH UL 508A 66.5.2, 66.9.1,
& EXCEPTION #2 OF 66.9.1.



AREA PLAN
SCALE: 1"=40'

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

ELECTRICAL SYMBOLS, ABBREVIATIONS AND AREA PLAN

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 201, Nevada City, CA 95959
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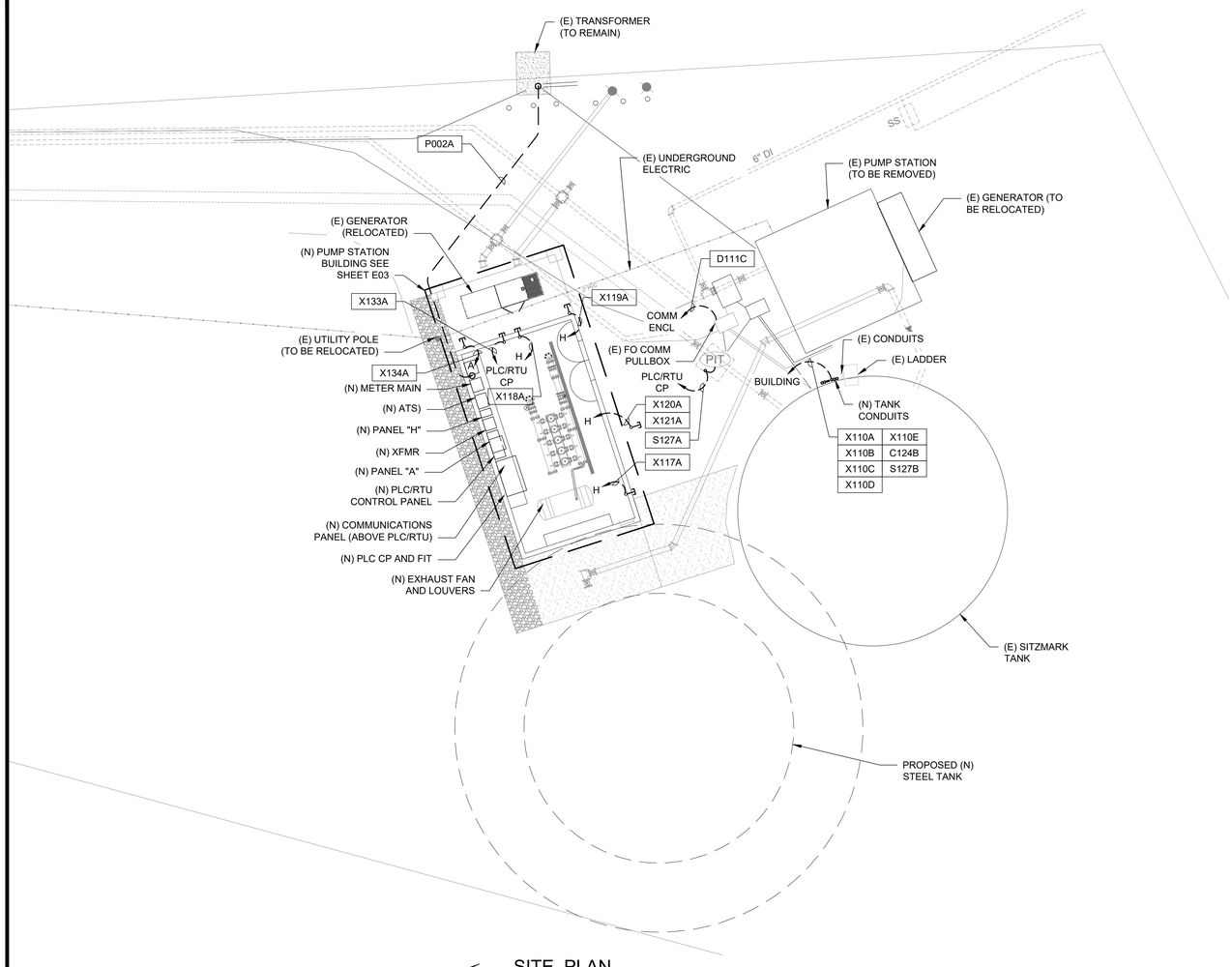
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DATE:	
SCALES: HORIZONTAL	E01
VERTICAL	
SHEET:	16 of 24

USA NORTH 811 Call 811 Before You Dig



ECS
ECS Engineering, Inc.
916-718-3686
samterry@earthlink.net

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SITE PLAN

SCALE: 1"=10'

NOTES

1. COORDINATE NEW ELECTRIC SECONDARY SERVICE CONDUIT AND INSTALLATION OF METER/MAIN ENCLOSURE WITH DISTRICT. IT IS EXPECTED THE EXISTING TRANSFORMER AND PAD WILL BE RE-USED.
2. REUSE AND RELOCATE EXISTING GENERATOR. PROVIDE NEW PAD. PROVIDE RE-START-UP SERVICES AND CHECK-OUT DURING FACILITY START-UP.
3. IN THE EXISTING PUMP STATION BUILDING AND AROUND THE PERIMETER, AS PART OF THE DEMOLITION WORK, SAFELY REMOVE ALL ELECTRICAL EQUIPMENT ABOVE GRADE AND IN THE BUILDING AND PROPERLY DISPOSE OF IT. LEAVE EVERYTHING NOT DEMO'D IN A SAFE CONDITION.
4. COORDINATE THE INSTALLATION OF NEW CONDUIT ON THE EXISTING TANK WITH THE DISTRICT. THE EXISTING CONDUIT SHALL REMAIN IN PLACE (AND IN SERVICE UNTIL SWITCHOVER). MEET WITH ENGINEER ON SITE TO DISCUSS MINIMIZING THE SAW CUTTING OF THE APRON AROUND THE TANK. REPAIR THE APRON. PAINT NEW CONDUIT AND MOUNTING HARDWARE TO MATCH THE TANK.
5. THE CONTRACTOR SHALL PROVIDE AND INSTALL A 2" DIAMETER COMM CONDUIT (PVC 40 BELOW GRADE AND RIGID STEEL AT ELBOW BELOW FOUNDATION AND IN BUILDING WHERE EXPOSED WITH PULLROPE) BETWEEN THE EXISTING FO PULLBOX AND THE NEW COMM ENCLOSURE.
6. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF 360 FEET OF EXISTING 12 STRAND FIBER-OPTIC CABLE BETWEEN THE FO COMM BOX ON SITE AND A SIMILAR PULLBOX DOWN THE STREET. THE CONTRACTORS SHALL PROVIDE AND INSTALL NEW 12 STRAND SINGLE MODE FIBEROPTIC CABLE BETWEEN THE EXISTING COMM BOX DOWN THE STREET (USING NEW AND EXISTING CONDUIT) AND THE NEW COMM ENCLOSURE (USING NEW CONDUIT) IN THE NEW BUILDING ON SITE. THE CONTRACTOR SHALL SPLICE THE NEW CABLE STRANDS TO EXISTING STRANDS IN THE COMM PULLBOX DOWN THE STREET. THE CONTRACTOR SHALL TERMINATE THE NEW STRANDS IN THE NEW FIBER ENCLOSURE IN THE BUILDING. THE CONTRACTOR SHALL TEST THE FIBER.

CONDUIT SCHEDULE

CONDUIT NUMBER	SIZE	RUN FROM	RUN TO	LOCATION SERVED	CKT TYPE	CKT VOLTS	NO CKT WIRES	CKT WIRE TYPE	CKT WIRE SIZE	GND WIRE TYPE	GND WIRE SIZE	NOTES
P002A	3"	TDPUD	METER/MAIN/PS	BPS	P		1	Pullrope				PROVIDE PER TDPUD
P003A	2-1/2"	ATS	METER/MAIN/PS	BPS	P	480	4	THWN	4/0	THWN	1	
P004A	2"	ATS	GENERATOR	BPS	P	480	4	THWN	2/0	THWN	2	
C004C	1"	ATS	GENERATOR	BPS	C	120	4	THWN	14	THWN	14	
P004D	2-1/2"	ATS	PANEL H	BPS	P	480	4	THWN	4/0	THWN	1	
P004E	3/4"	PANEL A	GEN HEAT	BPS	P	120	2	THWN	10	THWN	12	
P004F	3/4"	PANEL A	BATTERY CHR	BPS	P	120	4	THWN	12	THWN	12	
C004G	3/4"	ATS	CONTROL PANEL	BPS	C	120	6	THWN	14	THWN	14	ATS AND POWER STATUS
C004H	3/4"	GENERATOR	CONTROL PANEL	BPS	C	120	10	THWN	14	THWN	14	GENERATOR STATUS
P100A	2"	PUMP CP	PANEL H	BPS	P	480	3	THWN	2/0	THWN	4	PUMP CP POWER FEEDR
S100B	1-1/4"	PUMP CP	PLC/RTU CP	BPS	S	24	2	TSP	18	THWN	14	FLOW STATUS
D100C	1-1/4"	PUMP CP	PLC/RTU CP	BPS	D		1	CAT 5				NETWORK CONNECTION
P100D	3/4"	PANEL A	PLC/RTU CP	BPS	P	120	2	THWN	12	THWN	12	PLC/RTU CP POWER FEEDER
C100E	1"	PUMP CP	PLC/RTU CP	FUTURE	C	120	20	THWN	14	THWN	14	PUMP CP STATUS (20 SPARES)
P101A	1"	PUMP CP	PUMP NO. 1	BPS	P	480	3	THWN	8	THWN	10	MOTOR POWER FEEDER
C101B	3/4"	PUMP CP	PUMP NO. 1	BPS	C	120	4	THWN	14	THWN	14	TEMP SWITCH AND LOS
P102A	1"	PUMP CP	PUMP NO. 2	BPS	P	480	3	THWN	8	THWN	10	MOTOR POWER FEEDER
C102B	3/4"	PUMP CP	PUMP NO. 2	BPS	C	120	4	THWN	14	THWN	14	TEMP SWITCH AND LOS
P103A	1"	PUMP CP	PUMP NO. 3	BPS	P	480	3	THWN	8	THWN	10	MOTOR POWER FEEDER
C103B	3/4"	PUMP CP	PUMP NO. 3	BPS	C	120	4	THWN	14	THWN	14	TEMP SWITCH AND LOS
P104A	1"	PUMP CP	PUMP NO. 4	BPS	P	480	3	THWN	8	THWN	10	MOTOR POWER FEEDER
C104B	3/4"	PUMP CP	PUMP NO. 4	BPS	C	120	4	THWN	14	THWN	14	TEMP SWITCH AND LOS
P105A	1"	PUMP CP	PUMP NO. 5	BPS	P	480	3	THWN	8	THWN	10	MOTOR POWER FEEDER
C105B	3/4"	PUMP CP	PUMP NO. 5	BPS	C	120	4	THWN	14	THWN	14	TEMP SWITCH AND LOS
P106A	3/4"	PANEL H	TRANSFORMER	BPS	P	480	2	THWN	12	THWN	12	TRANSFORMER FEEDER
P106B	1"	PANEL A	TRANSFORMER	BPS	P	240	3	THWN	8	THWN	10	PANELBOARD FEEDER
X110A	1"	POWER WIREWAY	EXISTNG TANK	EXISTING TANK			1	Pullrope				SPARE - CAP FOR FUTURE
X110B	1"	POWER WIREWAY	EXISTNG TANK	EXISTING TANK			1	Pullrope				SPARE - CAP FOR FUTURE
X110C	2"	PLC/RTU CP	EXISTNG TANK	EXISTING TANK			1	Pullrope				SPARE - CAP FOR FUTURE
X110D	2"	PLC/RTU CP	EXISTNG TANK	EXISTING TANK			1	Pullrope				SPARE - CAP FOR FUTURE
X110E	2"	COMM ENCL	EXISTNG TANK	EXISTING TANK			1	Pullrope				SPARE - CAP FOR FUTURE
P111A	3/4"	COMM ENCL	PANEL A	BPS	P	120	2	THWN	12	THWN	12	COMM ENCL RECPT. FEEDER
D111B	2"	COMM ENCL	PLC/RTU CP	BPS	D		1	CAT 6				
D111C	2"	COMM ENCL	(E) COMM PULLBOX		D		1	12 S	FO			
P115A	3/4"	PANEL H	HEATER CON	BPS	P	480	3	THWN	10	THWN	8	HEATER POWER FEED
C115B	3/4"	T-STAT	HEATER CON	BPS	C	120	4	THWN	14	THWN	14	THERMOSTAT
P116A	3/4"	PANEL H	FAN	BPS	P	120	3	THWN	12	THWN	12	FAN
C116B	3/4"	T-STAT	FAN	BPS	C	120	4	THWN	14	THWN	14	THERMOSTAT
X117A	1"	PANEL H	STUB-UP	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
X118A	1"	PANEL H	STUB-UP	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
X119A	1"	PANEL H	STUB-UP	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
X120A	1"	PANEL H	STUB-OUT	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
X121A	1"	PANEL H	STUB-OUT	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
P122A	1"	PANEL H	AIR COMPRESSOR	BPS	P	480	3	THWN	10	THWN	10	AIR COMPRESSOR FEEDER
C122B	1"	PLC/RTU CP	COMP CP	BPS	C	120	4	THWN	14	THWN	14	COMPRESSOR STATUS
C122C	1"	PLC/RTU CP	HYDROTANK	BPS	C	120	4	THWN	14	THWN	14	SPARES
C122D	1"	AIR COMPRESSOR	HYDROTANK	BPS	C	120	4	THWN	14	THWN	14	TANK STATUS
P123A	3/4"	PANEL A	SMOKE DETECTOR	BPS	P	120	2	THWN	12	THWN	12	SMOKE DETECTOR POWER
C123B	3/4"	PLC/RTU CP	SMOKE DETECTOR	BPS	C	120	2	THWN	14	THWN	14	SMOKE DETECTOR STATUS
C124A	3/4"	PLC/RTU CP	STAT INTRUSION SW	BPS	C	120	2	THWN	14	THWN	14	INTRUSION SWITCH STATUS
C124B	3/4"	PLC/RTU CP	TANK INTRUSION SW	BPS	C	120	2	THWN	14	THWN	14	INTRUSION SWITCH STATUS
S127A	1"	PLC/RTU CP	EXISTING PIT-90	BPS	S	24	1	TSP	16	THWN	14	SYSTEM SUCTION PRESSURE
S127B	1"	PLC/RTU CP	EXISTING PIT-91	BPS	S	24	1	TSP	16	THWN	14	TANK PRESSURE/LEVEL
S128A	1"	PUMP CP	PIT-100	BPS	S	24	1	TSP	16	THWN	14	SKID SYSTEM PRESSURE
S129A	1"	PUMP CP	PIT-110	BPS	S	24	1	TSP	16	THWN	14	SYSTEM PRESSURE
X133A	1"	PLC/RTU CP	STUB-UP	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
X134A	1"	PANEL A	STUB-UP	FUTURE			1	Pullrope				SPARE - CAP FOR FUTURE
P135A	3/4"	PANEL A	BUILDING RECPTS	BPS	P	120	2	THWN	12	THWN	12	RECEPTACLE POWER
P135B	3/4"	PANEL A	BUILDING RECPTS	BPS	P	120	2	THWN	12	THWN	12	RECEPTACLE POWER
P135C	3/4"	PANEL A	BUILDING LIGHTS	BPS	P	120	6	THWN	12	THWN	3X12	BUILDING LIGHTING POWER
P154A	3/4"	PANEL A	FIT-111	BPS	P	120	2	THWN	12	THWN	12	FLOWMETER POWER
S154B	1-1/4"	FE-111	FIT-111	BPS	S		2	PER	MFG			FLOW SIGNAL
S154C	1"	PLC/RTU CP	FIT-111	BPS	S	24	1	TSP	18	THWN	14	FLOW SIGNAL

IDENTIFIES THE TYPE OF CIRCUIT BEING SERVICED			
C=	CONTROL	P=	POWER
S=	INSTRUMENT SIGNAL	T=	TELEPHONE
D=	DATA	X=	SPARE

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SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

ELECTRICAL SITE PLAN

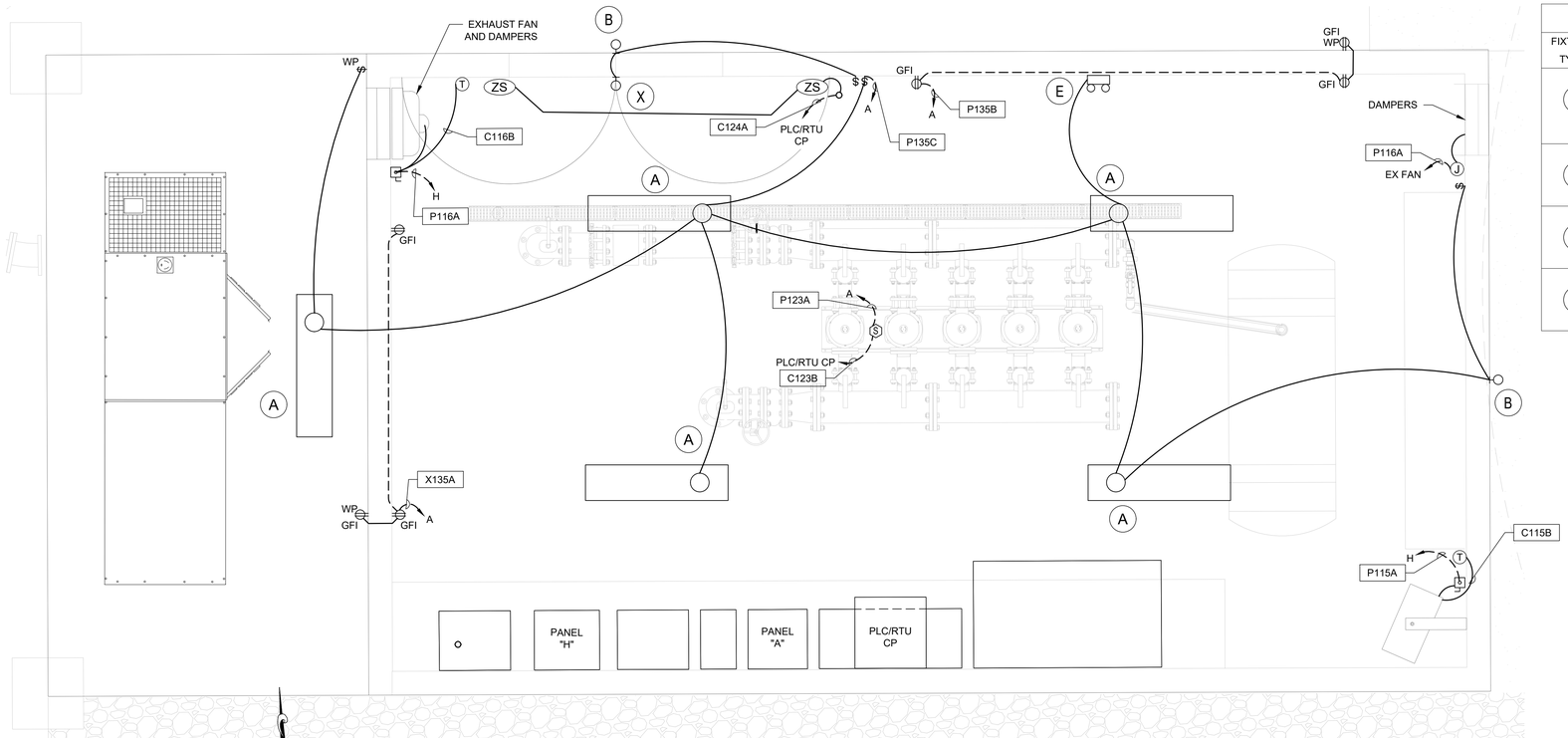
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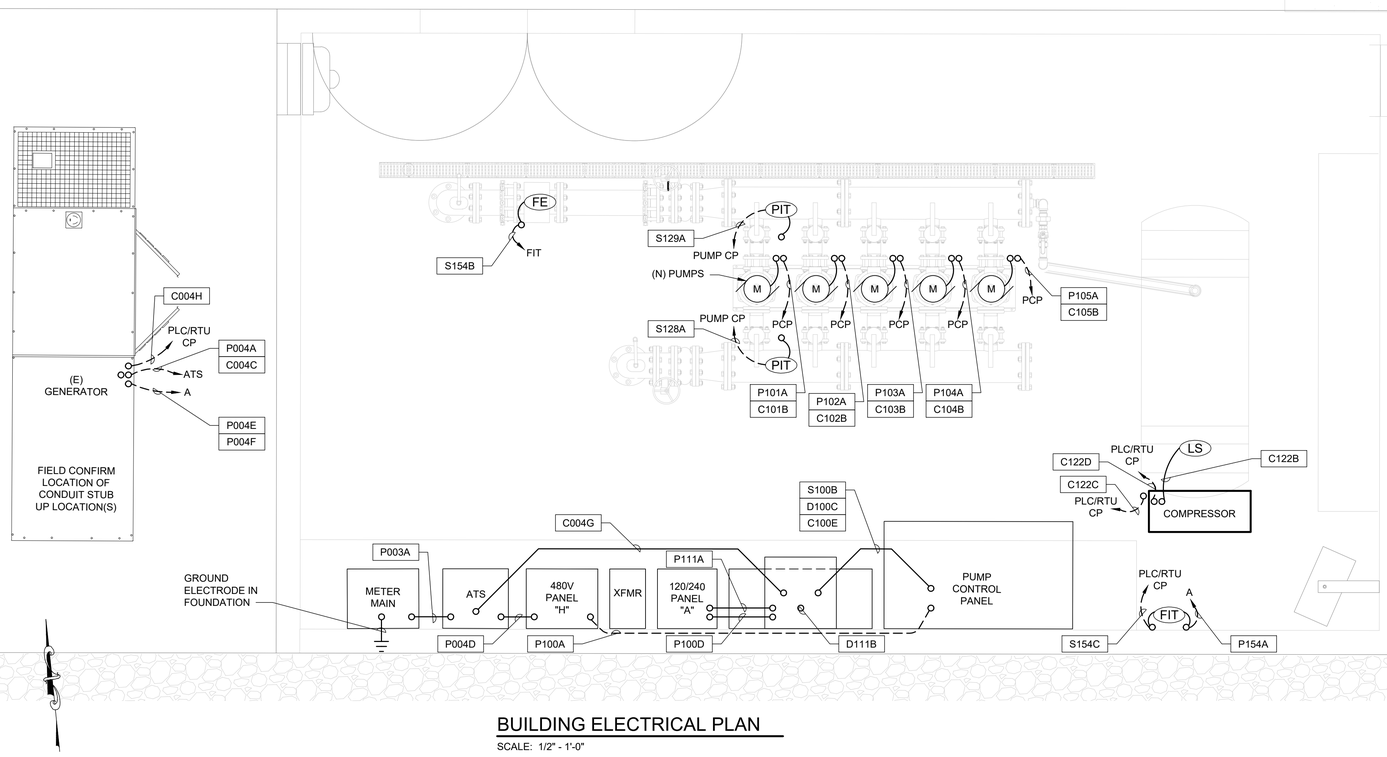
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VERTICAL	
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BUILDING LIGHTING PLAN

SCALE: 1/2" = 1'-0"



BUILDING ELECTRICAL PLAN

SCALE: 1/2" - 1'-0"

FIXTURE SCHEDULE

FIXTURE TYPE	LAMP QTY.	LAMP TYPE	LAMP WATTS	1Ø VOLTS	MOUNTING	DESCRIPTION	CATALOG NUMBER
A	4	LED	61	120	SURFACE	ENCLOSED INDUSTRIAL, DAMP AREA, 4000K LED	LITHONIA FEML484LIMAFLMD MVOLTGZ1040K80CRI
B	2	LED	45	120	OUTSIDE WALL ABOVE DOORS	BLDG. WALL PACK W/ BRONZE FINISH, 4000K LED	LITHONIA TWPLED20CT3M 120PEWGDDBXD
E	1	LED	10	120	WALL MOUNT 9' AFF	EMERGENCY BATTERY PACK	LITHONIA ELM6LUVOLTLTPSDRTEHO
X	1	LED	1	110	WALL ABOVE DOOR	EXIT LIGHT	LITHONIA LQMS3120

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SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

BUILDING ELECTRICAL PLAN

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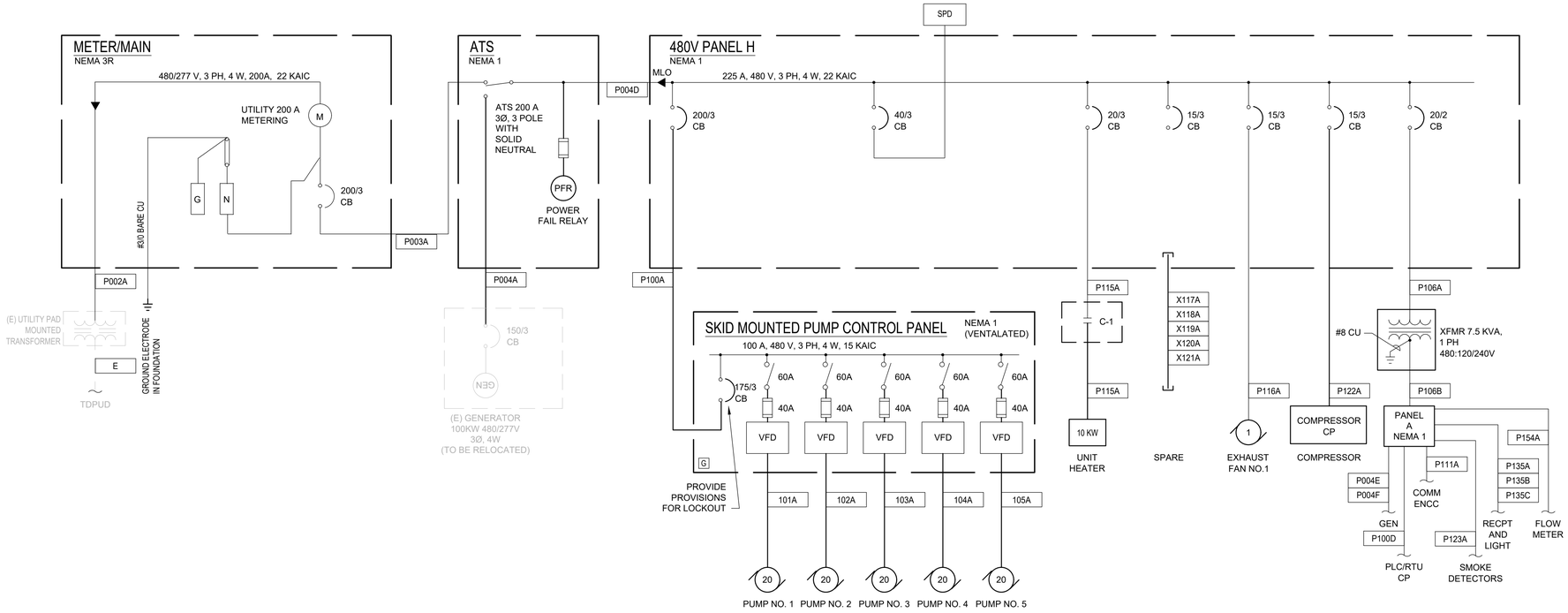
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SINGLELINE DIAGRAM

NOT TO SCALE

PANELBOARD "A" WITH SPD

LOCATION: PUMP BUILDING
MOUNTING: WALL
ENCLOSURE NEMA TYPE: 1
VOLTAGE: 120/240
AIC RATING: 10,000
FED FROM (SOURCE): TRANSFORMER

PANEL AMP RATING: 100
PANEL PHASES: 1
PANEL WIRES: 3
MAIN LANDING TYPE: CB
MCB TRIP RATING: 35
MCB FRAME SIZE: 100

CKT NO.	CIRCUIT DESCRIPTION	TRIP (AMPS)	POLE	PHASE A (VA)	PHASE B (VA)	PHASE A (VA)	PHASE B (VA)	POLE	TRIP (AMPS)	CIRCUIT DESCRIPTION	CKT NO.
1	PLC/RTU CONTROL PANEL	20	1	600		500		1	20	EXHAUST FAN & LOUVERS	2
3	P/R CP LIGHTS/FAN/HEATER	20	1		300		60	1	20	EXTERIOR LIGHTS	4
5	COMM ENCLOSURE	20	1	180		20		1	20	E LIGHTS	6
7	FLOWMETER	15	1		40		80	1	20	BUILDING LIGHTS	8
9	SPARE	15	1	0		360		1	20	BUILDING RECEPTACLES	10
11	SPARE	30	2		0		360	1	20	BUILDING RECEPTACLES	12
13				0		1000		2	25	GENERATOR HEATER	14
15	SPARE	20	1		0		1000				16
17	SPARE	20	1	0		100		1	20	GENERATOR BATTERYY CHARGER	18
19	SPARE	20	1		0		20	1	20	SMOKE DETECTOR	20
21	SPARE	20	1	0		0		1	20	SPARE	22
23	SAPRE	20	1		0		0	1	20	SPARE	24
	TOTAL LOAD PER PHASE PER SIDE (VA)			780.00000	340.00000	1980.00000	1520.00000				
	TOTAL CONNECTED LOAD PER PHASE (VA)			2760.00000	1860.00000					SURGE PROTECTION DEVICE	
	TOTAL CONNECTED LOAD (VA)			4620.00000							
	LOAD (AMPS)			19							

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	160	1	160.00000
MOTORS	0	1	0.00000
OTHER	4460.00000	1	4460.00000
TOTAL DEMAND LOAD			4620.00000
TOTAL DEMAND CURRENT			19

LOAD CALCULATION

METER/MAIN	UTILITY	GEN	STEP
PUMP NO. 1 (PUMP CONTROL PANEL)	27.0 AMPS	27.0 AMPS	2
PUMP NO. 2 (PUMP CONTROL PANEL)	27.0 AMPS	27.0 AMPS	3
PUMP NO. 3 (PUMP CONTROL PANEL)	27.0 AMPS	27.0 AMPS	4
PUMP NO. 4 (PUMP CONTROL PANEL)	27.0 AMPS	27.0 AMPS	
STANDBY PUMP NO. 5 (PUMP CONTROL PANEL)	0.0 AMPS	0.0 AMPS	
UNIT HEATERS	12.0 AMPS	12.0 AMPS	
PANEL A	10.0 AMPS	10.0 AMPS	1
25% OF LARGEST MOTOR	8.0 AMPS		
TOTAL LOAD (KVA)	138.0 AMPS	130.0 AMPS	

⚠ WARNING

ARC FLASH & SHOCK HAZARD

APPROPRIATE PPE AND TOOLS REQUIRED WHEN WORKING ON THIS EQUIPMENT

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

SINGLELINE DIAGRAM

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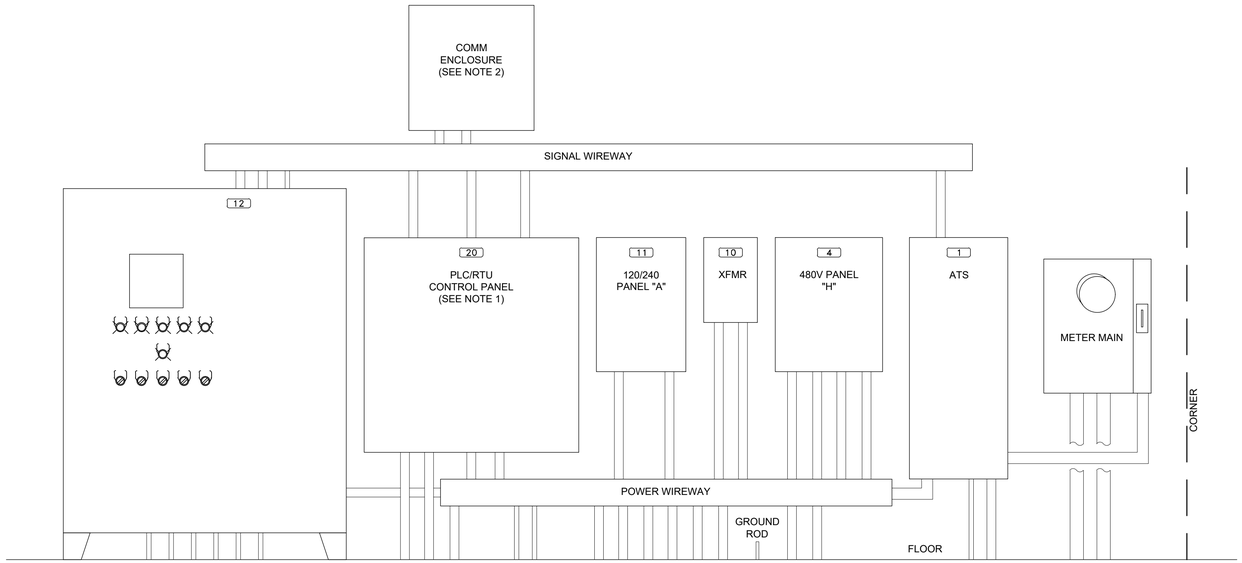
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MCC ELEVATION

SCALE: NONE

NOTES

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE PLC/RTU CONTROL PANEL ENCLOSURE AND BACK PANEL. COORDINATE THE DELIVERY OF THE BACK PANEL TO THE DISTRICT. THE DISTRICT WILL PROVIDE AND INSTALL THE RTU, TERMINAL BLOCKS AND WIRING BETWEEN THE RTU AND TERMINAL BLOCKS ON THE BACK PANEL AT THEIR FACILITY AND RETURN IT TO THE SITE. THE CONTRACTOR WILL RE-INSTALL THE BACK PANEL IN THE ENCLOSURE. THE CONTRACTOR SHALL EXPECT SOME COORDINATION WILL BE REQUIRED TO FACILITATE THIS WORK. THE CONTRACTOR SHALL BE ON SITE DURING TESTING AND START-UP TO ASSIST. REFERENCE DRAWING E06 FOR ADDITIONAL INFORMATION REGARDING DISTRICT PROVIDED EQUIPMENT.
2. THE CONTRACTOR SHALL PROVIDE AND INSTALL COMM ENCLOSURE ABOVE THE PLC/RTU CONTROL PANEL ENCLOSURE: HOFFMAN PTHS242824G4. THE CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES AND SEQUENCE WITH THE DISTRICT, ON SITE, WEEKS BEFORE TESTING STARTS. THE CONTRACTOR SHALL INSTALL A SURFACE MOUNTED BACKBOX, RECEPTACLE AND COVER PLATE IN THE COMM ENCLOSURE AS DIRECTED ON SITE BY THE DISTRICT. THE CONTRACTOR SHALL INSTALL A FIBER MANAGEMENT ENCLOSURE INSIDE THE CABINET AND TERMINATE ALL STRANDS IN IT AS DIRECTED BY THE DISTRICT. THE DISTRICT'S IT DEPARTMENT WILL INSTALL A RACK, DIVIDER PLATE, CABLE MANAGEMENT, PATCH CABLES, NETWORK SWITCHES, ROUTER AND POE POWER SUPPLY IN THE ENCLOSURE. THE CONTRACTOR SHALL EXPECT SOME COORDINATION WILL BE REQUIRED TO FACILITATE THIS WORK.
3. THE CONTRACTOR SHALL PROVIDE AND INSTALL A 2" DIAMETER COMM CONDUIT (PVC 40 BELOW GRADE AND RIGID STEEL AT ELBOW BELOW FOUNDATION AND IN BUILDING WHERE EXPOSED WITH PULLROPE) BETWEEN THE EXISTING FO PULLBOX AND THE NEW COMM ENCLOSURE. THE CONTRACTORS SHALL EXTEND THE EXISTING FO SYSTEM (12 STRAND CABLE) TO THE NEW COMM ENCLOSURE BY SPLICING TO EXISTING STRANDS IN THE EXISTING FO PULLBOX (DOWN THE STREET). THE CONTRACTOR SHALL TEST THE FIBER.
4. PROVIDE AND INSTALL GALVANIZED STEEL VERTICAL CHANNEL STRUT (1-5/8") BEHIND WIREWAYS (PROVIDE ENOUGH ROOM FOR 1" DIAMETER CONDUIT TO FIT BEHIND WIREWAYS).
5. IN GENERAL, THE POWER WIREWAY CAN BE USED FOR CONDUCTORS SHOWN IN POWER CONDUITS. SIMILARLY, THE SIGNAL WIREWAY CAN BE USED FOR LOW VOLTAGE SIGNAL AND CONTROLS CONDUCTORS WHERE SHOWN IN SIGNAL AND CONTROL CONDUITS: PROVIDE A DIVIDER FOR SIGNAL CONDUCTORS IN THE SIGNAL WIREWAY.
6. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE DCU ON THE TANTULUS FOR POWER UTILITY.

NAMEPLATE SCHEDULE

NO.	LETTER SIZE	INSCRIPTION	NO.	LETTER SIZE	INSCRIPTION
1	1/4"	UTILITY SERVICE MAIN BREAKER	14	1/4"	EXHAUST FAN
2		PANEL H MAIN BREAKER	15		PANELBOARD "A"
3		SPD	16		XFMR "A" BREAKER
4		AUTOMATIC TRANSFER SWITCH	17		PANELBOARD "A" BREAKER
5		PUMP NO.1	18		CONTROL PANEL
6		PUMP NO.2	19		120V/15A UTILITY RECEPTACLE
7		PUMP NO.3	20		PLC/RTU CONTROL PANEL
8		PUMP NO.4	21		ELAPSED TIME METER
9		PUMP NO.5	22		
10		SPACE	23		
11		UNIT HEATER	24		
12			25		
13		EXHAUST FAN	26		

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

ELEVATIONS

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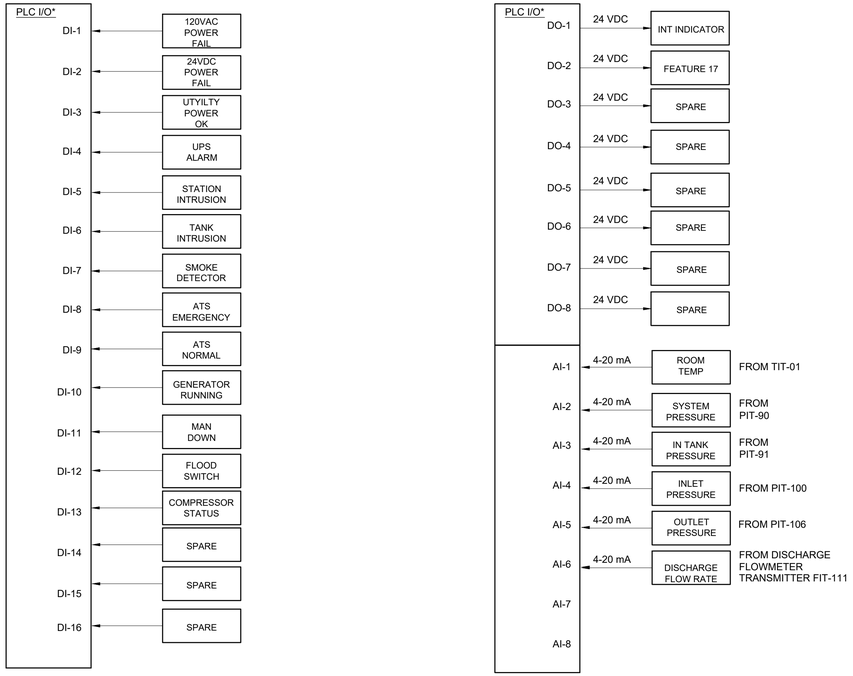
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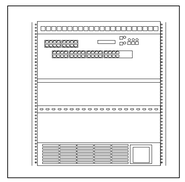
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PLC/RTU CONTROL PANEL I/O BLOCK DIAGRAM

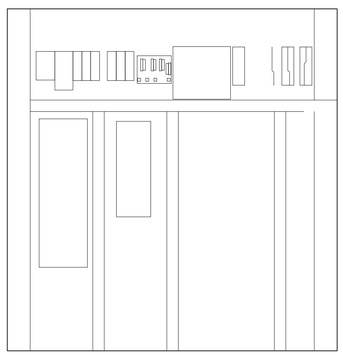
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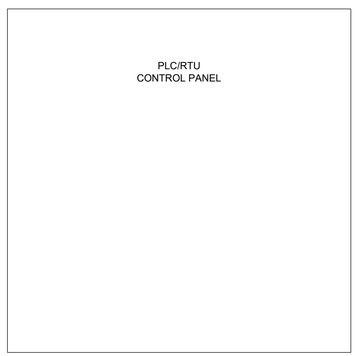
INTERIOR*



EXTERIOR



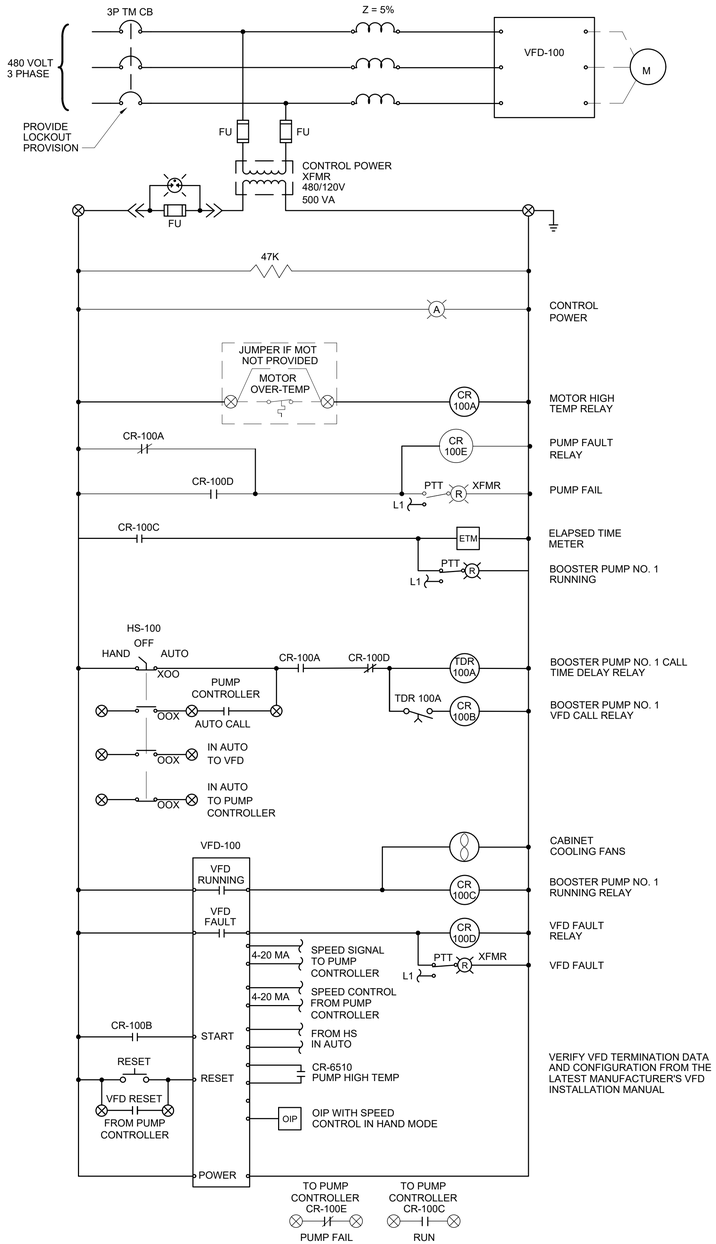
INTERIOR*



EXTERIOR

PLC/RTU CONTROL PANEL ELEVATIONS

NO SCALE *INTERIOR ELEVATIONS FOR INFORMATION ONLY



TYPICAL BOOSTER PUMP MOTOR CONTROLLER WIRING DIAGRAM

(TYP. OF PUMPS 100, 200, 300, 400 & 500)

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

BLOCK DIAGRAMS

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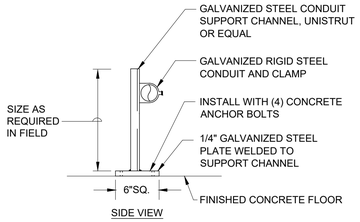
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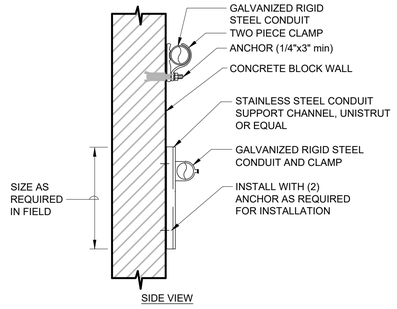
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FLOOR MOUNTED CONDUIT SUPPORT CHANNEL DETAIL

1 / E7

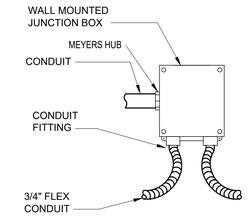
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WALL MOUNTED CONDUIT SUPPORT DETAIL

2 / E7

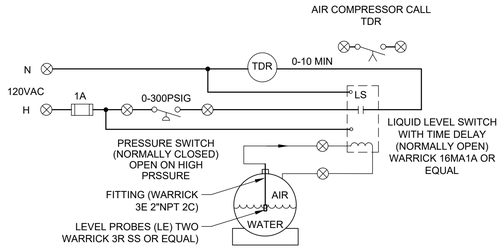
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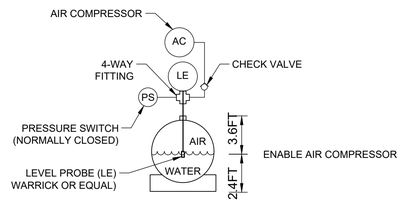
JUNCTION BOX DETAIL

3 / E7

SCALE: NOT TO SCALE



ELECTRICAL CIRCUIT

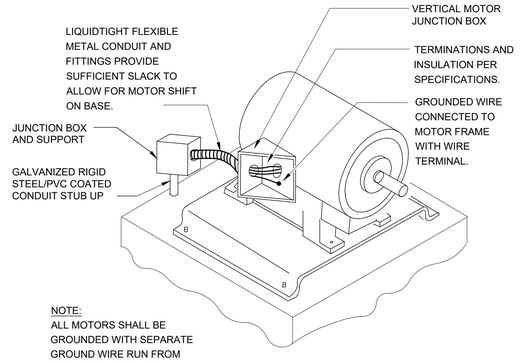


PNEUMATIC CIRCUIT

AIR COMPRESSOR CONTROLS WIRING DIAGRAM

4 / E7

SCALE: NOT TO SCALE



NOTE:
ALL MOTORS SHALL BE GROUNDED WITH SEPARATE GROUND WIRE RUN FROM GROUND BUS IN MCC

TYPICAL MOTOR CONNECTION DETAIL

5 / E7

SCALE: NOT TO SCALE

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SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

ELECTRICAL DETAILS I

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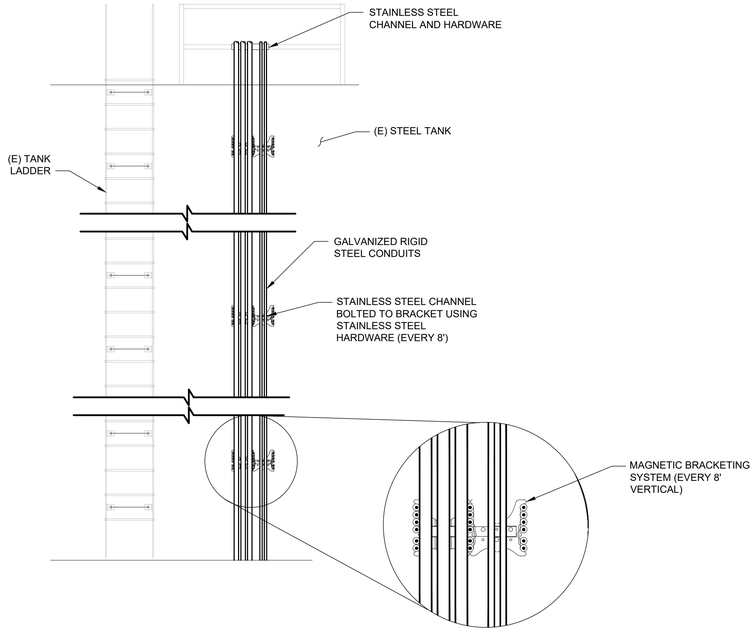
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samterry@earthlink.net

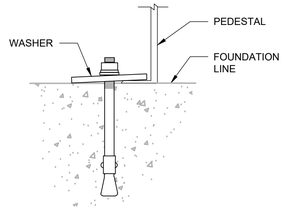
No.14638 Exp.12-31-26 REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA ELECTRICAL

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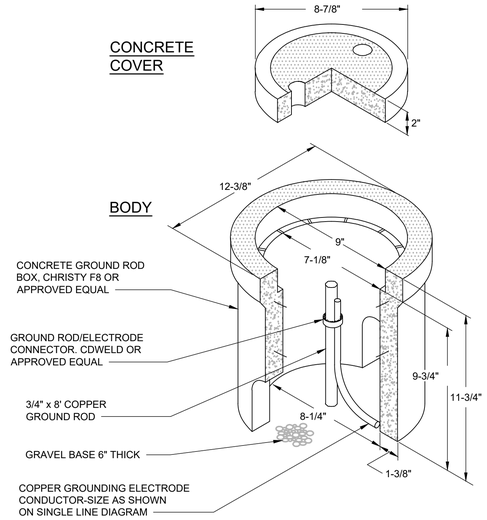
TANK CONDUIT MAGNETIC BRACKET DETAIL 6 E8

SCALE: NOT TO SCALE



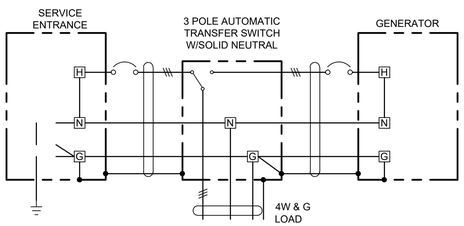
ANCHOR DETAIL 7 E8

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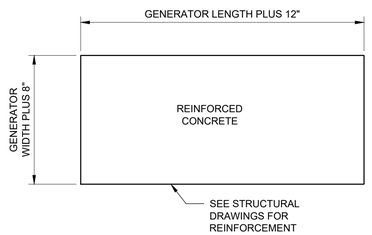
CONCRETE GROUND ROD BOX DETAIL 8 E8

SCALE: NOT TO SCALE



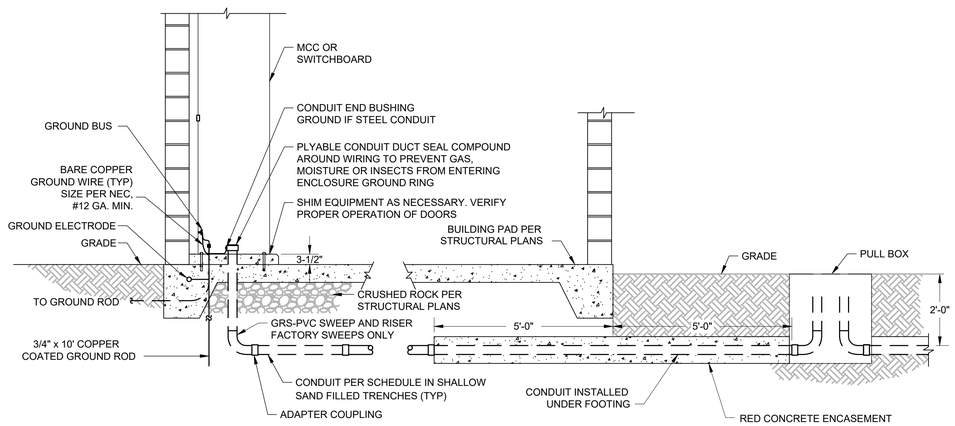
NON-SEPERATELY DERIVED GROUND SYSTEM 9 E8

SCALE: NOT TO SCALE



GENERATOR PAD DETAIL 10 E8

SCALE: NOT TO SCALE



CONDUIT UNDER FOUNDATION 11 E8

SCALE: NOT TO SCALE

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

ELECTRICAL DETAILS II

TRUCKEE DONNER Public Utility District

11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896

NEVADA COUNTY CALIFORNIA

Sauers Engineering, Inc.
Civil & Environmental Engineers
105 Providence Mine Road, Suite 201, Nevada City, CA 95959
Phone: (530) 265-8021 Website: sauerseng.com

BAR IS ONE INCH ON ORIG. DRAWING
IF BAR DOES NOT MEASURE ONE INCH,
ADJUST SCALES ACCORDINGLY

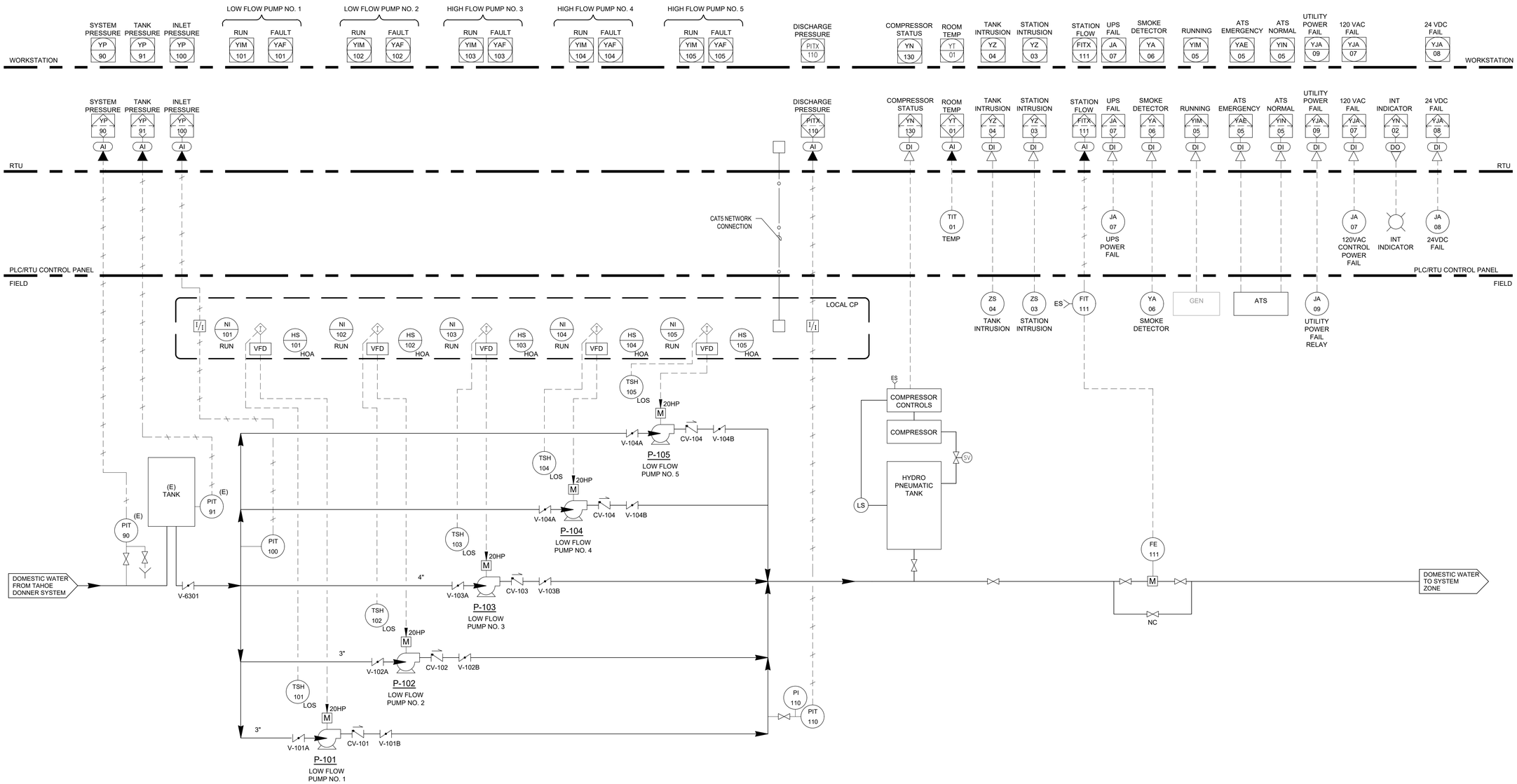
PROJECT NUMBER:	
DESIGN BY:	CCE
DRAFTING BY:	SWT
CHECKED BY:	SWT
FILE PATH:	
DATE:	
SCALES:	
HORIZONTAL	E08
VERTICAL	
SHEET:	23 of 24

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HYDROPNEUMATIC PUMP STATION

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

	LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	LOCATION NORMALLY NOT ACCESSIBLE TO OPERATOR	SECONDARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS	⊖	○	⊖	⊖
COMPUTER FUNCTION	⊖	○	⊖	⊖
PROGRAMMABLE LOGIC CONTROL	◇	◇	◇	◇

I/I - CURRENT TO CURRENT CONVERTOR

REV	DATE	REVISIONS	INITIAL

SITZMARK HYDROPNEUMATIC BOOSTER PUMP STATION REPLACEMENT

PROCESS AND INSTRUMENTATION DIAGRAM

TRUCKEE DONNER Public Utility District
11570 DONNER PASS ROAD
TRUCKEE, CA 96161
PHONE: 530-587-3896
NEVADA COUNTY CALIFORNIA

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DESIGN BY:	CCE
DRAFTING BY:	SWT
CHECKED BY:	SWT
FILE PATH:	
DATE:	
SCALES: HORIZONTAL	E09
VERTICAL	
SHEET:	24 of 24

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REGISTERED PROFESSIONAL ENGINEER DANIEL W. TERRY No.7125 Exp.06-30-2027 CIVIL STATE OF CALIFORNIA

ECS
ECS Engineering, Inc.
916-718-3686
samterry@earthlink.net

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