

SPECIFICATIONS AND CONTRACT DOCUMENTS

**FOR THE
CONSTRUCTION OF THE**

**PACHECO PUMPING PLANT
PRIORITY 1 FIRE ALARM AND SUPPRESSION
SYSTEM IMPROVEMENTS**

Project No. 91214010-9120

Contract No. C0653

JUNE 2020



Santa Clara Valley Water District

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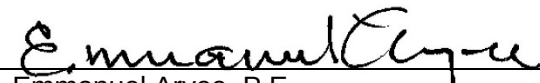
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PRIORITY 1 FIRE PROTECTION IMPROVEMENTS

PROJECT NO. 91214010-9120

CONTRACT NO. C0653

SANTA CLARA VALLEY WATER DISTRICT

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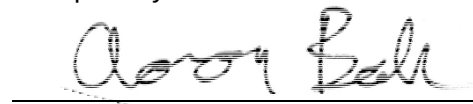

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Richard P. Santos
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Tony Estremera
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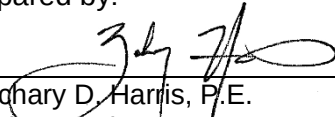


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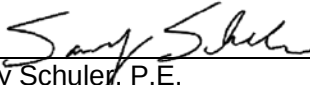


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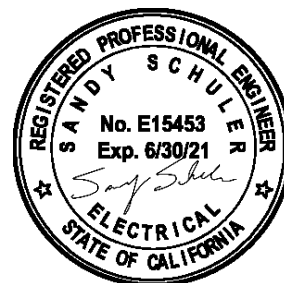


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SECTION 32 – PLUMBING, HVAC AND FIRE SUPPRESSION

- Article 32.01 General Equipment and Mechanical Requirements
- Article 32.05 Heating, Ventilating and Air Conditioning Duct Accessories
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LIST OF APPENDICES

APPENDIX A

- Agreement
- Payment Bond
- Performance Bond
- Escrow Agreement for Security Deposit In lieu of Retention

APPENDIX B

- Notice of Exemption

APPENDIX C

- Guidelines for Contractor's As-Built Mark-Ups of Engineer's Record Drawings

APPENDIX D

- Pacheco Pumping Plant: Best Management Practices and Mitigation Measures
- Merced County Code Chapter 10.60—Noise Control

APPENDIX E

- Plan Set for the Construction of Pacheco Pumping Plant Priority 1 Fire Alarm & Suppression System Improvement Project

STANDARD PROVISIONS

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STANDARD PROVISIONS

SECTION 1. DEFINITIONS

Whenever in these Specifications and other Contract Documents the following abbreviations and terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISI	American Iron and Steel Institute
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWG	American Wire Gage
AWPA	American Wood Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BAAQMD	Bay Area Air Quality Management District
CAEPA	California Environmental Protection Agency
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CWA	Federal Clean Water Act
DHS	California Department of Health Services
HSC	California Health and Safety Code
IEEE	Institute of Electrical and Electronics Engineers
MSDS	Material Safety Data Sheet
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NPDES	National Pollution Discharge Elimination System
RWQCB	California Regional Water Quality Control Board
SAE	Society of Automotive Engineers
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
UBC	Uniform Building Code
UL	Underwriters Laboratories
USEPA	United States Environmental Protection Agency
WCLB	West Coast Lumber Inspection Bureau
WWPA	Western Wood Products Association

DEFINITIONS

Acceptance: The formal, written acceptance of the Contract by the District's Board of Directors, as documented in a recorded Notice of Completion of Contract and Acceptance of Work. Acceptance indicates that all Work has been completed in all respects in accordance with the Drawings and Specifications and with any modifications thereof previously approved.

Activity Hazard Analysis (AHA)/Job Hazard Analysis (JHA): A form used to identify the task and break it down into steps, identify the hazards associated with each step, and identify the control measures used for each step to protect the worker, environment, or public. This form is also commonly referred to as a Job Safety Analysis (JSA).

Addendum: Written or graphic instruments issued prior to the opening of Proposals that make changes, additions, or deletions to the Bid Documents, or Contract Documents.

Agreement: The written document executed by the parties formalizing the Contract.

Approved, Directed, Ordered, or Required: Whenever these words or their derivatives are used, it is the intent, unless otherwise clearly stated, that approval or direction by the Engineer is indicated.

Article: A numbered portion of a title Section of the Specifications.

Bid: The completed Proposal and all associated Bid Forms, including Bidder's Bond or other Bidder's security. Bids not accompanied by the required documents are considered incomplete bids and are nonresponsive.

Bid Documents: All documents to be considered when preparing a Bid. The Notice to Bidders, Instructions to Bidders, Proposal and all accompanying Bid Forms, Bidder's Bond or other Bidder's security, and Contract Documents.

Bidder: Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the Work contemplated, acting directly or through a duly authorized representative.

Board, Board of Directors: The Board of Directors of the District.

Certified Industrial Hygienist: A professional who is certified by the American Board of Industrial Hygienists as trained to evaluate safety and health hazards and to determine safety measures necessary for personnel working under hazardous conditions.

Code: The terms Government Code, Labor Code, etc. refer to codes of the State of California.

Competent Person: A person capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt, corrective measures to eliminate those conditions.

Construction Equipment: Equipment used for the performance of work but not incorporated into the Project.

Contract: The written Agreement between the Contractor and the District comprised of the Contract Documents.

Contract Documents: Refer to Article 2.01. Contract Documents and Precedence.

Contract Time(s): The time (Days) allowed for completion of the entire Work or portion thereof as defined by specified Milestones that meets the requirements of the Contract Documents and is accepted by the Engineer. See also Project Completion and Milestone Completion.

Contract Price(s): The price (dollars) for completion of the entire Work set forth in the Contract Documents.

Contractor: The entity or person with whom the District has executed the Contract and has identified as such therein and referred to throughout the Contract Documents as singular in number and neuter in gender. The term "Contractor" means Contractor or its authorized representative.

Controlling Item of Work: Any feature or combination of features of the Work considered at the time by the Engineer, which if delayed, will delay the completion of Work associated with a specified Contract Time(s).

Days: Calendar days, unless otherwise designated.

Delay: An increase in the duration or length of time for performing the Work that is caused by any event, action, inaction, or factor. The five types of delay are defined in Article 3.08. Change in Contract Time(s).

Definable Feature of Work: A task that is separate and distinct from other tasks and that has separate control requirements.

District: The Santa Clara Valley Water District.

Drawings: The official Drawings, working Drawings, detail Drawings, and supplemental Drawings, or reproductions thereof, that show the location, character, dimension, and details of the Work to be done and that are to be considered as part of the Contract.

Engineer: The designated Engineer as defined in Article 3.02. Engineer of the Standard Provisions who, acting either directly or through a properly designated representative, assumes all duties and responsibilities, and has all rights and authority in accordance with the Contract Documents.

Equipment: Equipment incorporated or to be incorporated into the Project.

First Chargeable Day: The first day of Contract Time allowed for completion of the entire Work. The First Chargeable Day will be specified in the Notice to Proceed.

Fixed Costs: Any necessary labor, Material, and Equipment costs directly expended on the item or items under consideration that remain constant regardless of the quantity of Work done.

Hazardous Material: (A) Any substance, product, waste, or other material of any nature whatsoever that is or that becomes listed, regulated, or addressed pursuant to any Federal, State, or Local Statute, Law, Ordinance, Resolution, Code, Rule, Regulation, Order, or Decree regulating, relating to, or imposing liability (including, but not limited to, response, removal, and Remediation costs) or standards of conduct or performance concerning any hazardous, toxic, explosive, corrosive, flammable, infectious, radioactive, carcinogenic, mutagenic, or as otherwise dangerous waste, substance, or material; (B) any substance, product, waste, or other material of any nature whatsoever whose presence in and of itself may give rise to liability under any of the above Statutes or under any statutory or common law theory based on negligence, trespass, intentional tort, nuisance, strict, or absolute liability or under any reported decisions of a State or Federal court; (C) any substance without limitation that contains petroleum or crude oil, including, but not limited to, petroleum and petroleum products.

Hazardous Waste: Any substance or material as defined in the California Hazardous Waste Control Act Health and Safety Code, Chapter 6.5, Sections 25100 - 25257.1, or in the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq.

Liquidated Damages: The amount stated in the Specifications, as provided for in Government Code Section 53069.85, to be paid to the District or to be deducted from any payments due or to become due the Contractor for each Day of Inexcusable Delay in completing the whole or any specified portion of the Work beyond the specified Contract Time(s) or any other amount specifically stated as a Liquidated Damage in the Contract.

Material: Material incorporated or to be incorporated into the Project.

Milestone: A specified portion of the Work identified in the Contract as a Milestone that is to be completed under the Contract.

Milestone Completion: The date determined by the District when the Milestone is to be complete. Milestone Completion does not constitute acceptance but does establish the completion date of the Milestone for the purpose of assessing Liquidated Damages, if any, associated with the Milestone.

Personnel Protection: Equipment and procedures that minimize human exposure to Regulated Material, Hazardous Material, Hazardous Waste, or unsafe situations.

Plans, Construction Plans: See Drawings.

Project: The erection, construction, alteration, repair, or improvement to be accomplished under the Contract. Refer to Work.

Project Completion: The stage at which the whole Work is complete per the Contract Documents, and the Engineer has performed the final inspection and issued a Project Completion letter.

Proposal: The Proposal states the price for which the Bidder proposes and agrees to perform the Work. See Proposal and Bid Items, Bid Form No. 1.

Qualified Biologist: A biologist who has the experience, education and training necessary to perform specific tasks related to the biological subject discipline, and in an unbiased fashion. The term 'qualified biologist' is used generically to mean a biologist who is trained to perform the given task; specifically, a fisheries biologist, wildlife biologist, or botanist. Training must be in the field to which the task is related. (Refer to the appendices for specific fields of study).

Reasonable Accuracy: Within the tolerances as shown on the Drawings or as indicated in the Specifications.

Regulated Material: Any substance or combination of substances for which Federal, State, or Local regulations require special management, storage, disposal, or handling practices. This includes, but is not limited to, material defined as Hazardous Material and Waste; designated waste (California Water Code Section 13173); and special waste (California Code of Regulations, Title 22, Div. 4.5 [Environmental Health Standards for the Management of Hazardous Waste]).

Remediation: Restoration of contaminated soil, groundwater, or other materials to its pre-contaminated level or to a level acceptable to the District and Local, State, and Federal agencies.

Responsible Bidder: Responsible Bidder as defined in California Public Contract Code Section 1103.

Specifications: The directions, provisions, and requirements contained in the Standard Provisions, Special Provisions, and Technical Provisions.

Subcontractor: An entity or person contracting with the Contractor or with another Subcontractor to perform any portion of the Work. The term "Subcontractor" is referred to throughout the Contract Documents as singular in number and neuter in gender and means a Subcontractor or its authorized representative.

Supplier: An entity or person contracted with the District, the Contractor or its Subcontractors to provide materials and/or equipment for any portion of the Work. The term "Supplier" is referred to throughout the Contract Documents as singular in number and neuter in gender and means a Supplier or its authorized representative.

Total Bid Price: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bid Documents. The Total Bid Price shall include the entire cost of all Work necessary for a complete and fully operational structure or facility in accordance with the requirements of the Contract Documents.

Work: Refer to Article 3.01. Work to be Done, paragraph A. References in the Contract Documents to "Work" may be to specific items of Work.

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SECTION 2. CONTRACT DOCUMENTS

2.01. Contract Documents and Precedence

- A. The Contract Documents comprise the entire Agreement between the District and the Contractor concerning the Work. The Contractor shall properly perform all requirements of the Contract Documents.
- B. The Contract Documents include the District's Contract form and any exhibits attached thereto, including the Notice to Bidders, Instructions to Bidders, Proposal Form, Proposal, Standard Provisions, Special Provisions, Technical Provisions, Drawings, Specifications, Addenda, Appendices, approved Change Orders, and Directed Change Orders (DCO) as defined in Section 3, if any.
- C. The Contract Documents are intended to be complementary and include all items necessary for the Contractor's proper execution and completion of the Work. Anything mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be as if shown or mentioned in both. Any part of the Work not shown or mentioned in the Drawings or in the Specifications that is inferable or implied by either, or that is necessary or usual for proper performance of the Work, shall be provided by the Contractor at its own expense.
- D. In case of conflicts, errors, and discrepancies in any of the Contract Documents, the order of precedence (from highest to lowest priority) is as follows. Within the same order of precedence, specific requirements shall take precedence over general requirements:
 - 1. Change Orders (CO) or DCO
 - 2. Agreement
 - 3. Addenda
 - 4. Special Provisions
 - 5. Technical Provisions
 - 6. Drawings/Plans
 - 7. Standard Provisions
 - 8. State Specifications and Plans
 - 9. Appendices
- E. With reference to the Drawings:
 - 1. Figures or numerical dimensions govern over scaled dimensions.
 - 2. Detail Drawings govern over general Drawings.

3. Addenda/CO or DCO Drawings govern over Contract Drawings.
4. Contract Drawings govern over standard Drawings.
5. Notes apply only to the Drawings where the notes appear, unless classified as "typical," "general," or "universally applicable," in which case they apply to all Drawings where the conditions or circumstances noted occur.
6. Typical details apply to all Drawings, unless a specific, different detail is shown.

2.02. State Specifications and Plans

- A. Unless otherwise stated, State Specifications and Plans referred to in these Specifications shall be the latest published edition of the State of California Department of Transportation Standard Specifications and Standard Plans and updates thereto and are by reference made a part of these Specifications the same as though set out in full, as to the provisions requiring compliance.
- B. When specifically stated to follow the State Specifications and Plans for an item, the Work set forth in these Contract Documents shall be accomplished in accordance with the appropriate provisions and details of the State Standard Specifications and Standard Plans.

2.03. Clarification of Contract

- A. The following interpretative rules apply throughout the Contract Documents:
 1. The provisions of the Contract Documents are complementary and should be interpreted to view the Contract Documents as a whole.
 2. A concept phrased in the singular should be interpreted in the plural as required.
 3. Masculine includes feminine and feminine includes masculine.
 4. The words "shall," "will," and "must" in any of their tenses indicate mandatory requirements. The word "may" indicates "may apply" or "may not apply."
 5. The use of examples (e.g., "such as" or "including") does not limit or exclude examples not specifically mentioned.
 6. The words "provide," "furnish," "perform," "construct," and "install" mean that the Contractor shall provide, perform, construct, and install and shall include all services necessary to provide, perform, construct, and install unless preceded by the word "only."

- B. The Contract Documents are not complete in every detail but show the purpose and intent only. The Contractor shall comply with their true intent and meaning, taken as a whole, and shall not avail itself of any manifest error, omission, discrepancy, or ambiguity that appears in the Contract Documents, instructions, or work performed by others.
- C. All corrections of readily apparent errors or omissions in the Contract may be made by the Engineer when such corrections are necessary for the proper fulfillment of their intention as construed by the Engineer. The misplacement, addition, or omission of any word, letter, figure, or punctuation mark that has no substantive legal effect will in no way change the due spirit, intent, or meaning of these Specifications.
- D. Any part of the Work not shown on the Drawings or described in these Specifications, but that is reasonably or ordinarily implied by either, shall be furnished and installed by the Contractor as if fully described in these Specifications and shown upon the Drawings.
- E. **Contract Document Clarifications (CDC):** A document initiated by the District consisting of supplementary details, instructions, or information issued by the District that clarifies or supplements the Contract Documents. Contract Document Clarifications do not constitute a change in Contract Work, Contract Price(s), or an extension in Contract Time(s) unless requested by the Contractor and approved by the District in accordance with the Contract Documents.
- F. Payment for items of Work that are called for in the Specifications or that are shown on the Drawings but that are not separately identified in the Proposal Form, shall be compensated as part of the Bid price of one or more of the items that are listed; no additional payment shall be made.

2.04. Requests for Information

- A. **Request for Information (RFI):** A document prepared by the Contractor requesting information from the District regarding the Project or Contract Documents.
- B. Contractor shall be responsible for its costs and the costs of its Subcontractors to review Contract Documents and field conditions and to implement and administer an RFI system throughout the Contract Time(s) in accordance with the requirements of the Contract. The Contractor shall be responsible for costs incurred by the District for the work of the District's consultants and District administrative efforts in answering Contractor RFIs where the answer could reasonably be found by reviewing the Contract Documents.
- C. The Contractor shall carefully review the appropriate portions of the Contract Documents a minimum of 30 Days in advance of the Work to be executed for the express purposes of checking for manifest errors, omissions, discrepancies, or ambiguities. The Contractor shall not be entitled to any compensation for

Delays, disruptions, inefficiencies, or additional administrative effort caused by the Contractor's untimely review of the Contract Documents.

- D. Should it appear that the Work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Specifications or on the Drawings, or if the Contractor discovers any discrepancies between the Contract Drawings and conditions in the field, or any errors or omissions in the Contract, or in the layout given by stakes, points, or instructions, the Contractor shall submit a written RFI to the Engineer. If the Contractor proceeds with any such Work without receiving such clarification or RFI reply, it shall be responsible for correcting all resulting damage and any nonconforming Work.
- E. The Engineer will issue written clarification or interpretation of Contract Document requirements in response to the Contractor's requests and other sources of information. The Engineer's decision thereon shall be final; the Contractor shall conform to it as part of the Contract.

2.05. Examination of Drawings, Specifications, and Site of Work

- A. As noted in the Notice to Bidders, the Contractor's submission of a Proposal is conclusive evidence that the Contractor investigated and is fully aware of the conditions and difficulties to be encountered of the character, quality, and quantities of work to be performed, the Material to be furnished, and the requirements of the Proposal, Drawings, Specifications, and other Contract Documents.
- B. Where investigation of subsurface conditions has been made by the District in respect to foundation, characterization of soils, groundwater, or other design, Bidders may inspect the records of the District as to such investigation, including examination of samples and drill cores, if any. When logs of test boring showing a record of the data obtained by the District's investigation of subsurface conditions are made available, these logs represent only the opinion of the District as to the character of material encountered by it in its test borings and are made available only for the convenience of Bidders.
- C. Note that the District's investigation of subsurface conditions is made for the purpose of design. The District assumes no responsibility whatsoever in respect to the sufficiency of test borings, or to accuracy of the log of test borings, or to other preliminary investigations, or of the interpretation thereof. There is no guarantee, expressed or implied, that the conditions indicated are representative of those existing throughout the Work, or to any part of it, or that unforeseen developments may not occur.
- D. Making such information available to the Contractor is not to be construed in any way as a waiver of the provisions of this Article; Bidders must satisfy themselves through their own investigations, analyses, and interpretations as to conditions to be encountered.

- E. No information derived from such inspection of records or from preliminary investigations made by the District, or from the Engineer, or from assistants, or from the maps, Specifications, profiles, or Drawings will in any way relieve the Contractor from any risk or from properly fulfilling all the terms of the Contract.

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SECTION 3. SCOPE OF WORK

3.01. Work to be Done

- A. The performance by the Contractor of all of its responsibilities and obligations set forth in the Contract Documents. Work includes, but is not limited to, providing labor, Materials, Equipment, testing, services, and documentation required by the Contract Documents. References in the Contract Documents to "Work" may be to specific items of Work. All Work performed is to be in compliance with the Contract Documents.
- B. During construction, the Contractor shall keep the worksite, areas adjacent to the worksite or otherwise impacted by the Contractor's operations and access roads in an orderly condition, free and clear of debris and discarded materials.

3.02. Engineer

- A. The Engineer of the District shall be the District's representative who assumes all duties and responsibility and has all rights and authority as assigned in the Contract Documents.
- B. The Engineer of the District is the Deputy Operating Officer or Assistant Operating Officer of the Water Utility Capital or Watershed Capital or Water Utility Technical Support Division or Office of Watersheds as applicable. Administrative hearings, if required, will be conducted by an Operating Officer of a different Division or Office.
- C. Authority of Engineer: The Engineer shall decide all questions that may arise as to the quality or acceptability of Material furnished, Work performed, and rate of progress of the Work; all questions that may arise as to the interpretation of the Drawings and Specifications; and all questions as to the acceptable fulfillment of the Contract on the part of the Contractor. The Engineer's decisions shall be final. The Engineer has the authority to enforce these decisions and provide direction to the Contractor, which the Contractor shall carry out promptly.

3.03. Contractor Staffing

- A. A project manager and superintendent shall be provided as specified below:
 - 1. The Contractor shall submit for approval in writing before starting the Work the name of the project manager and superintendent who shall have complete authority to represent and act for the Contractor. This submittal shall also include a list of reference projects with the following information: (i) the individual's name; (ii) the project name that serves as the basis of qualification; (iii) the project site location; (iv) a brief project description; and (v) the name and mailing address of the project owner.
 - 2. The project manager shall have at a minimum seven (7) years' experience as a contractor's project manager on public works with not less than four (4) years' experience as a project manager on projects with

- complexity and configuration similar to the Work described in the Contract Documents.
3. The superintendent shall have at a minimum seven (7) years' experience as a contractor's general superintendent on public works with not less than four (4) years' experience as a superintendent on projects with complexity and configuration similar to the Work described in the Contract Documents.
 4. The superintendent of the Contractor shall normally be present at the site of the Work at all times while Work is actually in progress on the Contract. During any period when Work is suspended, arrangements acceptable to the Engineer shall be made for any emergency Work that may be required to be done by the Contractor.
 5. Whenever the Contractor or an authorized representative is not present on any part of the Work where it may be desired to give direction, orders will be given by the Engineer, which shall be received and obeyed by the superintendent who may have charge of the particular Work in reference to which the orders are given. Any order given by the Engineer not otherwise required by the Specifications to be in writing will, on the request of the Contractor, be given or be confirmed by the Engineer in writing.
 6. If the project manager or superintendent is not deemed qualified or if the project manager's or superintendent's performance on the Work is determined to be unsatisfactory by the Engineer, the project manager or superintendent shall be immediately removed from the Project. The Contractor shall submit for approval the same information described in this article for a proposed substitute project manager or superintendent.
 7. The Contractor shall designate, in writing, the names and telephone numbers of at least three (3) representatives who can be contacted at any time in the event that an emergency occurs.
- B. A Professional Scheduler shall be provided unless removed in the Special Provisions. The Professional Scheduler shall meet the requirements specified in Article 5.04. Professional Scheduler. If Professional Scheduler is not required, the Contractor is responsible for providing adequate resources required to develop and to maintain schedules.
- C. A Site Safety and Health Supervisor shall be provided unless removed in the Special Provisions. The Site Safety and Health Supervisor shall meet the requirements specified in Article 8.11. Site Safety and Health Supervisor.
- D. A Field Quality Control Manager shall be provided if required in the Special Provisions. The Field Quality Control Manager shall meet the requirements specified in the Special Provisions Article 20.04.02. Contractor's Quality Staffing Requirements.

3.04. Character of Workers

- A. Any Subcontractor or person employed by the Contractor or Subcontractor who fails or refuses to carry out the directions of the Engineer, or who appears to the Engineer to be incompetent, or who acts in a disorderly or improper manner shall be removed from the Work immediately on the written request of the Engineer; such person shall not again be employed on the Work.

3.05. Layout of Work and Surveys**3.05.01 Responsibility of District**

- A. The District shall establish survey control points and reference points as shown on the Drawings for required field layout by the Contractor.
- B. The District shall provide only the minimum survey crew services essential for orderly performance of the Work; District survey crews will not be available at all times for the Work under these Specifications.
- C. The District shall provide to the Contractor the station(s) and offset distance(s) to all reference points and benchmarks that were provided by the District in paragraph A.
- D. The District shall establish required stakes only once. Survey stakes destroyed or removed will be replaced by the District at the Contractor's expense.

3.05.02. Responsibility of Contractor

- A. When the Contractor requires stakes or marks as provided for in paragraph A, it shall clear and grub the area to be staked and then notify the Engineer of such requirements in a reasonable length of time in advance of starting operations that require such stakes or marks. In no event shall a notice of less than seven (7) Days be considered a reasonable length of time.
- B. Where construction operations require removal of the District's stakes or other survey marks, the Contractor shall reference such points in an approved manner. Survey stakes or marks established by the District shall be preserved by the Contractor until their removal is authorized. In case of their unauthorized destruction or removal by the Contractor's forces, they will be replaced at the Contractor's expense. Any cost to the District of replacing survey stakes or marks will be deducted from payments due the Contractor. Such cost will include a reasonable charge for use of District supplies, labor, and Equipment, plus overhead.
- C. The Contractor is solely responsible for the measurements and layout of the Project from the given survey control points and reference points provided by the District. Any questions with regard to interpretation of Project layout shall be resolved by the Engineer.

- D. The Contractor shall not remove or disturb survey monuments and permanent markers unless otherwise approved by the Engineer and not until the District has recorded and referenced the locations. The Contractor shall be charged at a reasonable rate for the restoration or replacement of survey monuments and permanent markers by the District.
- E. No survey monuments, permanent markers for the District right of way, or District survey control points shall be removed or disturbed until the Engineer has recorded the locations thereof and a permit for such removal has been received from the agency having jurisdiction. When the construction Work has been completed, the Contractor shall replace said monuments accurately in the locations as referenced by the Engineer at no cost to the District.
- F. If any marker or monument is destroyed by the Contractor without prior written approval of the Engineer, the Contractor shall be responsible for the accurate replacement of that marker or monument at no expense to the District by a Land Surveyor licensed by the State of California in accordance with the California Business and Professions Code Chapter 15, Land Surveyors, Section 8771.

3.06. Changes in the Work

- A. **Change Order:** A written document that changes the Contract and has been fully executed bilaterally by the District and Contractor that authorizes an addition, deletion, or revision in the Work; an adjustment in the Contract Price(s); and/or the Contract Time(s), including Milestone Completion dates or durations.
- B. **Directed Change Order (DCO):** The District's written order that is a Change Order unilaterally executed by the District to order additions, deletions, or revisions in the Contract Work. If deemed necessary and/or appropriate by the Engineer, the DCO will include an adjustment in the Contract Price(s) and/or in the Contract Time(s) and/or in other terms and conditions that the District, at its sole discretion, deems reasonable for the change.
- C. **Potential Change Order (PCO):** The District's written request to the Contractor for a proposal to perform PCO Work prior to the District's issuance of a Change Order or DCO. A PCO may also be created by the District to track disputed Work.

3.06.01. Potential Change Orders and Change Orders

- A. The District may at any time, or from time to time and without notice to the Contractor's surety, order additions, deletions, or revisions to the Work and/or to the Contract Time(s) and may request a proposal from the Contractor for a PCO for such additions, deletions, or revisions in the Work and/or in the Contract Time(s). Pursuant to Articles 3.07. Change in Contract Price(s) and 3.08. Change in Contract Time(s), the Contractor shall submit any requests the Contractor has for adjustments in the Contract Price(s) and/or in the Contract Time(s).

- B. Notwithstanding the time limits stated in Article 3.06.01. Potential Change Orders and Change Orders, upon receipt of such request, the Contractor shall furnish a detailed estimate of increase or decrease in costs and/or in time, together with cost and schedule breakdowns and other supporting data within the time specified in the request, but no later than 30 Days after receipt of such a request unless the Engineer allows additional response time. The Engineer shall review and respond in writing to the Contractor's estimate prior to proceeding with the Work.
- C. Changes in the Contract Price(s) shall be determined and paid in accordance with Article 3.07. Change in Contract Price(s). Changes in the Contract Time(s) shall be determined and adjusted in accordance with Article 3.08. Change in Contract Time(s).
- D. The District and the Contractor shall execute appropriate Change Orders covering:
 - 1. changes in the Work that are ordered by the District pursuant to paragraph "A" above;
 - 2. changes in the Contract Price(s) and/or Contract Time(s) that are agreed to by the parties; or
 - 3. any other changes agreed to by the parties.
- E. The Contractor shall not be entitled to an increase in the Contract Price(s) nor to an extension of the Contract Time(s) with respect to any Work performed that is not required by the Contract, except in the case of an emergency or in the case of uncovering Work as provided in Article 9.06.01. Inspection, paragraph H.

3.06.02. Change Order Request

- A. Should the District's Contract Document Clarifications (CDC) or other written directive, in the opinion of Contractor, materially exceed or change the requirements of the Contract Documents, the Contractor shall submit to the District a written Change Order Request (COR) within seven (7) Days of receipt of the CDCs or of other written directive.
- B. A COR shall reference the CDC or other written directive and the relevant Specifications and Drawings.
- C. A COR shall also include a cost proposal and/or time adjustment proposal as a good faith estimate of any additional compensation or time associated with the affected Work.
- D. Failure to submit a timely, documented COR shall constitute a waiver of any future claim for additional compensation or time relating to such Work.

3.06.03. Directed Change Orders

- A. In situations where (i) the Contractor fails to submit a proposal for a PCO within the time specified; or (ii) when the District and the Contractor cannot agree on the terms and conditions of a PCO within a reasonable amount of time as determined by District; or (iii) if, in the judgment of the Engineer, it is impracticable because of the nature of the change or for any other reason for the parties to determine and agree on the costs and schedule impacts before the change must be performed, the District has the right to issue to the Contractor a DCO signed by the District only, with compensation based on the Engineer's estimate of cost, time, and other impacts associated with performance of changes in the Work.
- B. A DCO may be issued by the District as a result of, but not limited to, any of the following conditions:
 - 1. Responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in Article 3.09. Differing Conditions.
 - 2. Responding to any damage to improvements of property or to an emergency affecting the safety of life or property as provided in Article 4.10. Preservation of Property.
 - 3. Utility relocation as provided in Article 4.25. Coordination With Utilities.
 - 4. Emergency work as provided in Article 4.10. Preservation of Property and in the Special Provisions.
 - 5. Protested Work under Article 3.11.01. Protest.
 - 6. PCO work.
- C. Upon receipt of a DCO, the Contractor shall immediately act upon the Work ordered by the District, all in accordance with the applicable terms and conditions of the Contract Documents.
- D. The District's issuance of a DCO is for the purpose of unilaterally modifying the Contract Work, and/or Contract Price(s), and/or Contract Time(s), as deemed necessary by the Engineer. The parties may subsequently negotiate mutually acceptable terms and conditions of a Change Order to replace the DCO, as provided in this Article.
- E. The Contractor may, at any time after the District's issuance of a DCO, furnish a detailed estimate of increases or decreases in costs and/or time, cost and schedule breakdowns, and references to relevant Contract Specifications in support of its position with regard to the unilateral directive.

- F. Should the Contractor disagree with the terms of the DCO, the Contractor may protest in accordance with Article 3.11.01. Protest. This action shall not delay the requirement to immediately act upon the Work as provided herein.

3.06.04. Allowable Quantity Variations

- A. General: Increases or decreases in the quantity of a Contract item of Work shall be determined by comparing the actual pay quantity of an item of Work with the approximate quantity in the listing of the Bid items contained in the Proposal.
1. If the actual pay quantity of an item of Work varies from the approximate quantity by 25 percent or less, payment shall be made for the actual quantity of Work performed at the Contract unit price listed in the Proposal.
 2. If the actual pay quantity of an item of Work varies from the approximate quantity by more than 25 percent, in the absence of an executed Contract Change Order or DCO specifying the compensation to be paid, the compensation payable to the Contractor shall be determined in accordance with this Article.
 - a. Increases of More Than 25 Percent: If the actual pay quantity of an item of Work exceeds the approximate quantity by more than 25 percent, the amount of Work in excess of 125 percent of the approximate quantity may be paid for by adjusting the Contract unit price, subject to the following conditions: (i) the Contractor can demonstrate to the satisfaction of the Engineer that an adjustment in the Contract unit price is warranted; and (ii) the adjusted unit prices are reasonable and approved by the Engineer. Such adjustment of the Contract unit price shall be the positive or negative difference between the Contract unit price and the actual unit cost of the total pay quantity of the item. At the sole option of the Engineer, the actual unit cost of the Work involved in such excess shall be determined in accordance with Article 3.07.01.G.2. (by mutual acceptance of a lump sum) or with Article 3.07.02. Cost of Extra Work (based on Time and Materials); such unit costs shall include an appropriate portion of the Contractor's allowable overhead and profit.
 - (1) If the cost of an item of Work includes Fixed Costs, the Fixed Costs shall be deemed to have been recovered by the Contractor by the payments made for 125 percent of the approximate quantity at the Contract unit price for the item; in computing the actual unit cost, the Fixed Costs shall be excluded.
 - (2) When the compensation payable for the quantity of Work performed in excess of 125 percent of the approximate quantity is less than \$5,000 at the Contract unit price, no adjustment in the Contract unit price shall be made unless

requested in writing by the Contractor within 14 Days from the date the Contractor became aware, or should have reasonably become aware, of the increase in quantity.

- b. Decreases of More Than 25 Percent: If the actual pay quantity of an item of Work is less than 75 percent of the approximate quantity, an adjustment in unit price shall not be made unless the Contractor makes a request in writing within 14 Days from the date the Contractor became aware, or should have reasonably become aware, of the decrease in quantity. If the Contractor makes a request, the actual pay quantity of this item of Work performed may be paid for by adjusting the Contract unit price, subject to the following conditions: (i) the Contractor can demonstrate to the satisfaction of the Engineer that an adjustment in Contract unit price is warranted; and (ii) the adjusted unit prices are reasonable and approved by the Engineer. Such adjustment of the Contract unit price shall be the positive or negative difference between the Contract unit price and the actual unit cost of the total pay quantity of the item, including Fixed Costs. At the sole option of the Engineer, payment for the actual quantity of Work shall be made by mutual acceptance of a lump sum amount or cost of Work based on Time and Materials; such unit costs shall include an appropriate portion of the Contractor's allowable overhead and profit.

- (1) Payment for the actual pay quantity of such item of Work shall in no case exceed the payment that would have been made for the performance of 75 percent of the approximate quantity of such item at the Contract unit price.

- B. Eliminated Items: If any Contract item of the Work is eliminated in its entirety, the Contract Sum shall be reduced by the amount bid for that Bid item, including overhead and profit. Payment shall be made to the Contractor for the actual cost incurred in connection with the eliminated Contract item if incurred prior to the date of notification in writing by the Engineer of such elimination.

- 1. If acceptable Material is ordered by the Contractor for an eliminated Contract item prior to the date of notification of the elimination by the Engineer, and if orders for the Material cannot be canceled, payment for the Material shall be made at the actual cost to the Contractor. In this case, the Material shall become the property of the District. If the Material can be returned to the vendor and if the Engineer so directs, the Material shall be returned, and the Contractor shall be paid for the actual cost for returning the Material.
 - 2. The actual costs to be paid by the District to the Contractor in accordance with this Article will be computed in accordance with Article 3.07.02. Cost of Extra Work, which shall include an allowance for overhead and profit.
 - 3. In the event the Contractor and the District are unable to agree on the credit amount due, the District shall unilaterally determine the amount.

- C. Supplemental Contract Items: Items noted as "Supplemental" in the Proposal may be deleted entirely or in part at the sole discretion of the District. The provisions of Articles associated with Allowable Quantity Variations or Eliminated Items shall not apply to Supplemental Contract Items.

3.07. Change in Contract Price(s)**3.07.01. General**

- A. The Contract Price(s) constitutes the total compensation payable to the Contractor for performing the Work. All duties, responsibilities, and obligations assigned to or undertaken by the Contractor to perform the Work shall be at the Contractor's expense without a change in the Contract Price(s).
- B. The Contract Price(s) shall only be changed by a fully executed Change Order or by a DCO. Any requests by the Contractor for an increase or decrease in the Contract Price(s) shall be based on a written Change Order Request (COR) delivered promptly by the Contractor to the Engineer by no later than seven (7) Days after the date of the occurrence of the event giving rise to the request and stating the general nature of the request, unless the time is modified in the Special Provisions.
- C. The COR by the Contractor shall be substantiated within 30 Days after submittal of the written notice with a cost proposal quantifying the costs and schedule impacts associated with the request with supporting data, unless the Engineer allows an additional period of time for the Contractor to ascertain more accurate data in support of the request, or unless the time is modified in the Special Provisions.
- D. No request by the Contractor for an adjustment in the Contract Price(s) shall be valid if not submitted timely in accordance with this Article; failure to submit a timely and fully documented request shall constitute a waiver of any future requests or Claims for additional compensation or a time extension related to such Work.
- E. Any request for an adjustment in the Contract Price(s) and/or in the Contract Time(s) shall include, but shall not be limited to:
 - 1. a written description of the event or issue or combination of events/issues that gave rise to the request, including and without limitation, the start date of the event or events and the anticipated or actual finish date;
 - 2. a written description of the legal basis of the request with specific references to the Contract provisions upon which the Contractor relies;
 - 3. an identification of the Work (e.g., activities with the current updated Detailed Progress Schedule and similar information) affected by the event(s);

4. relevant correspondence and other information related to and supporting entitlement;
 5. written documentation pursuant to Article 3.07.02. Cost of Extra Work through 3.07.05. Compensation for Time Extension related to pricing of the requested change;
 6. a written description of the effect of the request on the progress of the Work;
 7. a detailed schedule analysis based on the most current Detailed Progress Schedule that identifies the critical and/or controlling portions of the Work impacted by the change and the anticipated dates of the impact;
 8. the specific number of Days of time extension requested for any impacted Contract Time(s);
 9. a written proposal for any additional compensation being requested that would fully compensate the Contractor for all costs of acceleration of the related Work needed to overcome the associated Delay, if any; and
 10. a written statement from the Contractor that the proposed adjustment is the entire adjustment of the Contract Price(s) and/or of the Contract Time(s).
- F. The Engineer shall review the Contractor's COR within 14 Days after receipt of the cost proposal and supporting documents, and render its determination in writing, unless the time is modified in the Special Provisions, Work, and Contract Time. If the Engineer requires a longer period for its determination, it will provide written notice to the Contractor within the initial 14-Day period. If the Engineer does not issue a determination within the initial or extended period, the request shall be deemed rejected and the provisions of Article 3.11. Disputes shall apply.
- G. The value of any Work covered by a PCO, Change Order, DCO, or any request for an increase or decrease in the Contract Price(s) shall be determined in one of the following ways:
1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved; or
 2. By mutual acceptance of a lump sum, which shall follow the basic pricing rules set forth under Article 3.07.02. Cost of Extra Work and include an allowance for overhead and profit in accordance with Article 3.07.02.G. Contractor's Fee; unless otherwise approved by the Engineer; or
 3. On the basis of the cost of Work (determined as provided in Articles 3.07.02. Cost of Extra Work and in 3.07.04. Special Services) plus a Contractor's fee for overhead and profit (determined as provided in

Article 3.07.02. Cost of Extra Work). For this payment basis, the Engineer will direct the Contractor to proceed on a Time-and-Materials basis and may also establish a Not-to-Exceed (NTE) budget for the change.

3.07.02. Cost of Extra Work

- A. The term “cost of extra Work” means the sum of all direct costs necessarily incurred and paid by the Contractor or estimated to be incurred and paid by the Contractor for labor, Materials, and Equipment in the proper performance of Work, plus a markup for overhead and profit as defined in this Article. Except as otherwise may be agreed to in writing by the District, such costs shall be in amounts no higher than those prevailing in the locality of the Project.
- B. Labor: The direct cost of labor used in performing Work by the Contractor, a Subcontractor, or by other forces will be the sum of the following:
 - 1. The actual or estimated wages paid plus any employer payments to or on behalf of workers for fringe benefits, including health and welfare, pension, vacation, and similar purposes.
 - 2. There shall be added to the actual or estimated wages as defined above a percentage set forth in the latest “Labor Surcharge and Equipment Rental Rates” in use by the California State Department of Transportation, which is in effect on the date upon which the Work is accomplished. This percentage shall constitute full compensation for all payments imposed by State and Federal laws, including, but not limited to, workers’ compensation insurance and Social Security payments.
 - 3. The amount paid or estimated to be paid for subsistence and travel required by collective bargaining agreements.
 - 4. For Equipment operators, payment for the actual or estimated cost of labor and subsistence or travel allowance shall be made at the rates paid, or estimated to be paid, by the Contractor to other workers operating similar Equipment already on the Work, or in the absence of such labor, established by collective bargaining agreements for the type of workers and location of the extra Work, whether or not the operator is actually covered by such an agreement. A labor surcharge shall be added to the cost of labor described herein in accordance with the provisions in this Article, which surcharge shall constitute full compensation for payments imposed by State and Federal laws, and all other payments made to on behalf of workers other than actual or estimated wages.
- C. Materials: The direct cost of Materials used or to be used in performing Work shall be the actual or estimated cost to the purchaser, including sales tax, whether the Contractor or a Subcontractor, from the Supplier thereof, except as the following are applicable:

1. Trade discounts available to the purchaser shall be credited to the District notwithstanding that such discounts may not have been taken by the Contractor.
 2. For Materials secured other than by a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid, or estimated to be paid, to the actual Supplier as determined by the Engineer. Markup, except for actual or estimated costs incurred in the handling of such Materials, shall not be allowed.
 3. Payment for Materials from sources owned wholly or in part by the purchaser shall not exceed the price paid, or estimated to be paid, by the purchaser for similar Materials from said sources on extra Work items or the current wholesale price for such Materials delivered to the worksite, whichever price is lower.
 4. The Contractor is responsible for and shall not be compensated for any increases in Material costs beyond those included in its Contract Price(s), including, but not limited to, sudden market changes or unexpected Material price increases.
 5. If, in the opinion of the Engineer, the estimated or actual cost of Materials is excessive or the Contractor does not furnish satisfactory evidence of the cost of such Material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the worksite, less any trade discount. The District reserves the right to furnish Material for the extra Work; no Claim shall be made by the Contractor for costs and profit on such Material.
- D. Equipment: The Contractor shall be paid for the use of Equipment at the rental rate listed for such Equipment specified in the current edition of the Department of Transportation publication entitled, *Labor Surcharge and Equipment Rental Rates*, which is in effect on the date upon which the Work is accomplished. Such rental rates shall be used to compute payments for Equipment whether the Equipment is under the Contractor's control through direct ownership, leasing, renting, or under another method of acquisition. The rental rate to be applied for use of each item of Equipment shall be the rate resulting in the least total cost to the District for the total period of use. If it is deemed necessary by the Contractor to use Equipment not listed in the foregoing publication, an equitable rental rate for the Equipment will be established by the Engineer. The Contractor shall furnish cost data, which might assist the Engineer in establishing the rental rate.
1. The rental rates paid, or estimated to be paid, as above provided shall include the cost of fuel, oil, lubrication supplies, small tools, necessary attachments, repairs, and maintenance of all kinds; depreciation, storage, insurance, and all incidentals, unless the Equipment is idle due to a Delay. Operators of Equipment will be separately paid for as provided in paragraph 4 of Article 3.07.02.B. Labor.

2. All Equipment shall be in good working condition and suitable for the purpose for which the Equipment is to be used.
 3. Before construction Equipment is used on the extra Work, the Contractor shall plainly stencil or stamp an identifying number thereon at a conspicuous location and shall furnish to the Engineer, in duplicate, a description of the Equipment and its identifying number.
 4. Unless otherwise specified, manufacturer ratings and manufacturer-approved modifications shall be used to classify Equipment to determine applicable rental rates. Equipment that has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.
 5. Individual pieces of Equipment or tools having a replacement value of \$500 or less, whether or not consumed by use, shall be considered to be small tools; no payment shall be made.
 6. Compensation for idle time of Equipment shall include the ownership costs only, not including operating costs, in accordance with the following:
 - a. The Equipment rental rate shall be based on the delay factor in the edition of the Department of Transportation's publication entitled, *Labor Surcharge and Equipment Rental Rates*, in effect on the date the Work is accomplished.
 - b. Daily number of payable hours equals the normal working hours during the delay, not to exceed eight (8) hours per Day or 40 hours per week.
 - c. Delay Days exclude nonworking Days.
 - d. Markups are not added.
- E. Owner-Operated Equipment: When owner-operated Equipment is used, or anticipated to be used, to perform Work and is to be paid for as extra Work, the Contractor shall be paid for the Equipment and for the operator as follows:
1. Payment for the Equipment shall be made in accordance with the provisions in Contractor's Article 3.07.02.D. Equipment.
 2. Payment for the cost of labor and subsistence or travel allowance shall be made at the rates paid, or estimated to be paid, by the Contractor to other workers operating similar Equipment already on the Project, or, in the absence of such other workers, at the rates for such labor established by collective bargaining agreement for the type of worker and location of the Work, whether or not the owner-operator is actually covered by such an agreement. A labor surcharge shall be added to the cost of labor

described herein in accordance with the provisions in paragraph 2 of Article 3.07.02.B. Labor.

3. Markup for Equipment rental and labor as provided in Article 3.07.02.G. Contractor's Fee shall be added to the direct cost of Equipment rental and labor, computed as provided herein.

F. Equipment Time: The rental time to be paid, or estimated to be paid, for Equipment on the Work shall be the time the Equipment is in productive operation on the Work being performed and shall include the time required to move the Equipment to the new location and return it to the original location or to another location, requiring no more time than that required to return it to its original location. Moving time shall not be paid if the Equipment is used on Work other than the extra Work. Loading and transporting costs shall be allowed, in lieu of moving time, when the Equipment is moved by means other than by its own power. No payment shall be made for loading and transporting costs when the Equipment is used at the site of the extra Work on other than the extra Work. The following shall be used in computing the rental time of Equipment on the Work:

1. When hourly rates are listed, any part of an hour less than 30 minutes of operation shall be considered to be a half hour of operation, and any part of an hour in excess of 30 minutes will be considered one (1) hour of operation.
2. When daily rates are listed, operation for any part of a day less than four (4) hours shall be considered to be a half Day of operation.
3. Rental time will not be allowed while Equipment is inoperative due to breakdowns or due to Contractor-caused Delays.

G. Contractor's Fee

- a. Work ordered on the basis of Time and Materials or forward-priced lump sum will be paid for at the estimated or actual and necessary cost as determined by the Engineer, plus allowances for overhead and profit; said allowances shall constitute the Contractor's Fee. For extra Work involving a combination of increases and decreases in the Work, the estimated or actual and necessary cost will be the arithmetic sum of the additive and deductive costs.
- b. To the total of the direct costs computed as provided above, there will be added a markup for overhead and profit as specified below. The markup shall constitute full compensation for all direct and indirect overhead costs and profit, which shall be deemed to include all items of expense not specifically listed above as direct costs. No separate allowance or itemization for overhead costs shall be allowed. The following list, though not intended to be comprehensive, indicates the types of costs that are

included in the markup for overhead and profit for all Change Orders, including Time-and-Material Work:

- i. Field and home office personnel, including, but not limited to, principals, project managers, superintendents, supervisory foremen, estimators, project engineers, detailers, draftspeople, schedulers, consultants, watchpersons, payroll clerks, administrative assistants, and secretaries.
- ii. All field and home office expenses, including, but not limited to, field trailers, parking, storage sheds, office equipment and supplies, telephone service at the Site, long-distance telephone calls, fax machines, computers and software, Internet and e-mail services, temporary utilities, sanitary facilities and services, janitorial services, small tools and Equipment with a cost under \$500 each, portable scaffolding, blocking, shores, appliances, job vehicles, security and fencing, conformance to all regulatory requirements, including compliance with safety regulations, safety programs and meetings, cartage, warranties, record documents, and all related maintenance costs.
- iii. Administrative functions, including, but not limited to, reviewing, coordinating, distributing, processing, posting, recording, estimating, negotiating, scheduling, schedule updating and revising, expediting, surveying, engineering, drawing, detailing, revising shop Drawings, preparing record Drawings, carting, cleaning, protecting the Work, and other incidental Work related to the Change Order.
- iv. All other costs and taxes required to be paid, but not included under direct costs as defined in this Article.

- c. The allowance for overhead and profit shall be made in accordance with the following schedule:

Element of the Work	Overhead and Profit Allowance
Labor	33 percent
Materials	15 percent
Equipment	15 percent

- d. Subcontractor Markup: Labor, Materials, and Equipment may be furnished by the Contractor or by a Subcontractor on behalf of the Contractor. When all or any part of the extra Work is performed by a Subcontractor, the allowance specified in the above subparagraph "c" shall only be applied to the labor, Material, and Equipment costs of the Subcontractors to which the Contractor may add no more than five (5) percent of the Subcontractor's total cost for the extra Work. In no case shall the sum of the individual markups applied to a Change Order

exceed ten (10) percent regardless of the number of Subcontractor tiers involved in performing the Work.

- e. Bond and Insurance: Only the actual cost of bond and insurance premiums required because of the Change Order, with no markup for overhead and profit, will be allowed.

3.07.03. Time-and-Materials Work

- A. If an NTE budget is established by the Engineer for Time-and-Material Work, the Contractor shall notify the Engineer when the cumulative costs incurred by the Contractor for Time-and-Material Work equal 80 percent of the preestablished budget. The Contractor may not be compensated for such Work that exceeds the NTE budget if the Contractor fails to provide the required notice before exceeding 80 percent of the established budget.
- B. If Work being performed on a Time-and-Material basis is expected to take more than one (1) month, the Engineer may, in its sole discretion, issue an allowance Change Order to allow timely payment to the Contractor for undisputed Work performed. The dollar value of the Change Order shall be an allowance amount equal to or greater than the NTE. Any amount remaining after all Time-and-Materials sheets are priced shall revert to the District.
- C. Cost of Work Documentation: For Time-and-Material Work, the Contractor shall furnish the Engineer extra work reports on a daily basis covering the direct costs of labor and Materials and charges for Equipment whether furnished by the Contractor, Subcontractor, or by other forces. The District shall provide the extra daily work report forms to the Contractor. The Contractor or an authorized agent shall sign each daily extra work report. The daily extra work report shall provide names and classifications of workers and hours worked; size, type, and identification number of Equipment; and the hours operated. Copies of certified payrolls and statements of fringe benefits shall substantiate labor charges. Valid copies of vendor invoices shall substantiate Material charges.
- D. The Engineer shall make any necessary adjustments. When these reports are agreed upon and signed by both parties, they shall become the basis of payment for the undisputed Work performed but shall not preclude subsequent adjustment based on a later audit.
- E. The Contractor shall inform the Engineer when extra Work will begin so that the District inspector can concur with the daily extra work reports. Failure to conform to these requirements may impact the Contractor's ability to receive proper compensation.
- F. The Contractor shall price and submit to the Engineer in both electronic format and in hard copy a native Microsoft Excel-based cost summary of the daily extra work reports on no less than a weekly basis. This summary report shall total all costs incurred to date and compare them to the NTE amount with a percent-spent-to-date amount prominently displayed. The Contractor shall be fully

responsible for tracking the costs and for notifying the Engineer when the costs exceed 80 percent of the NTE value. The summary report shall not be considered a substitute for the notice required in this Section.

3.07.04. Special Services

- A. Special services are defined as that Work characterized by extraordinary complexity, sophistication, or innovations, or a combination of the foregoing attributes that are unique to the construction industry. The following may be considered by the Engineer in reviewing or approving estimates for payment for special services:
 - 1. When the Engineer and the Contractor, by agreement, determine that a special service is required that cannot be performed by the forces of the Contractor or by those of any of its Subcontractors, the special service shall be performed by an entity especially skilled in the Work to be performed. After validation of invoices and determination of market values by the Engineer, invoices for special services based upon the current fair market value thereof may be accepted without complete itemization of labor, Materials, and Equipment rental costs if backup provided is acceptable to the Engineer.
 - 2. When the Contractor is required to perform Work necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the job site, charges for that portion of the Work performed at the off-site facility may, by agreement, be accepted as a special service, and accordingly, invoices for the Work may be accepted without detailed itemization at the Engineer's discretion.
- B. All invoices for special services shall be adjusted by deducting all trade discounts offered or available, whether the discounts were taken or not. In lieu of the allowances for overhead and profit on labor, Materials, and Equipment specified herein, a single allowance of ten (10) percent will be added to invoices for special services.

3.07.05. Compensation for Time Extensions

- A. Adjustments in compensation for adjustments in Contract Time(s) shall be allowed only for causes in Article 3.08.01. Change in Contract Time(s), General, paragraphs "E.1." through "E.5." computed in accordance with Article 3.07.02. Cost of Extra Work. No adjustments in compensation shall be allowed when District-caused Delays to a Controlling Item of Work and Contractor-caused Delays to a Controlling Item of Work occur concurrently or for causes stated in Article 3.08. Change in Contract Time(s).

3.08. Change in Contract Time(s)**3.08.01. General**

- A. The Contract Time(s) for the Contract is specified in the Special Provisions. The Contract Time(s) shall only be changed or adjusted by a fully executed Change Order or by a DCO.
- B. Notice and Substantiation: Any request for a change in the Contract Time(s) shall comply with the notice and substantiation requirements shown in Article 3.07. Change in Contract Price(s). No request for an adjustment in the Contract Time(s) will be valid if not submitted in accordance with the requirements of this Article.
- C. The Contract Time(s) shall only be extended when a Delay occurs that impacts a Controlling Item of Work as shown in the most recently accepted Detailed Progress Schedule. Time extensions shall be allowed only if the cause is beyond the control and without the fault or negligence of the Contractor. Time extensions may also be allowed when District-caused delays to a Controlling Item of Work and Contractor-caused Delays to a Controlling Item of Work occur concurrently. The Contractor shall be notified if the Engineer determines that a time extension is not justified.
- D. Types of Delays are defined below:
 - 1. Compensable Delay: An Excusable Delay for which the Contractor is entitled to receive additional compensation for delay-related costs if a) the delay was caused by the District or within its control or responsibility; b) the Delay results in additional costs incurred by the Contractor; and c) the Contractor has not assumed the risk of the Delay.
 - 2. Concurrent Delay: Two or more independent causes of Delay to the Contractor's performance of Work that meet all of the following criteria: a) the Delays occur at the same time during all or a portion of the delay period being considered; b) the Delays directly prevent the Contractor from performing a Controlling Item of Work; c) each Delay would have delayed the Contractor's performance of a Controlling Item of Work even in the absence of any of the other Delays;
 - 3. Excusable Delay: A Delay to the completion of a specified Contract Time(s) that is due to causes that are unforeseeable and beyond the control and responsibility of the Contractor for which a time extension may be granted.
 - 4. Inexcusable Delay: A Delay to the completion of a specified Contract Time(s) that was reasonably foreseeable or within the control and responsibility of the Contractor for which no compensation or time extension will be granted.

5. Non-compensable Delay: An Excusable Delay for which the Contractor may be entitled to an extension of time without additional compensation for delay-related costs.
- E. The Contract Time(s) shall be extended in an amount equal to time lost due to Excusable Delays if a request is made thereof as provided in this Article. An extension in Contract Time(s) shall only be granted for Days on which the Contractor is prevented from proceeding with at least 75 percent of the normal labor and Equipment force actually engaged on the Work by occurrences or conditions resulting immediately therefrom that impact a Controlling Item of Work as determined by the Engineer. Causes of such Delays shall include:
1. changes;
 2. failure of the District to furnish access, right of way, completed facilities of related projects, Drawings, Material, Equipment, or services for which the District is responsible;
 3. survey error by the District;
 4. suspension of Work pursuant to Article 5.06. Temporary Suspension of Work, paragraph C;
 5. differing site conditions;
 6. occurrences of a severe and unusual nature, including, but not limited to, acts of God, wars, riots, insurrections, fires, and excusable inclement weather. An "act of God" is defined as an earthquake, flood, cloudburst, cyclone, or other cataclysmic phenomena of nature beyond the power of the Contractor to foresee or to make preparation for in defense against, but does not include ordinary inclement weather; and
 7. act of the public enemy, act of another governmental entity, act of a public utility or other third party outside the control of the District, epidemic, quarantine restriction, freight embargo, strike, or labor dispute. A delay to a Subcontractor or Supplier due to the above circumstances will be taken into consideration for extensions to the time of completion.

3.08.02. Inclement Weather

- A. Inclement weather is any weather condition, the duration of which varies in excess of the average conditions expected, that is unusual for the particular time and place where the Work is to be performed or that could not have been reasonably anticipated by the Contractor as provided for in the Special Provisions.
- B. The Contract Time(s) shall only be extended for Days in excess of the number of Days of inclement weather where the Contractor is prevented by inclement weather, or by conditions resulting immediately therefrom, from proceeding with

at least 75 percent of the normal labor and Equipment force engaged on Controlling Items of Work as shown on the current, updated, and accepted Detailed Progress Schedule.

- C. Should the Contractor prepare to begin Work at the regular starting time at the beginning of any regular work shift on any Day on which inclement weather, or the conditions resulting from the weather, prevents Work from beginning at the usual starting time and the crew is dismissed as a result thereof, the Contractor shall be entitled to a one (1)-Day extension, whether or not conditions change thereafter during that Day and the major portion of the Day could be considered suitable for such construction operations.
- D. The Contractor shall include a calendar in all of its Progress Schedules that includes nonworking Days for the number of inclement weather Days specified in the Special Provisions. This calendar shall be used for all weather-sensitive Work.
- E. No extension in the Contract Time(s) due to inclement weather shall be considered until after the number of Days of inclement weather Days specified in the Special Provisions has been reached. No reduction in Contract Time(s) shall be made if the number of Days of inclement weather is not reached.
- F. The Contractor shall not be entitled to additional compensation for Delays caused by inclement weather.

3.09. Differing Conditions

- A. If any Work involves digging trenches or other excavations 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 a Regulated Material 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 in this Contract (Type I Differing Site Condition); and
 - 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 (Type II Differing Site Condition).
- B. The Contractor's written notice shall inform the District as to how such conditions affect its Work and shall recommend methods to overcome such conditions.
- C. Differing Conditions shall not include:

1. all that is indicated or reasonably interpreted from the Contract Documents or reference documents;
 2. all that could be seen on the Project site;
 3. conditions that are materially similar to or characteristically the same as those indicated or described in the Contract Documents or reference documents; and
 4. conditions where the location of a building component is in the proximity where indicated in or reasonably interpreted from the Contract Documents or reference documents.
- D. The District will promptly investigate the condition. If it finds that the conditions do materially so differ or do involve Regulated Material and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, the District may issue a Change Order or a DCO under the procedures described in this Contract. For Regulated Material, the District reserves the right to use other forces for exploratory work to identify and determine the extent of such material and for removing Regulated Material from such areas.
- E. In the event that a dispute arises between the District and the Contractor on whether the conditions materially differ or on the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by this Contract but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by this Contract or by law that pertain to the resolution of disputes and protests between the contracting parties.
- F. The Contractor shall be responsible for the safety and protection of the affected area of the Work for the duration of the District's investigation of potential differing conditions.

3.10. Cost Reduction Incentive

- A. The Contractor may submit to the Engineer, in writing, proposals for modifying the Drawings, Specifications, or other requirements of the Contract for the sole purpose of reducing the total cost of construction (known as value engineering change proposals) as provided for in State Specifications Section 4-1.07B wherein the words "State" and "Department" shall mean the District.

3.11. Disputes

- A. Claim: A written demand by the Contractor for an adjustment in the Contract Price(s) or in the Contract Time(s), or both, that is submitted in accordance with the requirements of the Contract Documents. Within the context of this Contract, a Claim is associated with a dispute as described in Articles 3.11. Disputes through 3.13. Dispute Review Board.

- B. It is the intention of this Article that disputes between parties arising under and by virtue of the Contract be brought to the attention of the Engineer at the earliest possible time in order that matters may be resolved, if possible, or other appropriate action promptly taken. Disputes are divided into four categories: (i) protest, (ii) notice, (iii) potential Claim, and (iv) Claim. During the course of the Project and up to receiving the proposed final estimate, the Contractor must submit a Contract dispute in the form of a written notice, protest, potential Claim, or Claim to the Engineer.
- C. Any disputes from Subcontractors or Suppliers that the Contractor passes through to the District for review and consideration shall be certified in the same manner the Contractor would certify its own disputes.

3.11.01. Protest

- A. If the Contractor considers any Work demanded to be outside of the requirements of the Contract, or considers any records or ruling or act or omission of the Engineer to be unfair, the Contractor shall immediately, upon such Work being demanded or such record or ruling being made, ask in writing for written instructions or decisions, whereupon the Contractor shall proceed without delay to perform the Work or to conform to the record or ruling and, within seven (7) Days after date of receipt of the written instructions or decisions, shall file a written protest with the Engineer stating clearly in detail the basis of the protest. Except for such protests as are made of record in the manner herein specified and within the time limit stated, the records, rulings, instructions, decisions, and acts or omissions of the Engineer shall be final and conclusive. Instructions and decisions of the Engineer contained in letters transmitting Drawings to the Contractor shall be considered as written instructions and decisions subject to protest as herein provided.

3.11.02. Notice of Potential Claims

- A. The Contractor is not entitled to additional compensation for any cause unless the Contractor submits to the District a written Notice of Potential Claim as hereinafter specified.
- B. The written Notice of Potential Claim must set forth the reasons for which the Contractor believes additional compensation and/or adjustments in the specified Contract Time(s) will or may be due, the nature of the costs and/or time involved, and, insofar as possible, the amount of the potential Claim. This notice as above required must have been submitted to the District before the Contractor performs the Work giving rise to the potential Claim for additional compensation and/or time, if based on an act or failure to act by the District, or in all other cases, within seven (7) Days after the happening of the event, thing, or occurrence giving rise to the potential Claim.
- C. The Notice of Potential Claim shall be certified as required in Article 3.12. Claims.

- D. Compliance with the foregoing shall not be a prerequisite to any Claim that is based on differences in measurement or errors of computations as to Contract quantities.

3.12. Claims

- A. Claims by the Contractor must be submitted to the Engineer before the date of final payment. The Claim shall relate directly to the circumstances addressed in the Notice of Potential Claim and may not raise new issues or circumstances that were not identified in the Notice of Potential Claim. Claims shall be in writing, shall specify the basis for each Claim, shall refer to the applicable provision or provisions of the Contract, and shall show the method of computation and the actual amount claimed. The Claim shall include documents necessary to substantiate the Claim and to establish liability, causation, and damages. All other factual data, including documentation of actual costs pertaining to that Claim, shall be submitted. Each issue contained in a Claim must include documentation, including background, chronology, Contractor's position, supporting documentation of merit, supporting documentation of damages, schedules (if appropriate), and productivity exhibits (if appropriate). The Claim shall clearly state that it is a Claim being submitted under this Article. Failure to submit a written Claim within the 30-Day period waives any right to recover compensation or to an extension in the Contract Time(s) due to the issues referenced in the Notice of Potential Claim. In addition to the foregoing, to substantiate any Claim, the Contractor shall provide the information required by Article 3.07. Change in Contract Price(s).
- B. Pricing of Claims shall be consistent and compliant with the requirements herein for adjustments in the Contract Price(s) and adjustments in the Contract Time(s).
- C. Claims must be certified using the following language:

I, _____, BEING THE _____ (MUST BE AN OFFICER) OF _____ (CONTRACTOR), DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA, AND DO PERSONALLY CERTIFY AND ATTEST THAT: I HAVE THOROUGHLY REVIEWED THE ATTACHED CLAIM FOR ADDITIONAL COMPENSATION AND/OR EXTENSION OF TIME FOR WORK PERFORMED BY THE CONTRACTOR AND/OR ANY SUBCONTRACTOR CLAIMS THAT ARE BEING PASSED THROUGH TO THE DISTRICT, AND KNOW ITS CONTENTS, AND SAID CLAIM IS TRUTHFUL AND ACCURATE; THAT THE AMOUNT REQUESTED ACCURATELY REFLECTS THE CONTRACT ADJUSTMENT FOR WHICH THE DISTRICT IS LIABLE; AND, FURTHER, THAT I HAVE REVIEWED AND AM FAMILIAR WITH BOTH 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.

- D. The District, or its authorized representatives, shall have access, upon reasonable notice during normal business hours, to Contractor and Subcontractor books, documents, and accounting records, including, but not limited to, Bid worksheets, Bids, Subcontractor Bids and proposals, estimates, cost accounting data, accounting records, payroll records, time sheets, canceled checks, profit and loss statements, balance sheets, Project correspondence, including, but not limited to, all correspondence between the Contractor and its sureties and Subcontractors/vendors, Project files, scheduling information, and other records of the Contractor and all Subcontractors directly or indirectly pertinent to the Work of the Project; original as well as changed and claimed extra Work to verify and evaluate the accuracy of cost and pricing data submitted with any Claim for which additional compensation has been requested or Notice of Potential Claim has been tendered. Such access shall include the right to examine and audit such records and make excerpts, transcriptions, and photocopies at the District's cost.
- E. The parties agree that in the event the Contractor or any Subcontractor fails to comply with this Article, the Claim will not be considered by the District. The Contractor agrees to impose upon its Subcontractors by appropriate subcontract provisions the obligations of this Article of the Standard Provisions.
- F. No Claim shall be considered where there has been a failure to comply with the requirements relative to protest and Notice of Potential Claim as written elsewhere in these Specifications.
- G. The presentation of a Claim shall be an express condition precedent to the Contractor's recourse to (i) informal conference; (ii) nonbinding mediation; and (iii) judicial arbitration to resolve disputes on construction Claims of three hundred seventy-five thousand dollars (\$375,000) or less or court action upon the Contract for Claims in excess of three hundred seventy-five thousand dollars (\$375,000) in compliance with Public Contract Code Section 20104 et seq.

3.12.01. Claims Less Than Fifty Thousand Dollars

- A. For Claims less than fifty thousand dollars (\$50,000), the Engineer shall respond in writing to any written Claim within 45 Days of receipt of the Claim or may request in writing within 30 Days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or Claims the District may have against the Contractor.
- B. If additional information is thereafter required, it shall be requested and provided pursuant to this Article upon mutual agreement of the Engineer and of the Contractor.
- C. The Engineer's written response to the Claim, as further documented, shall be submitted to the Contractor within 15 Days after receipt of further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

3.12.02. Claims from Fifty Thousand Dollars to Three Hundred and Seventy-Five Thousand Dollars

- A. For Claims greater than or equal to fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the Engineer shall respond in writing to any written Claims within 60 Days of receipt of the Claim or may request in writing within 30 Days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or Claims the District may have against the Contractor.
- B. If additional information is thereafter required, it shall be requested and provided pursuant to this Article upon mutual agreement of the Engineer and of the Contractor.
- C. The Engineer's written response to the Claims, as further documented, shall be submitted to the Contractor within 30 Days after receipt of further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

3.12.03. Informal Conferences

- A. If the Contractor disputes the Engineer's written response or if the Engineer fails to respond within the time prescribed, the Contractor may so notify the Engineer in writing either within 15 Days of receipt of the Engineer's response, or within 15 Days of the Engineer's failure to respond within the time prescribed respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon such demand, the Engineer shall schedule a meet-and-confer conference within 30 Days for settlement of the dispute.
- B. If, following the meet-and-confer conference, the Claim or any portion remains in dispute, the Contractor may file a Claim pursuant to California Government Code, Title 1, Division 3.6, Part 3, Chapter 1 commencing with Section 900 and Chapter 2 commencing with Section 910. For purposes of those provisions, the running of the period of time within which a Claim must be filed shall be tolled from the time the Contractor submits its written Claim until the time the Claim is denied, including any period of time utilized by the meet-and-confer process conference.

3.12.04. Civil Actions

- A. The following procedures are established for all civil actions filed to resolve Claims:
 - 1. Within 60 Days, but no earlier than 30 Days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 Days by both

parties of a disinterested third person as mediator, shall be commenced within 30 Days of the submittal, and shall be concluded within 15 Days from the commencement of the mediation unless a time requirement is extended upon a good-cause showing to the court.

2. If the matter remains in dispute, the parties agree to resolve their dispute by binding judicial arbitration pursuant to the Local Civil Rules of the County of Santa Clara Superior Court; notwithstanding, anything in such Local Civil Rules, the parties agree that the Civil Discovery Act of 1986 (Code of Civil Procedure, Title 3, Part 4, Chapter 3, Article 3 commencing with Section 2016 of Chapter 3 of Title 3 of Part 4 of Code of Civil Procedure) shall apply to any proceeding brought under this subdivision.
- B. In addition to the Code of Civil Procedure, Part 3, Title 3, Chapter 2.5 commencing with Section 1141.10, (i) arbitrators shall, when possible, be experienced in construction law; and (ii) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, also pay the attorney's fees on appeal of the other party.

3.13. Dispute Review Board

- A. When specified in the Special Provisions that a Dispute Review Board (DRB) process is required, the DRB process shall be in accordance with these Specification Provisions.

3.13.01. General

- A. A DRB is to assist in and facilitate the avoidance and timely, impartial resolution of disputes.
- B. All disputes referred to the DRB shall be subject to the dispute resolution process herein described as a condition precedent to initiating a subsequent dispute resolution process, such as arbitration or litigation, for that dispute.
- C. Except as explicitly otherwise provided, all disputes that are actionable under the provisions of the prime Contract between the District and the Contractor may be referred to the DRB.
- D. The DRB shall be utilized when dispute or potential Claim resolution at the Project level is unsuccessful. The DRB shall function until the Day of Acceptance of the Work by the District Board of Directors, at which time the work of the DRB will cease except for completion of unfinished dispute hearings and reports.
- E. The Contractor shall include in all subcontracts that Subcontractors and Suppliers of any tier (i) agree to submit Subcontractor Claims to the Contractor in a proper form and in sufficient time to allow processing by the Contractor in conformance with the DRB resolution specifications; (ii) agree to be bound by the

terms of the DRB provisions to the extent applicable to Subcontractor Claims; (iii) agree that, to the extent a Subcontractor Claim is involved, completion of all steps required under these DRB Special Provisions shall be a condition precedent to pursuit by the Subcontractor of other remedies permitted by law, including without limitation of a lawsuit against the Contractor; and (iv) agree that the existence of a dispute resolution process for disputes involving Subcontractor Claims shall not be deemed to create any Claim, right, or cause of action by any Subcontractor or Supplier against the District.

- F. The DRB reports shall not be binding on the District or on the Contractor and shall be admissible in subsequent dispute resolution proceedings.
- G. Immediately after award of the Contract, the District and the Contractor shall meet and discuss and establish the qualifications upon which nominees for the DRB are to be evaluated and jointly select prospective nominees.
- H. The District, the Contractor, and the DRB shall execute an agreement similar to the Three Party Agreement form included as an appendix to these Specifications. If there are any conflicts between the provisions of that agreement and these Specifications, the provisions of that agreement shall take precedence.
- I. The District and the Contractor shall each bear their respective in-house costs and costs of providing those DRB-related services for which responsibility has been allocated herein. The cost of the DRB panelists shall be split evenly between the Contractor and the District in the manner as described in paragraph "J" in this Article.
- J. The Contractor shall pay the full amount of any invoice or costs incurred from the DRB members in accordance with and as set forth in the DRB agreement and in these Specifications. The Contractor shall be reimbursed for 50 percent of these services utilizing the DRB Bid item, or Contract Change Order if no Bid item is specified.

3.13.02. DRB Qualifications

- A. Board members shall be experienced in the interpretation of Contract Documents and the resolution of construction disputes and in the type of construction to be performed.
- B. The following definitions apply for the purpose of setting forth experience and disclosure requirements.
 - 1. Party directly involved: The District or the Contractor of this Project.
 - 2. Contractor includes all joint-venture partners individually.
 - 3. Party indirectly involved: The construction manager, designers, architects, engineers, or other professional service firms or consultants,

joint-venture partners, Subcontractors of any tier, and Suppliers on this Project.

4. Financial ties: Any ownership interest, loans, receivables, or payables.

C. Eligibility

1. Direct Employment

- a. Current employees of any of the parties directly or indirectly involved are prohibited from serving as Board members.
- b. Prospective Board members who were past employees of one of the parties directly involved must obtain permission from the other party prior to appointment.
- c. Previous, direct employment by one of the parties indirectly involved must be disclosed.

2. Consulting Assignments

- a. Individuals who are employed in a consulting capacity by any of the parties directly involved are prohibited from serving as Board members.
- b. Prospective Board members who are currently employed as a consultant by one of the parties indirectly involved must obtain permission from the other party prior to appointment.
- c. Previous employment as a consultant by any party directly or indirectly involved must be disclosed.

3. Financial Ties

- a. Individuals with financial ties to any of the parties directly involved are prohibited from serving as Board members.
- b. Current financial ties to any of the parties indirectly involved must be disclosed.
- c. Previous financial ties with any party directly or indirectly involved must be disclosed.

4. Close Personal or Professional Relationships

- a. Individuals with close personal or professional relationships with a key member of any party directly involved are prohibited from serving as Board members.

- b. Such current relationships with a member of any party indirectly involved in the Contract must be disclosed.
 - c. All past personal or professional relationships with a key member of one of the parties directly or indirectly involved must be disclosed.
- 5. All past and current service as a Board member on projects where any of the parties directly or indirectly involved in this Contract were also involved must be disclosed.
- 6. No member shall have had substantial prior involvement in the Project in the judgment of the District and the Contractor.
- 7. Ongoing Responsibilities: While serving as a Board member on the DRB, no member shall participate in any discussion contemplating the creation of an agreement or making an agreement with any party directly or indirectly involved in the Contract regarding employment, or fee-based consulting services, or any other business arrangement after the Contract is completed.

3.13.03. Establishment of the DRB

- A. The District and the Contractor shall jointly participate in the evaluation and selection of prospective nominees for the DRB.
- B. The District and the Contractor shall provide to the DRB nominees a list of the construction manager, designers, architects, engineers, professional service firms, consultants, joint-venture partners, Subcontractors, and Suppliers involved or likely to be involved in the Project with a list of each party's key personnel.
- C. DRB nominees shall provide the following, pursuant to the above requirements and in addition to the nominee's full name and contact information, to both parties:
 - 1. Résumé showing construction experience qualifying the person as a DRB member.
 - 2. Résumé showing past DRB participation, if any. List each DRB assignment separately, indicating the name and location of the Project, dates of DRB service, name of owner, name of contractor, Contract value, nominating party, if applicable, names of the other Board members, and the number of disputes heard.
 - 3. Disclosure statement describing past, present, and anticipated relationships, including indirect relationships through the nominee's full-time employer, if any, to the Project, with all parties directly and indirectly involved in the Contract. Disclose close professional or personal relationships with key members of all of these parties.

- 4. Disclosure is a continuing obligation of all Board members throughout the life of the Contract.
- D. The District and the Contractor shall then have three (3) weeks to solicit and receive information from prospective candidates, and another two (2) weeks to review and to jointly agree on the final selection of the three (3) members to serve on the DRB. In the event that all three (3) members were not selected from the initial pool of nominees, the process shall be repeated.
- E. If the DRB Chair has not already been appointed as part of the selection process, as soon as is practicable, the Board members shall nominate the Chair and submit the nominee's résumé and request approval by the District and by the Contractor.

3.13.04. DRB Meetings

- A. The DRB shall visit the Project site and meet with representatives of the parties at periodic intervals and at other times requested by the parties.
- B. Each meeting shall consist of an informal discussion and a field observation of the Work in progress. The discussion and field observation shall be attended by personnel of the District and by the Contractor.

3.13.05. Dispute Resolution

- A. Prior Good-Faith Negotiation
 - 1. The District and the Contractor shall enter into good-faith negotiations to settle a dispute before referring the dispute to the DRB.
 - 2. These good-faith negotiations shall be founded on the principle of full and timely disclosure of each party's position to the other party, including the exchange of pertinent supporting records, analyses, expert reports, and similar documentation, and shall proceed without delay following the inception of the dispute. Such good-faith negotiations may involve the solicitation and rendering of a DRB advisory opinion as described herein.
- B. Dispute Referral
 - 1. A dispute may be referred to the DRB by either the District or by the Contractor. The dispute referral shall be made in writing to the DRB Chair with a copy concurrently provided to the other Board members and to the other party.
 - 2. If the Contract stipulates a precedent dispute resolution process prior to referral to the DRB and if one party fails to meet or adhere to the time requirements set forth under the Contract for this process, the other party may then refer the dispute to the DRB. In the event that the Contract does not specify a precedent process or specifies a precedent process

without time requirements, either party may refer the dispute to the DRB after passage of a reasonable period of time without progress toward a negotiated settlement; the DRB will determine if the dispute should be heard.

3. The dispute referral shall concisely define the nature and specifics of the dispute that are to be considered by the DRB and the scope of the recommendation requested.
4. The DRB Chair shall confer with the parties to establish a due date for delivering pre-hearing submittals, and a date, time, and location for convening the DRB hearing. Hearings shall be convened at the next periodic meeting, unless the parties agree to a shorter or longer period.

C. Pre-hearing Submittal

1. The District and the Contractor shall each prepare a pre-hearing submittal and transmit it to all three (3) members of the DRB and to the other party. The pre-hearing submittal, comprised of a position paper with such backup data as is referenced in the position paper, shall be tabbed, indexed, and the pages consecutively numbered.
2. Both position papers shall, at a minimum, contain the following:
 - a. A joint statement of the dispute and the scope of the desired report placed in a prominent location. The language of this joint statement shall summarize in a few sentences the nature of the dispute. If the parties are unable to agree on the wording of the joint statement of dispute, each party's position paper shall contain both statements and identify the party authoring each statement.
 - b. The basis and justification for the party's position with reference to Contract language and other supporting documents for each element of the dispute. To minimize duplication and repetitiveness, the parties may identify a common set of documents that will be referred to by both parties and submit it in a separate package.
 - c. When the scope of the hearing includes quantum, the referring party shall include a schedule impact analysis and full cost details, calculated in accordance with methods set forth in the Contract. This requirement does not apply if the report is to be made for entitlement alone or for entitlement with guidelines for quantum.
3. The number of copies, distribution requirements, and time for submittal will be established by the DRB and communicated to the parties by the Chair.

D. DRB Hearings

1. The District will arrange for or will provide hearing facilities at or near the site.
2. Attendance
 - a. The District and Contractor shall both limit attendance at the hearing to personnel directly involved in the dispute and participants in the good-faith negotiations that were conducted prior to submittal to the DRB except as noted below.
 - b. Prior to the date established for the hearing, each party shall provide a list of proposed attendees to the DRB and to the other party. In the event of any disagreement, the DRB shall make the final determination as to who attends the hearing.
 - c. Attorneys shall not participate in the hearing. Attorneys representing the parties are permitted to attend dispute hearings provided that prior permission is obtained from the other party.
 - d. At DRB hearings regarding Claims by a Subcontractor, including pass-through Claims by a lower tier Subcontractor or Supplier against the Contractor that are actionable by the Contractor against the District, the Contractor shall require and ensure that each Subcontractor involved in the dispute has presented an authorized representative with actual knowledge of the facts underlying the Subcontractor Claims.
3. The conduct of the hearing shall be established by the DRB according to its operating procedures and be generally consistent with the following guidelines:
 - a. The party who referred the dispute to the DRB shall present its position first, followed by the other party.
 - b. Both parties shall be allowed successive rebuttals, assuring a full and adequate opportunity to present their position, and to rebut the opposing party's position, until, in the DRB's opinion, all aspects of the dispute have been fully and fairly covered.
 - c. The DRB shall be fully prepared to, and may at any time, ask questions, request clarifications, or ask for additional data and/or for job records.
 - d. Either party may request that the DRB direct a question to or request a clarification from the other party. The DRB shall determine at what point in the proceedings such requests may be

made and if they will be granted. In general, the DRB will not allow one party to be questioned directly by the other party.

- e. In difficult or complex cases, additional hearings may be necessary to facilitate full consideration and understanding of the dispute.
- f. The DRB, in its discretion, may allow introduction of arguments, exhibits, handouts, or documentary evidence that were not included in that party's pre-hearing position paper and that had not been previously submitted to the other party. In such cases, the other party will be granted time to review and prepare a rebuttal to the new material.

E. Failure to Prepare a Pre-hearing Submittal or Attend a DRB Hearing

- 1. In the event that either party fails to deliver a pre-hearing submittal by the date established by the DRB, the DRB shall, at its discretion, determine whether the hearing shall proceed as originally scheduled or whether additional time shall be provided and a new date established. On the final date and time established for the hearing, the DRB shall proceed with the hearing utilizing the information that has been submitted.
- 2. In the event that some or all of the representatives of either party fail to appear at the appointed time of a DRB hearing, the DRB shall proceed with the hearing. The hearing shall take place as if all party representatives were in attendance. The DRB shall consider all evidence brought before it and hear testimony from those party representatives who are present.

F. Use of Outside Experts

- 1. By the District or by the Contractor
 - a. A party intending to offer an outside expert's analysis at the hearing shall disclose such intention in writing to the other party and to the DRB no less than 30 Days prior to the due date for delivering the pre-hearing submittal. The expert's name and a general statement of the area of the dispute that will be covered by his/her testimony shall be included in the disclosure.
 - b. Upon receipt of the above disclosure, the other party shall have the opportunity to secure the services of an outside expert to address or respond to those issues that may be raised by the other party's outside expert. The disclosure requirements shall be the same as that specified above, except the time requirement is ten (10) Days.

- c. The cost for securing outside expert services shall be borne by the party securing such services.
- 2. By the DRB
 - a. Prior to arranging for outside experts, the DRB shall obtain prior approval from the District and from the Contractor by providing:
 - 1. A statement explaining why the expert assistance is needed.
 - 2. An estimate of the cost of the expert assistance.
 - 3. A disclosure statement in accordance with the requirements of Article 3.13.03. Establishment of the DRB herein using the criteria established in Article 3.13.02. DRB Qualifications.
 - 4. A confidentiality statement, consistent with the DRB's agreement, executed by the proposed expert.
 - 5. The Contractor and the District shall equally bear the cost of the services of the outside expert employed by the DRB.
- G. DRB Report
 - 1. The DRB's recommendations for resolution of a dispute will be formalized in a written report with a format as determined by the DRB and signed by all Board members. The report should consist of a concise description of the dispute, short statements of each party's position, findings as to the facts of the dispute, discussion and rationale for the recommendation(s), and the recommendation(s). The report shall be submitted concurrently to the parties as soon as possible after completion of the hearing as agreed by all parties.
 - 2. If the DRB cannot arrive at a unanimous report, the Board shall prepare minority findings and recommendation(s), which, together with the majority findings and recommendation(s), shall comprise the DRB report. The report shall identify the issues of disagreement along with the reasons for disagreement.
 - 3. Clarification
 - a. Either party may request clarification of a report within ten (10) Days following receipt of the report. Within a reasonable period of time, the DRB shall provide written clarification to both parties.

- b. Requests for clarification shall be submitted in writing simultaneously to the DRB and to the other party.
- c. Only one request for clarification per dispute from each party shall be allowed.

4. Reconsideration

- a. Either party may request reconsideration of a report within ten (10) Days following receipt of the report when new information is obtained or developed that was not known at the time of the hearing, or when, in the party's opinion, the DRB misunderstood or failed to consider pertinent facts of the dispute. Within a reasonable period of time, the DRB shall provide written reconsideration to both parties.
- b. Requests for reconsideration shall be submitted in writing simultaneously to the DRB and to the other party.
- c. The Board will not entertain requests for reconsideration that amount to a renewal of a prior argument or an additional argument based on facts available at the time of the hearing.
- d. Only one request for reconsideration per dispute from each party shall be allowed.

5. Acceptance

- a. The District and the Contractor shall submit their written acceptance or rejection of the report concurrently to the other party and to the DRB within 14 Days of receipt of the report or following receipt of responses to requests for clarification or reconsideration.
- b. Failure by either party to accept or reject within the specified period shall be construed as acceptance of the report by that party.
- c. Acceptance by the District of a report on entitlement only, or on entitlement with guidelines for quantum, does not obligate the District to any particular quantum amount.

H. Advisory Opinions

- 1. An advisory opinion serves as a method for potentially avoiding a DRB hearing. It is not intended to replace the dispute resolution process specified herein but may be implemented as part of the good-faith negotiations conducted between the parties.

2. When mutually agreed to by the District and by the Contractor, the DRB may, at its discretion, provide an advisory opinion on any issue.

3.14 Escrow Bid Documents

- A. When required by the Special Provisions, Escrow Bid Documents shall be prepared and submitted as specified herein.

3.14.01. Introduction

- A. The Escrow Bid Documents shall include complete documentation of all backup information used in the preparation of the Contractor's Bid prices for this Project as described below. The Escrow Bid Documents of the successful Bidder will be held in escrow for the duration of the Contract or until all Claims are resolved, whichever is later.
- B. The Escrow Bid Documents are, and shall always remain, the property of the Contractor, subject to joint review by the District and by the Contractor as provided herein.
- C. The District stipulates and expressly acknowledges that the Escrow Bid Documents, as defined herein, constitute trade secrets.
 1. This acknowledgement is based on the District's express understanding that the information contained in the Escrow Bid Documents is not known outside the Bidder's business, is known only to a limited extent and by a limited number of employees of the Bidder, is safeguarded while in the Bidder's possession, and is extremely valuable to the Bidder's competitors by virtue of its reflecting Bidder's construction strategies, assumptions, and intended means, methods, and techniques of construction.
 2. The District acknowledges that the Bidder expended substantial sums of money in developing the information included in the Escrow Bid Documents and further acknowledges that it would be difficult for a competitor to replicate the information contained therein.
 3. The District further acknowledges that the Escrow Bid Documents and the information contained therein are being provided to the District only because it is an express prerequisite to award of the Contract.
 4. The District further acknowledges that the Escrow Bid Documents include a compilation of information used in the Bidder's business intended to give the Bidder an opportunity to obtain an advantage over competitors who do not know or do not use the contents of such information.
 5. The District further agrees, to the fullest extent permitted by law, to safeguard the Escrow Bid Documents against disclosure and not provide as public records.

- D. The successful Bidder agrees, as a condition of award of the Contract, that the Escrow Bid Documents constitute all of the information used in the preparation of its Bid for this Work and that no other Bid preparation information shall be considered in resolving disputes or Claims. The successful Bidder also agrees that nothing in the Escrow Bid Documents shall change or modify the terms or conditions of the Contract Documents.

3.14.02. Purpose

- A. The Escrow Bid Documents will be used solely to assist in the settlement of disputes and Claims. They will not be used for pre-award evaluation of the Contractor's anticipated methods of construction nor to assess the Contractor's qualifications for performing the Work.

3.14.03. Format and Contents

- A. The Bidders may submit the Escrow Bid Documents in their usual cost estimating format; a standard format is not required. However, sufficient detail shall be included to ensure that the Escrow Bid Documents enable complete understanding and proper interpretation of their content.
- B. The Escrow Bid Documents shall clearly itemize and separate the estimated cost of performing each major activity for each Bid item contained in the Bid. Bid items should be separated into sub-items to present a detailed cost estimate. Crews, Equipment, estimated quantities, and the rate of production shall be detailed. Increments of cost shall include, but shall not be limited to, such items as direct labor, permanent Material, supplies, consumables, subcontracts, Equipment charges, and allocation of overhead and profit. Plant, Equipment, and indirect costs should be detailed. All costs included in the Bid prices must be specifically identified and the methods of application described.
- C. The Escrow Bid Documents shall include all quantity takeoffs; calculations of rates of production and progress; copies of quotes from Subcontractors and Suppliers; and memoranda, narratives, and all other information used by the Bidder to arrive at the prices contained in its Bid.

3.14.04. Submittal

- A. The Escrow Bid Documents shall be submitted by the three (3) apparent low Bidders in a sealed container separate from their proposal no later than 5 p.m. on the second business day following the Bid opening Day. Each container shall be clearly marked on the outside with the Bidder's name, date of submittal, Project name, and the words "Escrow Bid Documents." Timely submission of these forms is considered material by the District.
- B. The Escrow Bid Documents shall be accompanied by a separate certification, "Bid Form 10 – Escrow Bid Documents Certification of Completeness," signed by an individual authorized by the Bidder to execute the bidding proposal and stating that the material in the Escrow Bid Documents constitutes all of the

documentary information used in preparation of this Bid, and that the Bidder's authorized individual has personally examined the contents of the Escrow Bid Documents container and has found that the documents in the container are complete.

- C. The Escrow Bid Documents of the apparent successful Bidder will be opened and examined by an appointed member of the District in the presence of the Bidder before the Contract is awarded. The apparent successful Bidder and applicable Subcontractors as stated in paragraph "G" in this Article shall attend this examination.
- D. This examination is to ensure that the Escrow Bid Documents are legible and complete. It will not include a review of, or constitute approval of, proposed construction methods, estimating assumptions, or interpretations of the Contract Documents. The examination will not alter any condition or term of the Contract. Should the examination indicate that any data is incomplete or missing, the Bidder shall supply the missing information within 24 hours or at such other time as is mutually agreeable.
- E. The timely submittal of complete Escrow Bid Documents is an essential element of the bidding process and a prerequisite to Contract award. Failure to provide the necessary Escrow Bid Documents will be sufficient cause for the District to reject the Bid as nonresponsive.
- F. If the Contract is not awarded to the apparent successful Bidder, the Escrow Bid Documents of the Bidder next to be considered for award shall be processed as described above. The Escrow Bid Documents of unsuccessful Bidders will be held in escrow until such time that they are returned unopened upon execution of the Contract by the successful Bidder.
- G. If any Bidder's proposal is based upon subcontracting any part of the work, each Subcontractor whose total subcontract price exceeds the percentage of the total Bid price specified in the Special Provisions shall provide separate Escrow Bid Documents to be included with those of the Bidder. Such documents shall be opened and reviewed in the presence of the Subcontractor only in the same manner and at the same time as the review described above for the apparent successful Bidder.
- H. It is the District's policy, in accordance with State law, that new Subcontractors are not accepted after award. However, if the Contractor wishes to lawfully change a Subcontractor or lawfully issue an additional subcontract for any portion of the Work after award and the District grants a specific exception to this policy, the District retains the right to require that the new Subcontractor submit Escrow Bid Documents before the new subcontract is approved.

3.14.05. Storage

- A. Upon completion of the examination, receipt of the apparent successful Bidder's Escrow Bid Documents will be acknowledged in writing by the District. The

documents will be placed in escrow for the life of the Contract at an escrow firm within the greater Santa Clara County area chosen by the District. The District will pay for storage and maintenance of the Escrow Bid Documents.

3.14.06. Examination

- A. The Escrow Bid Documents may be examined at any time deemed necessary by either the District or by the Contractor to assist in settling disputes and Claims.
- B. An examination of the Escrow Bid Documents is subject to the following conditions:
 - 1. As trade secrets, Escrow Bid Documents are proprietary and confidential.
 - 2. The District and the Contractor (and any Subcontractor to the extent Escrow Bid Documents are required by a Subcontractor) shall each designate in writing to the other party seven (7) Days prior to any examination representatives who are authorized to examine the Escrow Bid Documents. With the consent of both the District and the Contractor, members of the DRB may participate in the examination of the Escrow Bid Documents. No other person shall have access to the Escrow Bid Documents.
 - 3. Access to the Escrow Bid Documents may take place only in the presence of a duly designated representative of both the District and the Contractor. If the Contractor fails to designate a representative or fails to appear for joint examination on seven (7) Days' notice, then the District representative may examine the Escrow Bid Documents upon an additional three (3) Days' notice.

3.14.07. Final Deposition

- A. The Escrow Bid Documents will be returned to the Contractor after the Work has been completed and accepted and after all Claims and disputes involving this Work have been settled. The Contractor will thereupon be required to waive, in writing, any right to lodge further Claims involving this Work.

3.15. Partnering**3.15.01. Partnering Relationship**

- A. The District encourages a partnering relationship with the Contractor to effectively complete the Contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and to mutually resolve conflicts at the lowest possible management level.

3.15.02. Professionally Facilitated Project Partnering

- A. To further the partnering relationship, Professionally Facilitated Project Partnering can be implemented by one of two methods:
 - 1. The District requires Professionally Facilitated Project Partnering. The Contractor shall comply with the Special Provisions regarding this requirement.
 - 2. The Contractor submits a written request for Professionally Facilitated Project Partnering. However, this method can only be implemented if the Engineer approves the request in writing.
- B. Implementation of Professionally Facilitated Project Partnering
 - 1. Scheduling the Professionally Facilitated Project Partnering workshops, selecting the Professional Partnering Facilitator and workshop site, and other administrative details shall be as agreed to by both parties.
 - 2. Partnering workshops will be held on a quarterly basis during construction, or as needed, and as determined by the Engineer and by the Contractor. Both parties will determine workshop attendees, agenda, and duration. Persons required to be in attendance will be the Engineer and/or the Engineer's authorized agents and key Project personnel; the Contractor's authorized representative, on-site Project manager, and key Project supervision personnel of both the prime and principal Subcontractors and Suppliers; and other personnel as deemed necessary by the District and by the Contractor.
 - 3. The Contractor shall secure the Professional Partnering Facilitator and the off-site meeting room. The District will pay in full for the services of a Professional Partnering Facilitator and for the off-site meeting room based on invoices priced without markup. Payment for these services shall be made utilizing the Professionally Facilitated Project Partnering Bid item or Contract Change Order if no Bid item is specified. All other costs associated with the partnering workshops will be borne separately by the party incurring the costs (e.g., wages and travel expenses); no additional payment shall be made.
- C. The establishment of Professionally Facilitated Project Partnering will not change or modify the terms and conditions of the Contract and will not relieve either party of its legal requirements of the Contract.

3.16. Claims and Disputes per Public Contract Code Section 9204

- A. Public Contract Code Section 9204 (PCC 9204) applies to all contracts entered into on or after January 1, 2017. PCC 9204 shall remain in effect only until January 1, 2020, and as of that date is repealed, unless a later enacted statute,

that is enacted before January 1, 2020, deletes or extends that date. The provisions of PCC 9204 are set forth below.

- B. The Legislature has found and declared that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner. PCC 9204 shall apply to any claim by a contractor in connection with a public works project.
- C. Prior to submitting a claim per PCC 9204, the Contractor shall comply with Article 3.11.01. Protest, Article 3.11.02 Notice of Potential Claims, 3.12. Claims, A. through F.
- D. For purposes of PCC 9204, the following definitions apply:
 - 1. "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:
 - a. A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.
 - b. Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.
 - c. Payment of an amount that is disputed by the public entity.
 - 2. "Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.
 - 3. "Public entity" means, without limitation, except as provided in subparagraph (b), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.
 - 4. "Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.

5. "Subcontractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.
- E.
 1. a. Upon receipt of a claim pursuant to PCC 9204, the District shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the District and Contractor may, by mutual agreement, extend the time period provided in this Article.
 - 1.b. The Contractor shall furnish reasonable documentation to support the claim.
 - 1.c. If the District needs approval from the Board to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the claim, and the Board does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three days following the next Board meeting after the 45-day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.
 - 1.d. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the District issues its written statement. If the District fails to issue a written statement, paragraph 3. below shall apply.
 - 2.a. If the Contractor disputes the District's written response, or if the District fails to respond to a claim issued pursuant to this Article within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the District shall schedule a meet and confer conference within 30 days for settlement of the dispute.
 - 2.b. Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the District shall provide the Contractor a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the District issues its written statement. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the District and the Contractor sharing the associated costs equally. The District and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall

select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this Article.

- 2.c. For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this Article.
- 2.d. Unless otherwise agreed to by the District and the Contractor in writing, the mediation conducted pursuant to this Article shall excuse any further obligation under Public Contract Code Section 20104.4 (see Article 3.12.01. Claims Less Than Fifty Thousand Dollars through Article 3.12.04. Civil Actions) to mediate after litigation has been commenced.
- 2.e. This Article does not preclude the District from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this Article does not resolve the parties' dispute.
- 3. Failure by the District to respond to a claim from a Contractor within the time periods described in this Article shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the District's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this Article, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the Contractor.
- 4. Amounts not paid in a timely manner as required by this Article shall bear interest at 7 percent per annum.
- 5. If a Subcontractor or a lower tier Subcontractor lacks legal standing to assert a claim against the District because privity of contract does not exist, the Contractor may present to the District a claim on behalf of a Subcontractor or lower tier Subcontractor. A Subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier Subcontractor, that the Contractor present a claim for work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the claim be presented to the District shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the claim to the District and, if the original

Contractor did not present the claim, provide the Subcontractor with a statement of the reasons for not having done so.

- F. A waiver of the rights granted by PCC 9204 is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of PCC 9204, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in PCC 9204.
- G. Nothing in PCC 9204 shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

SECTION 4. LEGAL REGULATIONS AND RESPONSIBILITY

4.01. Laws to be Observed

- A. The Contractor shall remain informed of and in compliance with the latest version of applicable existing and future Federal, State, County, and Municipal laws, ordinances, rules, and regulations, including, but not limited to, those cited herein.

4.02. Equal Opportunity Requirements

- A. The Santa Clara Valley Water District is an equal opportunity employer and requires its contractors to have and adhere to a policy of equal opportunity and nondiscrimination. In the performance of the Agreement, the Contractor will comply with all applicable Federal, State, Local Laws and Regulations, and will not discriminate against any Subcontractor, employee, or applicant for employment in the recruitment, hiring, employment, utilization, promotion, classification or reclassification, transfer, recruitment advertising, evaluation, treatment, demotion, layoff, termination, rates of pay or other forms of compensation, and selection for professional development training (including apprenticeship); or against any other person on the basis of sex (which includes pregnancy, childbirth, breastfeeding, and medical conditions related to pregnancy, childbirth, or breastfeeding); race, religion, color, national origin (including language-use restrictions); ancestry, religious creed (including religious dress and grooming practices); political affiliation, disability (mental and physical, including HIV or AIDS); medical condition (cancer and genetic characteristics) and genetic information; marital status, parental status, gender, age (40 and over); pregnancy, military, and veteran status; sexual orientation, gender identity, and gender expression; the exercise of family and medical care leave; the exercise of pregnancy disability leave; or the request, exercise, or need for reasonable accommodation.
- B. The Contractor's policy must conform with applicable State and Federal guidelines, including the Federal Equal Opportunity Clause, "Section 60-1.4 of Title 41, Part 60 of the Code of Federal Regulations;" Title VII of the Civil Rights Act of 1964 as amended; the American's with Disabilities Act of 1990; the Rehabilitation Act of 1973 (Sections 503 and 504); the Age Discrimination Act of 1975 (42 U.S.C. Section 6101 et. seq.); California Fair Employment and Housing Act (Government Code Section 12900 et. seq.); and California Labor Code Sections 1101 and 1102.

4.03. Employment of Labor

- A. In the employment of labor in the performance of the Contract, the District desires that the Contractor and all Subcontractors give first consideration to residents of the District.

4.04. Prevailing Wages

- A. The Work to be performed pursuant to this Contract is “public works” subject to the California Prevailing Wage Law, California Labor Code Section 1720, et seq. and the applicable implementing regulations (the Prevailing Wage Law) with which the Contractor must comply. The General Prevailing Wage Rates issued by the California Department of Industrial Relations may be adjusted by the State during the term of this Contract. Notwithstanding any other provisions of this Contract, the Contractor will not be entitled to any adjustment in compensation in the event there are adjustments to the General Prevailing Wage Rates.
1. In accordance with the Prevailing Wage Law, the Director of the Department of Industrial Relations has ascertained the general prevailing rate of wages and employer payments for health and welfare, pension, vacation, and similar purposes available to the particular craft, classification, or type of workers employed on the Work. These rates are set forth in the latest determination obtained from the Director, which is on file in the office of the Clerk of the Board of Directors and incorporated herein by reference the same as though set out in full. The rates are also available on the State of California Department of Industrial Relations website at <http://www.dir.ca.gov>.
 2. The Contractor shall pay a penalty to the District of \$200 for each Day, or portion thereof, for each worker paid less than the stipulated prevailing rate for any public Work done under the Contract by the Contractor or by any Subcontractor in violation of the provisions of the Prevailing Wage Law.
- B. Each Contractor and Subcontractor shall keep an accurate payroll record, showing the name, address, Social Security number, work classification, straight time, and overtime hours worked each Day and week, and the actual per-diem wages paid to each journeyman, apprentice, worker, or other employee by him/her in connection with the public Work. The payroll records shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor in accordance with the Prevailing Wage Law.
1. The Contractor and each Subcontractor, pursuant to California Labor Code Section 1776, must submit certified weekly payroll(s) within ten (10) Days after the Owner’s request for submission of certified weekly payroll records. The certified payroll(s) must include the date of actual payment of wages for each worker employed on the Project and a breakdown of each payment, including all fringe benefits included in such wage for each worker.
 2. In the event that the Contractor fails to comply with the ten (10)-Day submission deadline of California Labor Code Section 1776, the Contractor shall pay a penalty to the District of \$100 for each calendar Day or portion thereof, for each worker, until the Contractor achieves compliance with Section 1776.

3. The Contractor shall inform the District of the location of the payroll records—including the street address, city, and county—and shall, within five (5) working Days, provide a notice of a change in location and address. The Contractor is responsible for compliance with payroll record requirements imposed by Section 1776 of the Labor Code.
- C. The Contractor must submit certified weekly payroll(s) in support of the monthly request for payment as required herein. Certified weekly payroll(s) must be submitted within ten (10) calendar Days from the progress payment end date. Payroll(s) shall contain the full name, address, and Social Security number of each employee; his/her correct classification and rate of pay; daily and weekly number of hours worked; itemized deductions made; and actual wages paid. Payroll shall also indicate apprentices and ratio of apprentices to journeymen. The employee's address and Social Security number need only appear on the first payroll on which his/her name appears. The payroll(s) shall be accompanied by a Statement of Compliance signed by the employer or agent indicating that the payroll(s) is correct and complete and that the wage rates contained therein are not less than those required by the Contract. The Statement of Compliance shall be on forms furnished by the District or on any form with identical wording. The Contractor shall be responsible for the submission of copies of the payroll(s) of all Subcontractors, including sub-Subcontractors.
1. This project is subject to compliance monitoring and enforcement by the State of California Department of Industrial Relations. The Contractor and Subcontractors must furnish the records specified in Section 1776 directly to the Labor Commissioner in the following manner: monthly, in a format prescribed by the Labor Commissioner.
 2. The District will take all actions reasonably necessary to enforce the prevailing wage requirements of this Contract, including retaining progress payment funds not supported by certified payroll(s).
 3. Retentions for failure to submit satisfactory payroll(s) are in addition to all other retentions provided for in the Contract.
- D. The Contractor and each Subcontractor shall preserve their respective payroll records for a period of four (4) years from the date of filing a Notice of Completion and Acceptance under the Contract.
1. The work of installing, assembling, repairing, or reconditioning—or other work of any nature on machinery, Equipment, or tools used in or upon the Work—is considered a part of the Work to be performed under the Contract; any laborers, workers, or mechanics working on such machinery, Equipment, or tools are subject to all of the requirements relating to labor set forth in the Contract.
 2. The construction, erection, and operation of Material production, proportioning, or mixing plants from which Material is used wholly on the Contract or on contracts under the supervision of the District shall be

considered a part of the Work to be performed under the Contract; any laborers, workers, or mechanics working on such plants shall be subject to all of the requirements relating to labor set forth in the Contract.

4.05. Hours of Labor

- A. Eight (8) hours of labor constitutes a legal Day of work. The Contractor shall pay a penalty to the District of \$25 for each worker employed in the execution of the Contract by the Contractor or by any Subcontractor for each Day during which such worker is required or permitted to labor more than eight (8) hours in violation of Labor Code Sections 1810 to 1815, inclusive.

4.06. Apprentices

- A. The Contractor shall comply with Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning the employment of apprentices by the Contractor or by any Subcontractor.
- B. Section 1777.5 requires the Contractor or Subcontractor employing persons as defined in any apprenticeable occupation to apply for a certificate of approval to the joint apprenticeship committee that is nearest the site of the public works project and that administers the apprenticeship program in that trade. The certificate will also fix the ratio of apprentices to journeymen that will be used in the performance of the Contract. The ratio of work performed by apprentices to journeymen in such cases shall not be less than one (1) hour to five (5) hours, except when the committee finds that any one of the following conditions are met:
 - 1. In the event unemployment for the previous three (3)-month period in the Project site area exceeds an average of 15 percent; or
 - 2. In the event the number of apprentices in the area exceeds a ratio of one (1) to five (5); or
 - 3. If there is a showing that the apprenticeable craft or trade is replacing at least one thirtieth of its journeymen annually through apprenticeship training either (i) on a statewide basis, or (ii) on a local basis; or
 - 4. If assignment of an apprentice to any Work performed under a public works contract would create a condition that would jeopardize his/her life; or the life, safety, or property of fellow employees; or the public at large; or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.
- C. The Contractor is required to make contributions to funds established for the administration of apprenticeship programs if the Contractor employs registered apprentices or journeymen in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

- D. The Contractor and any Subcontractor shall comply with the requirements of Sections 1777.5 and 1777.6 in the employment of apprentices.
- E. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex officio the Administrator of Apprenticeship, San Francisco, CA, or from the Division of Apprenticeship Standards and its branch offices.

4.07. Permits and Licenses

- A. The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the prosecution of the Work, except as provided in the Special Provisions.

4.08. Patents and Copyrights

- A. The Contractor shall assume all costs, including any costs of defense arising from the use of any copyrighted composition, secret process, patented or unpatented invention, article, Equipment, device, or appliance manufactured, furnished, or used in the performance of the Contract, including their use by the District, unless otherwise specifically stipulated in the Specifications.

4.09. Interference With Fire Hydrants, Highways, and Fences

- A. The Contractor shall conduct operations so as not to close or obstruct any portion of any highway, road, or street, or prevent in any way free access to fire hydrants until permits have been obtained thereof from the proper authorities. If any highway required to be kept open shall be rendered unsafe by the Contractor's operations, the Contractor shall make such repairs or provide such temporary guards as shall be acceptable to the authorities having jurisdiction and to the Engineer. Any highway or street maintenance or repair work required by local authorities in connection with necessary operations under the Contract shall be performed by the Contractor at the Contractor's own cost and expense. Fences subject to interference shall be maintained as effective barriers consistent with the original intent; upon approval of the Engineer, they may be moved or rearranged to facilitate prosecution of the Work until the Work is finished, after which they shall be restored to their original location in an equal or better condition than existed prior to rearrangement.

4.10. Preservation of Property

- A. The Contractor shall exercise due care to avoid damage to existing improvements, utility facilities, and adjacent property, real and personal. The fact that any existing underground improvement or facility is not shown on the Drawings shall not relieve the Contractor of the responsibility to ascertain the existence of any underground improvement or facility that may be subject to damage by reason of the Contractor's operations.

- B. Any damage to improvements or property—whether above or below ground, private or public, within or adjacent to the Project limits—arising from or in consequence of the performance of the Contract shall be promptly repaired by the Contractor.
- C. If the Engineer requires such repair to be made prior to the execution or continued performance of any part of the Work included in this Contract, the Engineer will so notify the Contractor who shall delay or discontinue the performance of that part of the Work until the necessary repair has been made. Such delay shall be considered Inexcusable Delay; no extension of time for completion of the Contract will be allowed. The Contractor will be subject to Contract damages for any impact to the Contract Milestones resulting from its damage to property or from failure to make timely repairs.
- D. When ordered by the Engineer to make any such repair, the Contractor shall start work thereon within four (4) hours and shall prosecute the same with diligence to completion. Upon failure of the Contractor to so comply with such order, or upon the Contractor's failure to make immediate emergency repairs reasonably determined by the Engineer to be necessary in the best interests of the public, the Engineer shall have authority to cause the repair to be made and to deduct the costs thereof from any money due, or which may become due, the Contractor.
- E. In an emergency affecting the safety of life or property, including adjoining property, the Contractor shall act to prevent, to the extent possible, such threatened loss or injury whether instructed or not to do so by the Engineer.

4.11. Contractor's Responsibility for the Work

- A. Until the Acceptance of the Work, the Contractor shall have the charge and care of the Work and of the Material to be used therein and shall bear the risk of injury, loss, or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from non-execution of the Work. The Material to be used in the Work include both those furnished by the District and those furnished by the Contractor, including Material for which the Contractor has received partial payment.

4.12. Indemnification

- A. The Contractor shall defend, indemnify, and hold harmless the District and its Directors, officers, employees, and agents from liability, loss, suits, actions, or claims brought for or on account of violation of Laws, Ordinances, Rules, or Regulations, or injury, damage, or loss (including death) caused by acts or omissions of the Contractor, its employees, or its agents.
- B. The Contractor shall defend, indemnify, and hold harmless the agencies/parties named in Article 14.16. Insurance, of the Special Provisions—including their officers, employees, and agents—from liability, loss, suits, actions, or claims brought for or on account of any violation of Laws, Ordinances, Rules, or

Regulations, or injury, damage, or loss (including death) caused by acts or omissions of the Contractor, its employees, or its agents.

4.13. Contractor's Insurance**4.13.01. General**

- A. The insurance procured by the Contractor for the benefit of Santa Clara Valley Water District shall not be deemed to release or limit any liability of the Contractor. Damages recoverable by Santa Clara Valley Water District for any liability of the Contractor shall, in any event, not be limited by the amount of the required insurance coverage. Failure by the Contractor to maintain all required insurance at all times during the performance of this Contract and until acceptance by the District, shall, at the discretion of the District, result in temporary suspension of Work, or termination of control, or termination of the Contract as indicated herein, and shall not be a basis for a time extension. The Contractor's insurance shall be primary with respect to any other insurance that may be carried by Santa Clara Valley Water District.
- B. The District has the right to require the Contractor to provide complete, certified copies of all required pertinent insurance policies, including endorsements affecting the coverage required by the Agreement.
- C. The specific insurance requirements and coverages shall be in accordance with the Special Provisions.

4.13.02. Insurance on Work and Material

- A. The Contractor shall secure and maintain such direct damage insurance against such perils as the Contractor may deem necessary to protect the Work called for in this Contract, including Work completed, Material in place or to be used in the performance of this Contract, and such other miscellaneous items as may be necessary to the performance of this Contract.

4.14. Payment of Taxes

- A. Except as otherwise specifically provided in the Special Provisions, the Contract Price(s) shall include full compensation for all current and future taxes that the Contractor is required to pay, whether imposed by Federal, State, or Local government; no tax exemption certificate or any other document designed to exempt the Contractor from payment of tax will be furnished to the Contractor by the District.

4.15. Cooperation With Others

- A. The District reserves the right to do other work on or near the Project. The Contractor shall cooperate with others and coordinate its Work with planned or ongoing work of the District or of other District contractors within or adjacent to the limits of the Contract Work. The Contractor shall conduct the Work so as to

facilitate work by the District or by others and prevent delay, additional expense, or hindrance thereto, and allow for the satisfactory prosecution of the Work.

- B. The Contractor shall request from, and exchange with others, Drawings, data, and information as necessary to ensure proper completion of the Project and of the work of others. The Contractor shall furnish to the Engineer copies of correspondence and Drawings exchanged with other contractors.
- C. The Contractor shall complete the following activities as requested by the Engineer to assist in the coordination of Contract Work with work by others: attend planning meetings; review and comment on Project documents relative to coordination aspects; schedule Work to promote efficient installation of all improvements; move Material, Equipment, or vehicles to allow work by others to proceed; and other reasonable activities.
- D. No additional payment shall be made or Claims considered for Delay due to the Contractor's failure to coordinate the Work or because of conflicts with other construction, including that of the District.
- E. The Contractor agrees to reimburse the District for any payments made to other Contractors that were incurred as a result of the Contractor's Inexcusable Delays.

4.16. Property Rights in Material

- A. Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the Material used after they have been attached or affixed to the Work or after payment has been made for 90 percent of the value of Material delivered to the site of the Work, whether or not they have been so attached or affixed. All such Materials shall become the property of the District upon being so attached or affixed or upon payment of 90 percent of the value of Material delivered by the Contractor to the worksite and not used as provided herein.

4.17. Rights in Land and Improvements

- A. Nothing in these Standards shall be construed as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure, or building within the limits of the Contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the District and any owner, former owner, or tenant of such land, structure, or building.

4.18. Title to Material Found on the Work

- A. The title to all water and to the right to use all water; and all soil, stone, gravel, sand, minerals; and all other Material developed or obtained in the excavation or other operations by the Contractor, or by any Subcontractor, or by any of their employees, and the right to use or dispose of the same are hereby expressly reserved by the District; neither the Contractor, nor any Subcontractor, nor any of

their employees shall have any right, title, or interest in, or to any part thereof; neither shall they, nor any of them, assert or make any claim thereto. The Contractor may be permitted to use in the Work, without charge, any such Material that meet the requirements of these Specifications.

4.19. Trespass

- A. The Contractor shall be responsible for all damage or injury that may be caused on or to any property by trespass by the Contractor, any Subcontractor, or any of their employees in the course of their employment, whether the said trespass was committed with or without the consent or knowledge of the Contractor.

4.20. Subcontracting

- A. The Contractor shall comply with the Subletting and Subcontracting Fair Practices Act commencing with Public Contract Code Section 4100. Violations shall subject the Contractor to penalties described therein.
- B. For the purposes of consenting to substitution of a designated Subcontractor in accordance with Public Contract Code Section 4107, 4109, and 4110, the Administrative Hearing Officer will be in accordance with Article 3.02. Engineer.
- C. The Engineer reserves the right to order the Contractor to terminate any subcontract if, in the Engineer's opinion, the Subcontractor fails to comply with the applicable requirements of this Contract.
- D. Nothing herein contained shall create any contractual relation between any Subcontractor and the District or shall relieve the Contractor of any liability or obligation hereunder.
- E. All contracts with Subcontractors and lower-tier Subcontractors and purchase agreements with Suppliers and lower-tier Suppliers shall provide that they are freely assignable to the District or to the District's designee under the following conditions:
 - 1. The District terminates the Contractor's control of the Work in accordance with Article 4.22. Termination of Control; and
 - 2. The District directs such assignment.

4.21. Assignment of Antitrust Claims

- A. Government Code Sections 4550 through 4554 pertaining to the assignment of antitrust claims are incorporated herein in full by this reference.

4.22. Termination of Control

- A. The District may terminate the Contractor's control of the Work at any time upon a determination that the same is in the best interests of the District.

4.23. Termination of Contract

- A. The District may terminate the Contract at any time upon a determination that the same is in the best interests of the District. Upon such termination, the rights, duties, and obligations of the parties shall be as stated in Section 8-1.14 of the 2010 State Specifications, wherein the words "Director" and "Engineer" shall mean the Engineer and the words "State" and "Department" shall mean District. Payment after termination of Contract shall be in accordance with the District's Standard and Special Provisions.

4.24. Contractor's Cost Data

- A. The District or any of its duly authorized representatives shall, until the expiration of four (4) years after filing the Notice of Completion and Acceptance under this Contract or any subcontract under it, have access to and the right to examine any Contractor or Subcontractor payroll, records of personnel, invoices of Material, records of plant and Equipment costs, and any and all other directly pertinent books, documents, papers, and records of such Contractor or Subcontractors involving transactions related to the said Contract or subcontracts. In the event State or Federal funds are involved in financing the Project, the State or Federal Government shall have the same rights of inspection as the District.

4.25. Coordination With Utilities

- A. In general, the location of existing utility facilities as shown on the Drawings is approximate. This information has been obtained from utility maps furnished by the various agencies involved; the District does not guarantee either the correctness of the locations or the extent of such locations.
- B. California Government Code Section 4215 does not require public agencies to indicate the presence of service laterals or appurtenances whenever the presence of such utilities can be inferred from the presence of other visible facilities (e.g., buildings, meter boxes, junction boxes) on or adjacent to the construction site. Service laterals (e.g., house sanitary, water, electrical, gas, cable TV, storm or telephone cables, appurtenances) may not all be shown on the Drawings. No changes in the Contract Price(s) or the Contract Time(s) shall be made due to the presence of unidentified or incorrectly located service laterals or appurtenances. It shall be the responsibility of the Contractor to ascertain the exact location of the utility facilities.
- C. Unless otherwise indicated on the Drawings or specified in the Specifications, the Contractor shall maintain in service all utilities, including house services, power, lighting, and telephone conduits, and any other surface or subsurface structure or facility of any nature that may be affected by the Work; provided, however, that the Contractor, for convenience, may arrange with the owner to temporarily disconnect house service lines or other facilities along the line of the Work. The cost of disconnecting and restoring such utilities shall be borne by the Contractor.

- D. In the event that a main or trunk-line utility facility is encountered that interferes with the Work and that is neither shown on the Drawings nor specified in the Specifications, the Contractor shall immediately notify the District in writing. The District may have the appropriate utility company or public agency relocate the facility, or the District may direct the Contractor to relocate the facility in accordance with Article 3.06. Changes in the Work.
- E. In the event that a main or trunk-line utility facility is encountered that interferes with the Work and that the Contractor believes is not shown on the Drawings or indicated in the Specifications with Reasonable Accuracy, the Contractor shall immediately notify the District in writing.
 - 1. If the Engineer determines that the main or trunk-line utility facility was shown on the Drawings or was indicated in the Specifications with Reasonable Accuracy, the Contractor shall be solely responsible for relocation or removal; no additional time shall be granted nor additional payment made, for any additional Work required.
 - 2. If the Engineer determines that the main or trunk-line utility facility was not shown on the Drawings or was not indicated in the Specifications with Reasonable Accuracy, the District may have the appropriate utility company or public agency relocate the facility, or the District may direct the Contractor to relocate the facility in accordance with Article 3.06. Changes in the Work.
- F. When a delay in the completion of the Project is caused by the failure of the District or by the owner of a utility facility to provide for removal or relocation of existing main or trunk-line utility facilities that are not shown on the Drawings or that are not indicated in the Specifications or that are not shown on the Drawings or indicated in the Specifications with Reasonable Accuracy, the Contract Time(s) shall be extended in accordance with Article 3.08. Change in Contract Time(s).

4.26. Asbestos-Related Work

- A. The Contractor shall comply with California Business and Professions Code Section 7058.5, which states that no Contractor shall engage in asbestos-related work, as defined, unless certified by the Contractor's State License Board to do so.
- B. The Contractor shall comply with California Labor Code Section 6501.5 relative to asbestos related work, the applicable provisions of the Code of Regulations, Title 8 General Industry Safety Orders, and BAAQMD Regulation 11 Rule 2.

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SECTION 5. PROSECUTION AND PROGRESS OF WORK

5.01. Assignment

- A. The performance of the Contract may not be assigned except upon consent of the Board of Directors. Consent shall not be given to any proposed assignment that would relieve the original Contractor or surety of its responsibilities set forth in the Contract.
- B. The Contractor may assign moneys due in accordance with the Contract; such assignment shall be recognized by the District if given proper notice thereof, to the extent permitted by law. Assignment of moneys shall be subject to all proper setoffs in favor of the District and to all deductions provided for in the Contract. All money withheld, whether assigned or not, shall be controlled by the District.

5.02. Notice to Proceed

- A. The Notice to Proceed (NTP) shall be issued by the Engineer within ten (10) Days after receipt of the signed Agreement and after approval by the District of the contract bonds and insurance documents. The NTP authorizes the Contractor to proceed with the Work and establishes the First Chargeable Day of the Contract.

5.03. Commencement of Work

- A. The First Chargeable Day as specified in the NTP will be at least ten (10) Days after the date of said Notice.
- B. The Contractor shall provide written notice to the Engineer, at least 2 working days in advance, of the date the Contractor intends to start work on site.

5.04. Professional Scheduler

- A. All Detailed Progress Schedules shall be prepared and updated throughout the Contract Time(s) by a Schedule Professional who has, at a minimum, five (5) years of recent, verifiable experience in preparing, updating, and maintaining computerized Critical Path Method (CPM) construction schedules using Oracle Primavera, Microsoft Project, or similar scheduling software on at least two (2) completed construction projects of a similar size and degree of complexity as this Project.
- B. Prior to the Contractor's submission of the initial Detailed Progress Schedule, the Contractor shall submit and receive a favorable review of the résumé and professional references of the proposed Scheduler. The references shall be from at least two (2) project owners or construction managers familiar with the Scheduler's work on projects identified in the Scheduler's résumé. The District reserves the right to reject the proposed Scheduler based on lack of qualifications as defined in this Article.

5.05. Progress Schedules

- A. The Contractor is responsible for scheduling the sequence of its Work in all Progress Schedule(s) as described below.

5.05.01. Preliminary Progress Schedule

- A. Within ten (10) Days of the First Chargeable Day of the Contract as specified in the NTP, the Contractor shall submit to the Engineer a Preliminary Progress Schedule. This schedule shall include all activities that are planned to occur within the first 45 Days of the Contract.

5.05.02. Baseline Progress Schedule

- A. Within 30 Days of the First Chargeable Day of the Contract as specified in the NTP, the Contractor shall submit its initial Detailed Progress Schedule, which, if accepted, shall become the Baseline Progress Schedule for the Project. The submittal shall be in hard copy and native electronic format and shall fully conform to the numbered items below:
 - 1. The schedule shall be prepared using Oracle Primavera, Microsoft Project or similar Precedence Diagramming Method (PDM) scheduling software.
 - 2. The Baseline Progress Schedule shall be a Critical Path Method (CPM) schedule that is comprehensive, credible, well-constructed, and controlled. The schedule shall include input from its major Subcontractors and Suppliers and represent the complete scope of work. It shall represent the planned order of significant activities to complete the Work within the time allowed under this Contract. Any Detailed Progress Schedules shall be presented in sufficient detail such that sequence and interdependence of activities of the Project can be identified. The schedule shall include proper logic and adequate activity durations and show a logical critical path and Controlling Items of Work.
 - 3. The schedule shall account for on-site and off-site activities, including, but not limited to, permits, mobilization, and submittals (prepare and submit, review and approve, revise and resubmit); fabrication and delivery, installation, construction, system shutdowns, testing and start-up; training of District personnel; deficiency list; closeout; and demobilization. The schedule shall include key Milestones; reviews by the District, regulatory agencies, and other third parties of the Work; construction and sequencing constraints as specified in these Specifications; construction Work by the District forces or other third parties that interface with the Work; District-managed activities, such as the District furnishing Equipment; removal or relocation of interfering utilities by third parties; delivery of operation and maintenance manuals; and adequate time for Work completion and closeout activities.

4. Activity calendars shall reflect the planning basis and any Contract restrictions. All non-work Days and work hours shall be explained for each calendar.
5. The schedule shall reflect any limitations on work hours required by the Contract and any permit restrictions and conditions that are required.
6. Each schedule activity shall include a unique ID number and description, pertinent predecessors and successors, start/finish dates, an assigned workday calendar, a duration, percent complete, calculated float and activity codes to group the Work into Work Breakdown Structure (WBS) categories, location, responsibility, trade, and other rational groupings to facilitate sorting and filtering of the schedule activities.
7. Activities making up the critical path for the entire Contract and the critical path for each specific designated portion of the Work shall be identified. The network diagram shall be organized to indicate a continuous flow of progress of activities from left to right.
8. Except for concrete curing, submittal review, Equipment fabrication and deliveries, schedule activities shall be no longer than 20 working days. Activities longer than 20 working Days shall be subdivided into sub elements of work.
9. The Contractor shall submit a tabular listing of the schedule along with the network diagram.
10. The use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to District-caused delay); special lead/lag logic restraints; zero-total or free-float constraints; extended activity times; or imposing constraint dates other than required by this Contract shall be cause for rejection of the schedule using such techniques. The use of Resource Leveling (or similar software features) for the purpose of artificially adjusting activity durations to consume float and influence the critical path shall also be cause for rejection.
11. The Engineer's favorable review of the schedule shall not relieve the Contractor of errors and omissions in tasks, durations, or logic. No time extensions shall be granted because of errors or omissions on the schedule. It is the Contractor's responsibility to incorporate all necessary activities to cover the entire Work scope.
12. A favorably reviewed Baseline Progress Schedule is a condition precedent to payment.

B. Cost Loading

1. Work activities other than third-party and District-managed activities shall be cost loaded. No activity shall have a value greater than \$50,000 except for activities representing major Equipment purchases or installation. Progress Schedules exhibiting front-loaded costs are unacceptable. The Contractor shall revise the Schedule of Values (SOV) pursuant to Article 6.01. Schedule of Values until accepted by the Engineer.
2. The Contractor shall create two (2) hierarchical schedule activity codes in the scheduling software: (i) Bid Item and (ii) SOV. Each code shall have line item name corresponding to the accepted Bid items and SOV titles. Costs shall progressively roll up from the activity level to the SOV level; SOV codes shall roll up to the Bid Item level.
3. Each cost-loaded schedule activity shall be assigned one of the SOV codes. An activity shall not contain work assigned to more than one SOV code. The SOV code will be used to summarize cost-loaded activity values to produce the required SOV submittal. Table 6-1, referenced in Article 6.01.02. Submittal, is an acceptable form for this submittal. The SOV submittal shall be produced from the Progress Schedule software.
4. The sum of the monetary values of the activities assigned to each SOV code shall be equal to the accepted amount of that SOV line item. The sum of all the cost-loaded activities in the latest accepted schedule update shall total the latest approved Contract amount.

C. Early Completion Schedule

1. The District is not required to accept an earlier (advanced) schedule (i.e., one that shows early completion date[s] but within the specified Contract Time[s]). Time(s) for completion of Work shall adhere to the Contract Time(s) specified in these Specifications unless earlier time(s) of completion is requested by the Contractor and agreed to by the District. Any such agreement shall be formalized by a Change Order or by a DCO.
2. If the Contractor submits any Baseline Progress Schedule or Detailed Progress Schedules showing any Contract Time(s) earlier than a corresponding, specified Contract Time(s) and that early completion date is not agreed to by both parties through a Change Order or through a DCO, the duration from such early completion date and from the specified Contract Time(s) is considered "float" and shall belong to the Project.
3. Accordingly, the Contractor in this situation is to show in the Baseline Progress Schedule or in the Detailed Progress Schedules a specific activity identified as Project Completion Float, which may be adjusted as that float is used or increased. The Contractor shall not be entitled to a

time extension due to any cause or reason that consumes Project Completion Float.

5.05.03. Revised Baseline Schedules

- A. If the Contractor desires to make a change to the Baseline Progress Schedule after commencing construction, a revised Baseline Progress Schedule and associated narrative shall be submitted to the District at least 15 Days prior to any such change.
- B. The narrative shall state the reasons for the change; any change to the Baseline Progress Schedule shall be discussed in the submittal to the District.
- C. A revised Baseline Progress Schedule shall not become effective until accepted by the District.

5.05.04. Updates to the Detailed Progress Schedules

- A. Any and all updates or revisions to the initial Detailed Progress Schedule shall conform to the same requirements as the Baseline Schedule in Article 5.05.02. Baseline Progress Schedule.
- B. The Contractor shall submit an update of the prior month's Detailed Progress Schedule to the Engineer before the twenty-fifth Day of each month.
- C. Each schedule update shall incorporate all current information, including progress. Actual start and finish dates shall be updated and shall match daily reports. Work completed shall be shown with actual start and finish dates for each activity. Work in progress shall be shown with the actual start date and the percentage of Work completed as of the last date of the previous month.
- D. The Contractor shall also submit a narrative report that shall include a description of problem areas, state the reasons for any changes made to the schedule activities, current and anticipated delaying factors and their impact, and an explanation of corrective actions taken or proposed.
- E. Progress status shall be evaluated on the basis of float on the critical path at the time of updating, with negative float indicating the Project is behind schedule and positive float indicating ahead-of-schedule status.
- F. Acceptance of the Detailed Progress Schedule updates is a condition precedent to payment.
- G. Recovery Schedules
 - 1. At any time that construction progress lags behind any Baseline Progress Schedule or any updated/revised Detailed Progress Schedule accepted by the Engineer by either ten (10) working days or by five (5) percent of the remaining time to complete the Contract, whichever is less, the

Contractor shall prepare and submit a Recovery Schedule to the Engineer. This Recovery Schedule shall demonstrate how construction will be expedited and executed to achieve the contractual completion dates (either Milestone Completion or Project Completion dates).

2. Activity ID numbers shall be the same as in the most current and accepted and updated Detailed Progress Schedule. ID numbers of deleted activities shall not be reused on the Recovery Schedule. New ID numbers (not used in the most current and accepted Detailed Progress Schedule) shall be used for new activities.
3. A revised narrative describing the remaining Work as reflected in the Recovery Schedule shall be included and shall include a separate listing of all activities deleted, changed, or added with an explanation for each change.
4. Once favorably reviewed by the Engineer, the Recovery Schedule shall become the current, revised Detailed Progress Schedule against which future progress is to be measured.

5.05.05 Time Impact Analysis

- A. If the Contractor foresees that an Excusable Delay, as defined, will impact a Controlling Item of Work, a written request for adjustment of the impacted Contract Time(s) and supporting data shall be promptly submitted to the Engineer in accordance with Article 3.08. Change in Contract Time(s). To substantiate the Contractor's request, the supporting data shall include a Time Impact Analysis (TIA) based on the updated and accepted Detailed Progress Schedule for the month preceding the Excusable Delay.
- B. The TIA shall represent Excusable Delays as separate activities or as groups of activities. These activities shall be entered into the relevant part of the schedule update that was accepted just prior to the time the Excusable Delay occurred. In case of a deductive change reducing the quantity of Work, activities representing the deleted scope shall be dissolved or its estimated duration adjusted to reflect the reduction.
- C. The Contractor shall submit a written report with the TIA describing the Excusable Delay by the occurrence and the impact of the event time computation on all affected activities.
- D. Only changes or delays that affect or create Controlling Items of Work as defined by the schedule shall result in time adjustments. The Engineer shall determine if a request for time extension is warranted.
- E. Total float or slack is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date of any activity in the schedule. Total float or slack is not for the exclusive use or benefit

of either the District or the Contractor. It is an expiring resource available to either party on a first-come, first-served basis.

5.05.06. "Three-Week-Look-Ahead" Schedules

- A. The Contractor shall provide Three-Week-Look-Ahead Schedules on a weekly basis and present them at the weekly progress meetings.
- B. The Three-Week-Look-Ahead Schedules shall be prepared in the form of a bar chart breaking down activities into detailed subtasks on the Contractor's Detailed Progress Schedules. Subtasks shall identify related activities on the Detailed Progress Schedules and responsibility for completion of the sub task.
- C. The Contractor shall notify the Engineer in writing of any deviation from the current Three-Week-Look-Ahead Schedule within 24 hours of identification of said deviation.
- D. The Three-Week-Look-Ahead Schedules shall indicate inspections by the Engineer or by regulatory agencies and construction Work by the District forces or by other third parties that interface with the Work.

5.05.07. Payment

- A. Contractor shall submit a Baseline Progress Schedule, detailed monthly Progress Schedule updates, and Recovery Schedules to the District. The schedules shall be favorably reviewed by the District before a pending payment request is approved.
- B. Full compensation for furnishing, updating, revising, and submitting Detailed Progress Schedules and associated reports shall be considered as included in various Contract items of work; no additional payment shall be made.
- C. Submittal and favorable review of Detailed Progress Schedules and their components that meet the requirements of Article 5.05. Progress Schedules in this Section is a condition precedent to making a payment request.

5.06. Temporary Suspension of Work

- A. By written order to the Contractor, the Engineer may suspend the Work, wholly or in part, for an indefinite period or for such period as the Engineer may deem necessary, for any of the following reasons:
 - 1. Weather conditions or other conditions that are unfavorable for the proper prosecution of the Work.
 - 2. Failure of the Contractor to carry out orders given or to perform any provisions of the Contract.
 - 3. For the convenience and benefit of the District.

- B. Such suspension shall be effective upon receipt by the Contractor of the written order suspending the Work and shall be terminated upon receipt by the Contractor of the written order terminating the suspension.
- C. If the Engineer orders a suspension of all or of a portion of the Work that is on a critical path, pursuant to A.1 or A.3 in this Article, this shall be cause for a time extension if it impacts Milestone completion.

5.07. Liquidated Damages

- A. If the Work is not finished or completed by the Milestone dates in the Contract, it is agreed that damage shall be sustained by the District and that it is and shall be impracticable and extremely difficult to ascertain and determine actual damage that the District will sustain. It is agreed that the Contractor shall pay to the District the sum(s) set forth in the Special Provisions. Liquidated Damages shall be assessed separately and independently.
- B. The Contractor agrees to pay Liquidated Damages herein provided for, and further agrees that the District may deduct the amount thereof from any moneys due, or that may become due, to the Contractor under the Contract. Imposition of Liquidated Damages shall not preclude the District from taking other action as deemed appropriate to ensure performance of the Contract and shall not relieve the Contractor of its responsibility to comply with these Specifications.

SECTION 6. MEASUREMENT AND PAYMENT

6.01. Schedule of Values

6.01.01. Preparation

- A. The Contractor shall develop the Schedule of Values (SOV) in the Baseline Progress Schedule.
- B. Progress payments shall not be made until the SOV has received a favorable review by the Engineer.
- C. Each schedule activity representing a component of lump-sum Bid items shall include a directly proportional amount of the Contractor's overhead and profit. The Contractor's overhead and profit shall be completely distributed among all schedule activities. The Contractor shall provide additional cost documentation to the Engineer when requested so that values can be verified.
- D. The Contractor shall list and maintain separately on the SOV and on any Detailed Progress Schedule all values for items of Equipment that will be submitted for on-site Material payment. These Material items shall not be "progressed" as a part of the physical progress assessment.
- E. The Contractor shall prepare a Cash Flow Summary and a corresponding Cash Flow "S" Curve indicating the total dollar amount of Work planned for each month of the Project and shall equate the sum of monthly amounts to the Total Bid Price.

6.01.02. Submittal

- A. The Contractor shall submit to the Engineer the detailed SOV that conforms to Table 6-1 as part of its Baseline Progress Schedule and Detailed Progress Schedule Update submittals.
- B. The SOV submittals shall include a Cash Flow Summary and a Cash Flow "S" Curve.

6.01.03. Revision

- A. All construction Change Order authorizations shall be added to updated and revised Detailed Progress Schedules as cost-loaded activities and shall be coded to appropriate SOV line items. Additional cost documentation shall be provided to the Engineer when requested.
- B. The Contractor shall not change the final approved SOV without the approval of the Engineer. The SOV has a one-to-one direct relationship to the list of activities on the Contractor's Progress Schedule. Additions or deletions of activities on the Contractor's Detailed Progress Schedules shall require line item additions or deletions in the SOV. Any revision to the SOV shall be submitted with the monthly Detailed Progress Schedule updates.

6.02. Application for Payment

- A. Applications for payment shall be based upon actual progress as measured on the accepted Detailed Progress Schedules and as in the SOV.

6.02.01. Preparation

- A. Measurement of Quantities and Percent Complete
 - 1. All Work, except Work based on Time and Materials, shall be paid for at the Contract Price(s) per unit of measurement and shall be measured by the Engineer in accordance with the English system of measurement. Unless otherwise specifically provided, the Engineer shall compute quantities by a method that, in the Engineer's opinion, is best suited to obtain an accurate determination. The weights of metalwork, pipe, and other metal parts to be paid for on the basis of weight shall be determined by the Engineer. The District will not provide scales for weighing Material. The Engineer shall determine the weight of each part or item in the most practicable manner and shall use for that purpose manufacturer weights, or in their absence, catalog weights or estimated weights, in that order; weights of nonmetallic coatings shall be excluded.
 - 2. Progress payments shall be based on percent complete for each applicable cost-loaded schedule activity as determined by visual observation of the Project by the Contractor and by the Engineer on a monthly basis. The schedule activity shall be updated to reflect percent complete. The schedule shall roll up activities to an activity code for each SOV and for each Bid Item.
- B. Inclusion of Material On-Site
 - 1. Partial payments may be made by the District to the Contractor for Material and Equipment furnished and delivered to the Project site but not yet incorporated into the Work, at the District's sole discretion, and only if the Material and/or Equipment meet all of the following requirements:
 - a. Material and/or Equipment are fabricated and/or are manufactured goods or Equipment relatively unique to the Project.
 - b. The Contractor can transfer clear title to the District.
 - c. If the Contractor does not have Builder's Risk coverage, the Contractor shall, at no additional cost to the District, (i) insure the Material against theft, fire, loss, vandalism, and malicious mischief; (ii) name the District as additional insured; (iii) deliver this policy or certificate of this insurance to the District; and (iv) receive the District's acceptance of the policy or certificate of insurance. Insurance shall not be cancelable for at least 30 Days;

cancellation shall not be effective until certificate thereof is given to the District.

- d. Submittals for the Material and/or Equipment have been favorably reviewed by the District.
 - e. The Material and/or Equipment have been delivered, identified as property of the District, and physically separated from other Material; protected, properly stored, and maintained at the site in accordance with manufacturer requirements.
- 2. Only the Contractor's actual cost for Material may be paid prior to inclusion in the Work. The Contractor's actual cost for the Material must be supported by Supplier invoices, proof of payment by the Contractor, and other supporting documentation warranting that the Contractor has received and owns the Material or Equipment free and clear of all liens, charges, security interests, and encumbrances.
 - 3. Material delivered to the site fewer than 30 Days prior to their scheduled incorporation shall not qualify for partial payment consideration.
 - 4. Temporary construction material (e.g. shoring) do not qualify for partial payment.
 - 5. Final payment shall be made only for Material or Equipment incorporated into the Work. Upon Acceptance of the Work, all Material remaining for which advance payments had been made shall revert to the Contractor, unless otherwise agreed; partial payments made for these items shall be deducted from the final payment for the Work.
 - 6. Payment for Material on-site does not relieve the Contractor of its obligations pursuant to the Contract.

6.02.02. Submittal of Application for Payment

- A. On the 25th of each month, the Contractor shall prepare and submit the Application for Payment to the District. Each progress pay request is to include payment for Work completed up to and including the 25th of the month. The basis for partial payments of lump sum or other unit Contract items shall be determined by agreement between the Engineer and the Contractor.
- B. Each Application for Payment shall be transmitted under the signature of the responsible authorized representative of the Contractor.
- C. The Contractor's properly submitted Application for Payment request and request for final payment shall include the following substantiating data:
 - 1. Cover letter identifying:

- a. the Project name and Project number;
 - b. application number and date; and
 - c. a detailed list of enclosures.
2. Contractor monthly Progress Pay Estimate summary sheet.
 - a. The pay request submitted by the Contractor shall contain a source document that provides backup information on how the estimate was prepared.
 - b. A source document is defined as the basic document used to record or calculate quantities.
 - c. The source document must contain the appropriate Contract Bid Item, the location of the installation, the necessary measurement and/or calculations, and the name of the person preparing the document.
3. Request for payment that meets the criteria listed in 6.02.01.B. Inclusion of Materials On-site.
 - a. This form requires a description of each specific Material, quantity, value, and submittal review status substantiating evidence of purchase and cost and a completed affidavit.
4. Certified weekly payroll(s) for the pay estimate period in accordance with the Contract Prevailing Wage requirements.
5. Small/Micro Business Enterprise Utilization Report, if required.
6. Favorably reviewed Detailed Progress Schedule update with Cash Flow Summary and Cash Flow "S" Curve.
7. Daily Extra Work Report Form signed by both the District inspector and by the Contractor's representative, if applicable.
8. Satisfactory evidence that the Engineer has approved the action taken to correct any Noncompliance Notices and a numbered copy of the noncompliance log.
9. Written acknowledgement by the Engineer that the as-built Drawings have been updated that month.

6.02.03. Review of Application for Payment

- A. Upon receipt of a payment request, the District shall review the payment request for the purpose of determining that the payment request is a proper payment request. Any payment request determined not to be a proper payment request

suitable for payment shall be returned to the Contractor no later than seven (7) Days after receipt. A payment request returned pursuant to this paragraph shall be accompanied by a letter citing reasons why the payment request is not proper. The following are examples of an improper payment request:

1. The item of Work requested to be paid was not performed.
2. The Work being requested to be paid has already been paid in previous Progress Pay Estimates.
3. The Work performed and requested to be paid was not done in accordance with the Contract (noncompliance).
4. The quality of the finished product is unacceptable.
5. The source documentation is inaccurate.
6. The Daily Extra Work Reports are not properly filled out.
7. There is a failure to submit an approved SBE Utilization Report, if required.
8. There is a failure to submit any of the Substantiating Documentation in Article 6.02.02. Submittal of Application for Payment.

6.02.04. Payment

- A. Payment for all items of Work at the unit or lump-sum price shall be considered as full compensation for furnishing all labor, Material, tools, Equipment, and incidentals necessary to complete the item of Work; no additional payment shall be made. Payment for items of Work called for in the Specifications or shown on the Drawings but that are not separately identified in the Proposal Form shall be compensated as part of the Bid price of one or more of the items that are listed; no additional payment shall be made.
- B. Non-Waiver: No progress payment made to the Contractor or the Contractor's sureties shall constitute a waiver of the right to assess Liquidated Damages pursuant to the Contract Documents.
- C. The District shall pay within 30 Days valid, undisputed amounts, less any retention, withholds required by law or allowed by this Contract.
- D. If the District fails to make any progress payment within 30 Days after receipt of an undisputed and properly submitted payment request from the Contractor, the District shall pay interest to the Contractor equivalent to the legal rate set forth in the Code of Civil Procedure, Section 685.010, subdivision (a).

- E. The number of Days available to the District to make a payment without incurring interest pursuant to this Section shall be reduced by the number of Days by which the District exceeds the seven (7)-day return requirement set forth in Article 6.02.03. Review of Application for Payment, paragraph A.
- F. Unless otherwise indicated in the Special Provisions, the District shall retain five (5) percent of the estimated value of Work done and five (5) percent of the value of the Material so estimated to have been furnished and delivered and unused as aforesaid and shall pay to the Contractor, while carrying on the Work, the balance not retained as aforesaid after deducting there from all previous payments and all sums to be kept or retained under the provisions of the Contract. No estimate or payment shall be required to be made when, in the judgment of the Engineer, the Work is not proceeding in accordance with the provisions of the Contract, or when, in the Engineer's judgment, the total value of the Work done since the last estimate amounts to less than \$1,000. No estimate or payment shall be considered to be acceptance of the Work. All progress estimates and payments shall be subject to correction in the final estimate.
- G. Escrow in Lieu of Retention
 - 1. At the request of the Contractor, the District shall permit the substitution of securities or certificates of deposit equivalent to the amount of any monies withheld by the District as above provided. The deposit shall, in that event, be with the District or with a State- or Federal-chartered bank in California as the escrow agent.
 - 2. Alternatively, upon written request of the Contractor, the District shall make payments of the retention as it is earned directly to the escrow agent.
 - 3. The Contractor shall bear the expense of the District and of the escrow agent in connection with the escrow deposit made.
 - 4. Securities or certificates of deposit to be placed in escrow shall include those listed in Government Code Section 16430, bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and by the District. Unless otherwise permitted by the escrow agreement, securities or certificates of deposit to be placed in escrow shall be of a value at least equivalent to the amounts of retention to be paid to the Contractor pursuant to this Section.
 - 5. When the District makes payment of retentions directly to the escrow agent, the Contractor may direct, subject to approval of the District, the investment of the payments into securities.
 - 6. The Contractor shall enter into an escrow agreement satisfactory to the District; this agreement shall be substantially similar to that specified in Public Contract Code Section 22300.

7. The Contractor shall obtain the written consent of the surety to the agreement.

6.02.05. Withholding from Payments

- A. The District may, at its option and at any time, withhold progress payment(s) or retain from any amounts due the Contractor sums sufficient to cover for one (1) or more of the following reasons:
 1. Stop-Payment Notice Claims filed pursuant to the Civil and Labor Code.
 2. Contractor has failed to comply with State law prompt payment requirements with regard to payments to Subcontractors.
 3. Third-party claims have been filed or there is reasonable evidence indicating probable filing of these claims.
 4. Liquidated Damages due or expected.
 5. The Contract sum has been reduced by Change Orders.
 6. Damage has occurred to the District or to another Contractor.
 7. The Engineer determines that:
 - a. the Work cannot be completed for the unpaid balance of the Contract sum;
 - b. if any Contractor's Detailed Progress Schedule forecasts inexcusable late completion, or if the District determines that the Work will not be completed within the Contract Time(s), and that the current unpaid balance and retention will not be adequate to cover actual or Liquidated Damages for the anticipated Delay;
 - c. the Contractor persistently fails to perform the Work in accordance with the Contract Documents;
 - d. the Contractor fails to submit timely Change Order cost proposal breakdowns and documentation in accordance with the Contract Documents;
 - e. the Contractor fails to timely submit the Preliminary Progress Schedules, or Detailed Progress Schedules, or any updates or revisions to those submittals, and reports in accordance with the Contract Documents;
 - f. the Contractor fails to maintain detailed, timely, updated as-built documents or closeout items.

- g. the Contractor fails to submit certified payroll records in accordance with the Contract Documents and prevailing wage requirements;
- h. the Contractor has not submitted an approved SBE utilization report;
- i. the Contractor fails to submit a proper payment request in accordance with the Contract Documents;
- j. the Contractor fails to comply with the submittal requirements requiring rereview of the submittal;
- k. the Contractor fails to submit a fully compliant Quality Control Plan;
- l. there has been material noncompliance with the insurance requirements; or
- m. the Contractor fails to comply with any other requirements of the Contract Documents.

6.03. Final Payment

- A. As soon as practicable after completion of the Work, the Engineer shall prepare in writing and furnish to the Contractor the final estimate of the quantities of Work done and all payments due as part of the Contract; this estimate will show deductions for prior payments and any other amounts to be retained or withheld as part of the Contract. The amount determined due, less the amount retained and/or withheld, shall be paid.
- B. The retained amount will not be due or payable until 35 Days after the filing of the Notice of Completion of Contract and Acceptance of Work, subject to any withholds required by law or by the Contract.
- C. Prior to release of the retained amount, the Contractor shall furnish the District with a release of all Claims by the Contractor against the District arising by virtue of this Contract. The release of Claims may include disputed Contract Claims in stated amounts as the Contractor may specifically exclude from the operation of the release pursuant to acceptance of Final Payment.

Measurement and Payment

Section 6

Tesla Update 1 received 6/23/09			Schedule of Values Detail - Chris Saldon				07-Jul-09 13:19		
Cost Account ID#	Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	Budgeted Total Cost	Actual Total Cost	Cost % Complete
Total			609.5d	21-Oct-08 A	16-Dec-11	139.5d	\$51,420,562.00	\$15,666,462.65	30.61%
1.A.1.1			17.0d	10-Nov-08 A	10-Dec-08 A		\$1,120,000.00	\$1,120,000.00	100%
1.A.1.1	P101040130	30% DESIGN	15.0d	10-Nov-08 A	10-Dec-08 A		\$1,120,000.00	\$1,120,000.00	100%
1.A.1.2			30.0d	11-Dec-08 A	23-Feb-09 A		\$2,140,000.00	\$2,140,000.00	100%
1.A.1.2	P101040150	60% DESIGN	30.0d	11-Dec-08 A	23-Feb-09 A		\$2,140,000.00	\$2,140,000.00	100%
1.A.1.3			87.1d	11-Dec-08 A	28-May-09 A		\$1,240,000.00	\$678,500.00	70.85%
1.A.1.3	P101040180	SITE CIVIL DESIGN 90%	30.0d	11-Dec-08 A	23-Feb-09 A		\$0.00	\$0.00	0%
1.A.1.3	P101040190	ARCHITECTURAL 90%	30.0d	11-Dec-08 A	23-Feb-09 A		\$0.00	\$0.00	0%
1.A.1.3	P101040250	90% DESIGN	48.0d	24-Feb-09 A	28-May-09 A		\$1,240,000.00	\$678,500.00	70.85%
1.A.1.4			30.0d	10-Nov-08 A	19-Dec-08 A		\$100,000.00	\$82,190.23	82.19%
1.A.1.4	P101040100	ON-SITE GEOTECHNICAL INVESTIG...	28.0d	10-Nov-08 A	19-Dec-08 A		\$100,000.00	\$82,190.23	82.19%
1.A.1.5			17.0d	10-Nov-08 A	28-Nov-08 A		\$25,000.00	\$25,000.00	100%
1.A.1.5	P101040110	POTHOLE RESULTS & SITE SURVE...	15.0d	10-Nov-08 A	28-Nov-08 A		\$25,000.00	\$25,000.00	100%
1.A.2.1			83.0d	01-Jun-09	26-Aug-09	253.0d	\$2,624,000.00	\$0.00	0%
1.A.2.1	2A01040100	100% DESIGN	35.0d	01-Jun-09	20-Jul-09	48.0d	\$2,500,000.00	\$0.00	0%
1.A.2.1	2A01040120	ADDRESS REVIEW COMMENTS & ...	5.0d	20-Aug-09	26-Aug-09	244.0d	\$324,000.00	\$0.00	0%
1.B.1.1			326.0d	21-Oct-08 A	30-Nov-09	9.0d	\$2,217,000.00	\$2,155,000.00	49.3%
1.B.1.1	SU02574100	SUBMIT STEEL PIPE & FABRICATE...	0.0d	21-Oct-08 A			\$1,000.00	\$1,000.00	0.05%
1.B.1.1	SU02574110	SUBMIT STEEL PIPE FABRICATION...	5.0d	03-Dec-08 A	17-Dec-08 A		\$1,000.00	\$972.00	97.2%
1.B.1.1	PR02574100	PROCURE 144" & 84" HEADERS (S...	115.0d	06-Nov-08 A	18-Jun-09	10.0d	\$959,481.00	\$932,596.09	97.2%
1.B.1.1	PR02574110	PROCURE 120" & 144" PIPE (S.D. - ...	149.0d	06-Nov-08 A	29-Sep-09	4.0d	\$491,874.00	\$477,907.13	97.2%
1.B.1.1	PR02574120	PROCURE INLET & OUTLET TIE-IN...	231.0d	06-Nov-08 A	30-Nov-09	9.0d	\$296,578.00	\$288,245.78	97.19%
1.B.1.1	PR02574130	PROCURE 48" BRANCH PIPING (S...	110.0d	06-Nov-08 A	18-Jun-09	38.0d	\$467,267.00	\$454,279.00	97.22%
1.B.1.10			0.0d	10-Nov-08 A	10-Nov-08 A		\$2,594,444.00	\$1,026,157.00	39.55%
1.B.1.10	P101040120	BONDS & INSURANCE	0.0d		10-Nov-08 A		\$2,594,444.00	\$1,026,157.00	39.55%
1.B.1.2			253.0d	03-Nov-08 A	30-Sep-09	8.5d	\$757,077.00	\$757,077.00	100%
1.B.1.2	SU15100100	SUBMIT 84" & 144" VALVES (S.D. - ...	5.0d	03-Nov-08 A	13-Nov-08 A		\$1,000.00	\$1,000.00	100%
1.B.1.2	PR15100100	PROCURE 84" VALVES (S.D. - REQ...	149.0d	08-Jan-09 A	29-Sep-09	4.0d	\$251,773.00	\$251,773.00	100%
1.B.1.2	PR15100110	PROCURE 144" VALVES (S.D. - RE...	185.0d	25-Nov-08 A	30-Sep-09	8.5d	\$504,304.00	\$504,304.00	100%
1.B.1.3			202.0d	10-Dec-08 A	15-Jan-10	0.8d	\$1,102,273.00	\$1,051,281.00	95.37%
1.B.1.3	SU15100110	SUBMIT DeZURIK VALVES (S.D. - R...	5.0d	10-Dec-08 A	15-Dec-08 A		\$1,000.00	\$1,000.00	100%
1.B.1.3	PR15100120	PROCURE 48" DeZURIK VALVES (S...	150.0d	02-Mar-09 A	15-Jan-10	-25.4d	\$550,836.00	\$525,308.74	95.4%
1.B.1.3	PR15100130	PROCURE 90", 78", 66" & 60" DeZUR...	158.0d	02-Mar-09 A	21-Aug-09	100.5d	\$550,837.00	\$524,974.28	95.34%
1.B.1.4			265.0d	13-Mar-09 A	05-Apr-10	87.0d	\$307,500.00	\$0.00	0%
1.B.1.4	SU11298100	SUBMIT CO2 SYSTEM	10.0d	13-Mar-09 A	08-Oct-09	65.0d	\$1,000.00	\$0.00	0%
1.B.1.4	PR11298100	PROCURE CO2 SYSTEM	110.0d	28-Oct-09	05-Apr-10	65.0d	\$306,500.00	\$0.00	0%
1.B.1.5			102.0d	29-Sep-09	18-Feb-10	44.5d	\$109,880.00	\$0.00	0%
1.B.1.5	SU11241100	SUBMIT CHEMICAL TANKS	5.0d	29-Sep-09	08-Oct-09	44.5d	\$1,000.00	\$0.00	0%
1.B.1.5	PR11241100	PROCURE CHEMICAL TANKS	80.0d	21-Oct-09	18-Feb-10	44.5d	\$108,880.00	\$0.00	0%
1.B.1.6			244.0d	01-Jun-09	06-May-10	49.0d	\$1,289,069.00	\$184,500.00	14.31%
1.B.1.6	SU16260100	SUBMIT EMERGENCY GENERATO...	5.0d	01-Jun-09	05-Jun-09	47.0d	\$1,000.00	\$1,000.00	100%
1.B.1.6	PR16260100	PROCURE EMERGENCY GENERAT...	220.0d	23-Jun-09	06-May-10	47.0d	\$1,288,069.00	\$183,500.00	14.25%
1.B.1.7			269.0d	23-Dec-08 A	15-Jan-10	-27.4d	\$75,805.00	\$75,805.00	100%
1.B.1.7	SU13420100	SUBMIT 48-IN MAG METERS (S.D. - ...	5.0d	23-Dec-08 A	28-Dec-08 A		\$1,000.00	\$1,000.00	100%
1.B.1.7	PR13420100	PROCURE 48-IN MAG METERS (S.D...	200.0d	19-Jan-09 A	15-Jan-10	-25.4d	\$74,805.00	\$74,805.00	100%
1.B.1.8			117.0d	11-Sep-09	23-Feb-10	53.5d	\$128,925.00	\$0.00	0%
1.B.1.8	SU11240100	SUBMIT CHEMICAL METERING PU...	5.0d	11-Sep-09	18-Sep-09	53.5d	\$1,000.00	\$0.00	0%
1.B.1.8	PR11240100	PROCURE CHEMICAL METERING P...	95.0d	05-Oct-09	23-Feb-10	53.5d	\$127,925.00	\$0.00	0%
1.B.1.9			143.0d	08-Aug-09	23-Feb-10	53.5d	\$15,750.00	\$0.00	0%
1.B.1.9	SU11247100	SUBMIT CHEMICAL TRANSFER PU...	5.0d	08-Aug-09	13-Aug-09	53.5d	\$1,000.00	\$0.00	0%
1.B.1.9	PR11247100	PROCURE CHEMICAL TRANSFER P...	120.0d	28-Aug-09	23-Feb-10	53.5d	\$14,750.00	\$0.00	0%
1.B.2.1.1			357.5d	21-Apr-09 A	03-Nov-10	38.5d	\$1,269,346.00	\$99,175.00	7.81%
1.B.2.1.1	SW02900100	PLANT TREES & TEMP IRR. SYSTEM	15.0d	08-Oct-10	27-Oct-10	34.5d	\$90,000.00	\$0.00	0%
1.B.2.1.1	SW02900110	HYDROSEED	4.0d	27-Oct-10	03-Nov-10	34.5d	\$16,000.00	\$0.00	0%
1.B.2.1.1	SW02200110	PREP ROAD SUBGRADE	10.0d	20-Jul-10	03-Aug-10	34.5d	\$155,000.00	\$0.00	0%
1.B.2.1.1	SW02500100	CONSTRUCT ROADS TO TOP OF S...	15.0d	17-Aug-10	08-Sep-10	54.5d	\$167,500.00	\$0.00	0%
1.B.2.1.1	SW02770100	CURBS & GUTTERS	15.0d	03-Aug-10	24-Aug-10	54.5d	\$87,448.00	\$0.00	0%
1.B.2.1.1	SW02510110	PAVE ROADS	10.0d	31-Aug-10	15-Sep-10	68.5d	\$161,331.75	\$0.00	0%
1.B.2.1.1	SW01900120	RELOCATE DSL LINE (S.D. - REQU...	15.0d	21-Apr-09 A	11-May-09 A		\$14,900.00	\$14,900.00	100%

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TASK filter: Cost Account Only.

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TABLE 6-1. SCHEDULE OF VALUES SAMPLE

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SECTION 7. SUBMITTAL MANAGEMENT

7.01. Submittal Requirements

- A. This Article includes requirements and procedures for preparing and submitting submittals and other information required by the Contract Documents.
- B. Drawings listed in the Specifications shall be supplemented by the Contractor with the submittals required throughout the Contract Documents for the prosecution of the Work and for approval of Equipment. Submittals may include shop detail Drawings, fabrication Drawings, falsework and formwork Drawings, pipe layouts, and similar classes of Drawings, calculations, specifications, product data, samples, manuals, spare parts, photographs, survey data, schedules, or similar items required to be submitted to the Engineer by the Contract Documents.
- C. These submittals shall be favorably reviewed by the Engineer before any Work involving these submittals is performed. No change shall be made by the Contractor to any submittal after it has been favorably reviewed by the Engineer.
- D. Submittals shall contain all required, detailed information at a reasonable scale with enough views to clearly show the Work to be done or the item to be furnished and shall be properly checked.

7.02. Master Submittal List

- A. Within 30 Days of the First Chargeable Day of the Contract as specified in the NTP and monthly thereafter, the Contractor shall submit an electronic copy of the Master Submittal List to the Engineer. This list shall be in Microsoft Excel spreadsheet format and shall identify all originally planned submittals. The purpose of this list is to assist in planning for submittal creation and review and to provide a monthly update of submittal review status. Items on this list shall be sorted by Specifications Number and shall include, at a minimum, the following information:
 - 1. Item number.
 - 2. Reference Specification Section number and paragraph.
 - 3. Description of submittal.
 - 4. Type of submittal (e.g., Shop Drawing, catalog, sample, certificate, test data, manual, other).
 - 5. Original preparer of the submittal to include preparer's name, firm name, telephone number, and email address.
 - 6. Estimated date for submission to the Engineer by the Contractor. Dates shall be coordinated with the Contractor's Progress Schedules to ensure sufficient time is allowed for processing submittals and for procurement of

Material prior to the start of a construction activity. The Contractor shall include submittals as activities in the Detailed Progress Schedules.

7. Actual date sent by the Contractor to the District.
 8. Actual date returned by the District to the Contractor.
 9. Submittal status.
- B. The Contractor shall identify in the master submittal list the submittals that may require long-lead times for manufacturing and/or for delivery and that must be submitted early to the Engineer for review.

7.03. Timing of Submittals

- A. The Contractor shall make submittals promptly in accordance with the accepted Detailed Progress Schedules and in such sequence as to cause no Delay in the Work. The time allowed by the Contractor for submittal review shall also provide sufficient time for disapproval and resubmission.
- B. The sequence of submission of submittals shall be such that all information is available to the Engineer for review of each submittal as it is received. The Contractor is responsible for furnishing submittals in sufficient time for approval action, including resubmittal, without delaying construction.

7.04. Submittal Format

- A. One (1) electronic copy and five (5) paper copies of each submittal shall be submitted.
- B. All submittals shall be clearly identified by reference to the Project name, Specification Section, Article, paragraph, Drawing number, or detail as applicable. Submittals shall be well organized, clear, and legible, and of sufficient size for clear presentation of the data. Data submitted shall describe the Materials, Equipment, or other items to be furnished, and where applicable, the system in sufficient detail to indicate full compliance with the requirements of these Contract Documents. Data shall consist of complete Materials and Equipment lists accompanied by catalog data sheets, cuts, performance curves, diagrams, or similar descriptive Materials. Materials and Equipment lists shall give, in each case, the name of the manufacturer, trade name, catalog reference, size, finish, and all other pertinent data.
- C. All submittals shall be in the English language and per the customary Imperial System units of measure and weight (i.e., feet, inches, pounds, degrees in Fahrenheit, etc.). Metric units may be provided in addition to the customary Imperial System units of measure and weight.
- D. All submittals and supporting data, catalogs, schedules, etc., shall be submitted as the instruments of the Contractor, who shall be responsible for their accuracy,

completeness, coordination, and conformance with the Contract Documents. These submittals may be prepared by the Contractor, Subcontractors, or Suppliers; the Contractor shall review and ascertain that submittals meet all of the requirements of the Contract Documents while conforming to structural, space, and access conditions at the point of installation prior to submission to the Engineer. Designation of Work "by others" if shown in submittals shall mean that the Work shall be the responsibility of the Contractor rather than of the Subcontractor or of the Supplier who prepared these submittals. The Contractor shall ensure that there is no conflict with other submittals. The Contractor shall ensure coordination of submittals among the related crafts and Subcontractors.

- E. If the submittals show any deviations from the Contract requirements, the Contractor shall include with the submittal a separate written description of such deviations and the reasons therefore. If any deviations from the Contract requirements are not clearly noted and prominently identified on the submittal, the review of the submittal shall not constitute acceptance of such deviations.
- F. The Contractor shall review all submittals before submitting them to the Engineer and shall certify on each transmittal letter and on each submittal that the submittal has been checked, is in compliance with the Contract Documents except as specifically noted, and that each deviation from the Contract Documents is specifically noted.
- G. Submittals shall include the following:
 - 1. A separate transmittal form shall be used for each specific item, class of Material, Equipment, and items specified in separate, discrete Specification Section or Article, for which a submittal is required. Submittal documents common to more than one (1) piece of Equipment shall be identified with all appropriate Equipment numbers. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or reviewing the group or package as a whole. The Specification Section or Article to which the submittal is related shall be indicated on the transmittal form.
 - 2. A sequential number in chronological order shall be assigned for each submittal and shall be noted on the transmittal form. Submittal numbers shall have the following format: XXX.Y, where XXX is the sequential number (001 to 999) assigned by the Contractor; and Y is the re-submittal number (0 to 9). For each item submitted, the Contractor shall include the applicable Specification number on the submittal and on the transmittal form.
 - 3. A separate written description of deviations from the Contract Documents, if any.
 - 4. The date of submission and the dates of any previous submissions.

5. The District's name and the Project title and number.
6. Contractor identification.
7. The names of the following (as applicable):
 - a. Subcontractor
 - b. Supplier
 - c. Manufacturer
8. Identification of the product with the Specification Section or Article number, page, and paragraph(s).
9. Field dimensions clearly identified as such.
10. Relation to adjacent or critical features of the Work or Material.
11. Applicable standards (e.g., ASTM).
12. Identification of revisions on resubmittals.

7.05. Submittals to be Furnished by the Contractor**A. Shop Drawings**

1. Shop Drawings include, but are not necessarily limited to, custom prepared data (e.g., fabrication on erection/installation [working] Drawings, scheduled information, setting diagrams, actual shop work manufacturing instructions, custom templates, special wiring diagrams, coordination Drawings, individual system or Equipment inspection and test reports), including performance curves and certifications, as applicable to the Work.
2. Submittal of shop Drawings by simply annotating copies of the Contract Drawings is subject to rejection.

B. Product Data

1. Product data as specified in the individual Section or Article, includes, but is not necessarily limited to, standard, prepared data for manufactured products (sometimes referred to as catalog data or "cuts"), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliance and applicability, roughing in diagrams and templates, product photographs, standard wiring diagrams, printed performance curves and operational range diagrams, production or quality control inspection and test reports and certifications, mill reports, product

operating and maintenance instructions, recommended spare parts listing, and printed product warranties, as applicable to the Work.

C. Samples

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

D. Concrete Reinforcement Submittals

1. Submittals for concrete reinforcement shall not simply be annotated copies of the Contract Drawings. New scale Drawings shall be prepared showing plans, all vertical structure elevations, sections, and details as required to clearly delineate the reinforcing to be furnished and installed. Submittals shall show and tabulate reinforcement dimensions, sizes, grades, shapes, splices, laps, splice locations, dowel lengths, and all similar information needed for construction, Material takeoffs, and Engineer's review to determine compliance with the structural design. Submittals shall show reinforcement dimensioning and placement that reflect the Contractor's intended and approved concrete placement sequence.

E. Electrical and Instrumentation Equipment Submittals

1. Submittals as described herein shall be provided for all electrical and instrumentation Equipment and systems furnished as part of products and systems specified in these Specifications. These submittals shall include, but are not necessarily limited to, the following:
 - a. An Equipment list tabulating all components furnished, followed by the manufacturer's name, manufacturer's model number, and a cross-reference to its location on the submittals.
 - b. A complete conduit riser diagram and conduit schedule shall be prepared and submitted for the interconnection of all electrically powered Equipment. The riser diagram and conduit schedule shall detail conduit identification numbers as shown on the Drawings, as well as size, wires, and location. Where the riser diagram requires either more wires or larger conduits than detailed in the Drawings, the Contractor shall coordinate any required changes with the electrical Subcontractor, if any, before installation begins.

- c. Interior and exterior panel elevation Drawings for all panels, consoles, and Equipment enclosures. The elevations shall be drawn to scale and shall detail all Equipment in or on the panel. Nameplates, conduit access locations, mounting provisions, panel construction details, manufacturer's model number, and panel color (or color samples) shall be included.
 - d. Drawings and descriptive data and brochures of each item of Equipment. Electrical characteristics and requirements, enclosure types, manufacturer, and model number shall be included. Sheets or Drawings showing more than the particular item under consideration shall have crossed out all but the description of the item for which the review is requested.
 - e. Schematics and connection diagrams. A manufacturer's standard connection diagram or schematic showing more than one (1) scheme of connection shall not be accepted unless it is clearly marked to show the intended, work specific connections; terminal numbers shall be included. A written operation theory shall be included for all complex control schemes.
2. For each instrument furnished with mechanical systems, submittals shall include an Instrumentation, Systems, and Automation Society (ISA) S20 Data Sheet and technical bulletins or brochures. The summary data sheets and the technical bulletins shall include, but shall not necessarily be limited to, the following:
- a. tag numbers per the Process and Instrumentation Drawings;
 - b. the manufacturer's model or other ordering designation;
 - c. product (item) names used on the Drawings;
 - d. physical location where installed;
 - e. input output characteristics;
 - f. range, size, and graduations as required;
 - g. physical size with dimensions and mounting details;
 - h. quantity and quality requirements for electric power, air, and/or water supply;
 - i. Materials in contact with or otherwise exposed to the process;
 - j. certified calibration and/or calibration curves where applicable; and

- k. Detailed Instrumentation, Systems, and Automation Society (ISA) loop wiring diagrams showing requirements for each instrument that is furnished under this Section. The diagram shall identify all device terminal points, as well as any intermediate terminal blocks. Power supplies, loop grounds, wire/cable number, etc., shall be detailed. Such loop wiring diagrams shall be prepared per ANSI/ISA S5.4. Optional items 1, 3, 4, 6, and 7 from paragraph 5.3 of S5.4 are also required. Note that the District loop numbering protocol used in these documents and required for submittals does not comply with ISA standards.
- 3. Submittal of motor data for acceptance shall include complete nameplate data in accordance with NEMA Standards and, in addition, the following information for motors typical of the units furnished:
 - a. Ambient temperature setting.
 - b. Service factor.
 - c. Efficiency at $\frac{1}{2}$, $\frac{3}{4}$, and full load.
 - d. Power factor at $\frac{1}{2}$, $\frac{3}{4}$, and full load.
 - e. Motor outline, dimensions, and weight.
 - f. Descriptive bulletins, including full description of insulation system.
 - g. Bearing design data.
 - h. Special features (i.e., space heaters, temperature detectors, etc.).

7.06. Submittal Review Procedures

- A. Review of submittals has as its primary objective the completion of the Work in full conformance with the Contract Documents, unmarred by field corrections and within the construction time provided. In addition to this primary objective, submittal review as a secondary objective shall assist the Contractor in its procurement of Equipment that shall meet all requirements of the Contract Documents; shall fit the structures detailed on the Drawings; shall be completed with respect to piping, electrical, and control connections; shall have the proper functional characteristics; and shall become an integral part of a complete operating facility.
- B. For submittals that require the Engineer's review, one (1) copy shall be returned to the Contractor within 20 Days after receipt. The Contractor shall make any necessary corrections and revisions to the returned submittals and shall resubmit the submittals within 20 Days after receipt. The Contractor is responsible for furnishing submittals in sufficient time for approval action, including re-submittal without delaying construction.

- C. The Contractor shall be solely responsible for agreement and conformity of submittals with the Contract Drawings and with the Specifications. The review of submittals shall be for general conformance with the design concept and with the Contract Documents. It is expressly understood that the Engineer's review of the Contractor's submittals shall not relieve the Contractor of any responsibility for:
1. accuracy of dimensions and details;
 2. coordinating the Work with all other associated Work and trades;
 3. selecting fabrication processes;
 4. techniques of assembly;
 5. departing from details furnished by the Engineer;
 6. its obligation to meet safety requirements;
 7. its obligation to meet all other requirements of laws;
 8. compliance with the Contract requirements; and
 9. errors, including details, dimensions, and Material.
- D. Favorable review of all submittals (returned "No Exceptions Noted" "In Receipt of" or "Make Corrections as Noted") shall apply in general design only and shall in no way relieve the Contractor of responsibility for errors or omissions contained therein. Favorable review shall not relieve the Contractor of its obligations to meet safety requirements and all other requirements of laws nor shall it constitute a Change Order authorization. Favorable review shall not constitute acceptance by the District of any responsibility for the accuracy, coordination, and completeness of the submittals or for the items of Equipment represented on the submittals, nor shall it constitute a Change Order authorization.
- E. If the Contractor submits an incomplete or disorganized submittal, the submittal shall be considered "Rejected" and shall be returned to the Contractor without review. The Engineer may, at its sole discretion, elect to provide a list of, or mark the submittal indicating some or all of, the areas that are incomplete. A complete submittal shall contain sufficient data to demonstrate that items comply with the Contract Documents; shall meet the minimum requirements for submissions cited in the Technical Specifications; and shall include any necessary revisions required for Equipment other than the first named manufacturer. The Engineer's determination of whether a submittal is complete shall be final. The District reserves the right to return a submittal that requires coordination with another or other submittals not yet received by the District.
- F. After review by the Engineer of each of the Contractor's submissions, the submittal shall be returned to the Contractor with actions defined as follows:

1. No Exceptions Noted: The favorable review of a submittal is subject to its compatibility with future submissions and with additional partial submissions for portions of the Work not covered in this submission. It does not constitute approval or deletion of specified or required items not shown in the partial submission. The Contractor may proceed with the Work shown in the submittal.
 2. Make Corrections As Noted: Same as 1 except that minor corrections as noted shall be made by the Contractor. The Contractor may proceed with the Work, providing corrections have been made; resubmission is not required.
 3. Revise and Resubmit: Rejected because of inconsistencies or errors that shall be resolved or corrected by the Contractor prior to subsequent resubmission. The Contractor may not proceed with the Work shown in the submittal.
 4. Rejected: Submitted Material does not conform to Drawings and Specifications in major respects (i.e., wrong size, model, capacity, or Material). The Contractor may not proceed with the Work shown in the submittal.
 5. In Receipt Of: Receipt of submittal is acknowledged by the Engineer.
- G. Resubmittals shall be processed in the same manner as first submittals. On resubmittals, the Contractor shall direct specific attention, in writing on the letter of transmittal and on resubmitted shop Drawings by use of revision triangles or other similar methods, to revisions from previous submissions. Any such revisions that are not clearly identified shall be made at the risk of the Contractor. If any such revisions are installed, all portions thereof that do not fully conform to the Contract Documents shall be corrected by the Contractor at its expense and as required by the Engineer.
- H. The favorable review of submittals (returned "No Exceptions Noted" or "Make Corrections as Noted") shall be obtained from the Engineer prior to the fabrication, delivery, and construction of items requiring submittals.
- I. All resubmittals shall be accompanied by a memorandum or letter from the Contractor that responds to each written review comment provided by the Engineer in the previous submittal. Each response shall describe the corrective action taken or reason for the Contractor's actions.
- J. The Contractor shall make a complete and acceptable submittal to the Engineer at least by the second submission. If a returned submittal is required to be resubmitted more than once due to the Contractor's failure to comply with submittal requirements, the Contractor may be charged all costs associated with rereview of the submittal. The charges may be deducted from a progress payment due, or that will become due, to the Contractor and shall be based on

actual review hours recorded by the Engineer, District staff, and by the Engineer's consultants, multiplied by their actual, fully burdened labor rates.

7.07. Substitutions

- A. Substitutions are considered changes to the Contract. If Materials, Equipment, item, means, method, technique, sequence, or procedure of construction is required by the Contract Documents, the Contractor may furnish or utilize a substitute item, means, method, sequence, technique, or procedure of construction acceptable to the Engineer, unless identified as a sole/single-source item. Substitutions shall be formally submitted as a Request for Substitution. The Contractor must submit sufficient information to allow the Engineer to determine whether the substitution proposed is equivalent to that indicated or as required by the Contract Documents.
- B. The Engineer shall respond in writing to the Contractor within ten (10) Days indicating the time necessary to evaluate each proposed substitution.
- C. The Engineer shall be the sole judge in this matter. In the event the Engineer rejects the proposed items, the Contractor shall submit the Specified Items.
- D. No substitution shall be ordered, installed, or utilized without the Engineer's prior written acceptance, which shall be evidenced by either a favorably reviewed Request for Substitution, Change Order, or by a DCO. The District may require the Contractor to furnish, at the Contractor's expense, a special performance guarantee with respect to any approved substitution.
- E. The Engineer shall record time required by the Engineer, District staff, and by the Engineer's consultants to evaluate substitutions proposed by the Contractor and to make changes in the Contract Documents occasioned thereby. Regardless of whether or not the Engineer accepts a proposed substitution, the Contractor shall reimburse the District for the charges of the Engineer and for the Engineer's consultants for evaluating each proposed substitution.
- F. Cost or time impacts to other items of Work that are caused by any Contractor-initiated Request for Substitution, whether anticipated or unforeseen, shall be the responsibility of the Contractor.
- G. Request for Substitution: Submission of items that are proposed as equivalent to any other item, means, method, sequence, technique, or procedure of construction shall be evaluated in accordance with the provisions outlined below. Burden of proof as to the submitted items being equivalent to the items required by the Contract Documents is the responsibility of the Contractor.
 - 1. All provisions and evaluation criteria under Article 7.08. "Or Equal" Items, paragraph E in this Article shall apply to the proposed substitutions.
 - 2. No submission of proposed substitutions shall be accepted or considered by the Engineer prior to Contract award.

3. Other additional provisions and/or criteria as deemed necessary by the Engineer.
4. Substitution(s) of Specified Item(s) item, means, method, sequence, technique, or procedure of construction proposed by the Contractor may require modifications in the Project design, Project schedule, and/or in the construction sequencing. The Contractor shall identify all necessary Project modifications required for the substitution(s). Necessary Project modifications may include, but may not be limited to, electrical, instrumentation, structural, mechanical, architectural, testing, engineering costs, and other related modifications.
5. The Contractor shall be responsible for all costs associated with the substitution(s), including submittal reviews and any Project redesign and modification. Contractor refusal to accept any of these costs shall be just cause for disapproval of the substitution(s).
6. If the proposed items are accepted, 50 percent of all savings shall be credited to the District. Total cost savings shall be less any design costs required for substitution(s) implementation.

7.08. "Or Equal" Items

- A. Specified Item: Materials, Equipment, product, thing, or service referenced in the Contract Documents that has been identified by one (1) or more specific brand, manufacturer, Supplier, company, catalog number, or trade name. Whenever such designations shall be deemed to be used for the purpose of facilitating the description of the Specified Item and shall be deemed to be followed by the words "Or Approved Equal," whether explicitly stated or not, unless specifically noted to the contrary, in these instances, the Contractor may presume the specific brands are the only product known to the District that meet the requirements of the Contract Documents; the Contractor may propose the provision of Materials or Equipment that are equal to the Specified Item.
- B. Equal Item: Item as referenced in these Contract Documents are those that, to the Engineer's knowledge, meet the requirements of the Contract Documents and are considered equal to the Specified Items.
- C. The Contractor shall submit sufficient data, Drawings, samples, literature, calculations, and all other information as requested by the District to demonstrate to the Engineer that the proposed items are equal to the Specified Items.
- D. Failure of the Contractor to submit the proposed Equal Item for review in the manner and time described in this Article shall be sufficient cause for rejection by the Engineer of the proposed Equal Item.
- E. The Engineer's evaluation of the submitted items proposed as being equivalent to the Specified Items is based on, but is not limited to, the following:
 1. Performance.

2. Functionality and efficiency.
 3. Durability.
 4. Life cycle costs.
 5. Ease and economy of maintenance and operation.
 6. Construction and physical characteristics as compared to the Specified Items or as delineated in the Contract Documents.
 7. Dimensional compatibility with the Material it combined to produce a unified design system.
 8. Compatibility with products in use.
 9. All aspects of finished appearance, including form, texture, and color, that may affect other design elements.
 10. Impacts to Project design, construction schedule, or construction sequencing.
- F. The Engineer shall be the sole judge in this matter. In the event the Engineer rejects the proposed items, the Contractor shall submit the Specified Items.
- G. The Contractor shall submit to the Engineer, in accordance with Public Contract Code Section 3400, after Contract award, no later than 35 Days after the date of NTP, a proposal for replacing a specified item with an equal item. At the sole discretion of the Engineer, the District may give written consent to the submission of the proposed Equivalent Item after the expiration of a 35-day time limit.

7.09. Sole/Single Source

- A. No substitution of designated Sole/Single Source items listed in the Contract Documents shall be allowed.
- B. Wherever the District has made a finding and specified in the Contract Documents that a Sole/Single Source is required for one (1) or more of the listed reasons stated in the Public Contract Code Section 3400(c), the Material or Equipment specification shall list only one (1) manufacturer, catalog number, or trade name, followed by the designation "No Equal," "No Others Acceptable," "No Alternatives Allowed," "No Other Manufacturers Accepted," and/or similar language.

SECTION 8. SAFETY AND SECURITY MANAGEMENT

8.01. Public Safety

- A. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during the performance of the Work, except from the District's sole negligence or intentional misconduct. The Contractor's compliance with this requirement is not limited to normal working hours.
- B. At all times, the Contractor shall provide for public safety and convenience. The Contractor's operations shall be conducted so as to offer the least possible obstruction and inconvenience to the public along with the greatest safety to the public. At no time shall the Contractor have more Work underway than can be prosecuted with proper regard to these considerations to the public.
- C. At all times, the Contractor shall provide sufficient measures, such as, but not limited to, fences, barriers, barricades, railings, lights, signs, and any other warning devices and shall provide flagging and guards as are necessary to give adequate warning of any dangerous condition to the public and to reasonably and prudently provide for the greatest public safety and convenience. The Contractor shall comply with all reasonable requirements of the Engineer or public agency having jurisdiction in interpreting this subparagraph.

8.02. Accident Prevention

- A. The Contractor is hereby informed that Work on this Project could be hazardous. The Contractor shall instruct all personnel working in potentially hazardous work areas of the potential dangers and shall provide safety Equipment and instruction as is necessary to prevent injury to personnel and damage to property. Special care shall be exercised relative to Work around high-voltage wires, high-pressure gas mains, high-pressure water pipelines, and other utilities. Temporary supports, as required by the utility company, shall be provided by the Contractor to protect utility facilities.
- B. The Contractor shall strictly comply with all applicable City, County, and State Rules, Ordinances, Regulations, and Codes, including, but not limited to, CAL OSHA Labor Code Section 6300 et seq. and California Code of Regulations Title 8, Chapter 4. Nothing in these Specifications shall be construed to permit Work not conforming to governing Codes. When Contract Documents differ from governing Codes, the Contractor shall furnish and install the higher standards called for without additional charge. The Contractor shall also take, or cause to be taken, additional measures as may be necessary for the prevention of accidents.
- C. The Contractor shall maintain an accurate record of, and shall report to the Engineer in writing, exposure data and all accidents resulting in death, traumatic injury, occupational disease, or damage to property, Material, supplies, or Equipment incident to Work performed under the Contract.

- D. If the Engineer notifies the Contractor of any noncompliance with the foregoing provisions, the Contractor shall, after receipt of this notice, immediately take corrective action. If the Contractor fails or refuses to comply immediately, the matter may be referred to the proper authority. No part of the time lost due to any stop order issued by a proper authority shall be made the subject of a Claim for extension of time or for extra costs or damages by the Contractor.
- E. Compliance by Subcontractors with the provisions of this Article shall be the responsibility of the Contractor.

8.03. Explosives and Stream Pollution

- A. When the use of explosives is necessary for the prosecution of the Work, the Contractor shall not endanger life or property.
- B. The Contractor must obtain and comply with permit(s) from all regulatory agencies for the storage and use of explosives.
- C. The Contractor must obtain a permit from the California Department of Fish and Wildlife, if required, in advance of the use of underwater explosives. The Contractor shall comply with all applicable requirements of the Fish and Game Code relating to stream pollution, particularly Section 5650.

8.04. Fires

- A. The Contractor must obtain and comply with the permit(s) from all regulatory agencies, including from the Bay Area Air Quality Management District (BAAQMD) if required, for fire-related activities.

8.05. Excavation Safety Plans

- A. In accordance with Labor Code Section 6705, Miscellaneous safety Provisions, excavations five (5) feet or more in depth shall not begin until the Contractor has submitted, and the Engineer has returned indicating "In Receipt Of," the Contractor's detailed plan for worker protection from the hazards of caving ground during these excavations. The plan may be reviewed by the Engineer for completeness in accordance with Federal, State, and Local regulations. The Engineer shall not be responsible for reviewing the accuracy of assumptions, data and information used, and procedures contained in the plan, or for the adequacy thereof. The plan shall show the details of the design of shoring, bracing, sloping, or other provisions to be made for worker protection during the excavations. The plan shall not allow the use of shoring, sloping, or a protective system less effective than that required by the Construction safety Orders. If the plan varies from the shoring system standards established by the Construction safety Orders, the plan (including calculations) shall be prepared, signed, and stamped by a registered Civil or Structural Engineer and by a registered Geotechnical Engineer in the State of California.

- B. These plans shall be accompanied by a copy of a Permit to Excavate that has been issued by the Division of Occupational safety and Health as required by Labor Code Section 6500 et seq.
- C. This Article shall be applicable regardless of the Contract Price(s).
- D. The Contractor's Engineer shall review the adequacy of the Contractor's work methods, Equipment, bracing, or scaffolding, or safety measures, in, on, or near the construction site.

8.06. Tunnel Construction Safety

- A. The Contractor shall comply with all applicable requirements of Labor Code Section 7950 et seq. regarding tunnel safety.
- B. The Contractor shall notify the California Division of Occupational Safety and Health and the Engineer before any initial construction may be started at any tunnels.
- C. The Contractor shall schedule a pre-job safety conference with representatives of the Division, District, employer, and employees before Work begins as required by Labor Code Section 7955. This conference shall include the employer's review of the construction plan and any special Equipment, practices, and potential safety and health problems. The Engineer shall be notified of the time and place of the conference.
- D. The District shall obtain the tunnel classification prepared by the Division of Occupational Safety and Health prior to the request for bids, whenever possible, and make it available to the Contractor. A notice of the classification and any special orders, rules, or regulations to be used in construction, remodeling, demolition, or operation of the tunnel or underground mine shall be prominently posted at the site by the Contractor.

8.07. Confined Space Program

- A. The Contractor working in or supporting work in a confined space shall have a Confined Space Program.
- B. The Contractor shall submit a copy of its confined space program document to the Engineer. The program document shall be in compliance with all requirements of California Code of Regulations Title 8, Sections 1950 – 1962, and other applicable confined space requirements. Entry into a confined space shall not occur until the Contractor has submitted, and the Engineer has returned, indicating "In Receipt of," the Contractor's Confined Space Program document.
- C. The Contractor shall ensure that all of its employees and Subcontractors working in or supporting Work in a confined space have received all training mandated by

Cal/OSHA and meet any other Cal/OSHA requirements related to the Work. All entries into confined spaces shall be coordinated with the Engineer.

- D. The Contractor shall provide confined-space rescue services for all Work performed in a permit-required confined space and for all entrants to a permit-required confined space regardless of the entrant's employer.
- E. All employees of the Contractor or Subcontractor performing rescue services shall have received previous training, as applicable, in (i) atmospheric monitoring and ventilation; (ii) communication; (iii) emergency, self-rescue, and non-entry rescue operations; (iv) permit systems; (v) signs, symptoms, and consequences of exposure to contaminants; (vi) first aid and CPR; (vii) lockout/tagout; (viii) fall protection; (ix) electrical safety; and (x) respiratory protection.
- F. The required training as described in Paragraph E above, shall be per established industry standards (i.e., the latest version of ANSI Z117.1, Safety Requirements for Confined Spaces, American National Standards Institute); and per Cal/OSHA regulations (i.e., California Code of Regulations, Title 8, Sections 1960[b] and 5157[k].) All rescue personnel shall also have practiced making permit space rescues at least once every 12 months by means of simulated rescue operations in which they remove dummies, mannequins, or actual persons from actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed. This training shall have taken place no more than 12 months before the Work to be performed on this Project begins.
- G. Prior to the start of Work, the Contractor or any Subcontractor performing Rescue Services, shall submit to the District for review, a Rescue Training Certification (District Form FC 1767) included at the end of this Section, if/when it becomes necessary for District staff to enter a permit required confined space.
- H. Prior to entry, the Contractor shall post the most current copy of its Rescue Training Certification form (without its attachments) at the worksite where rescue services are to be provided.
- I. The Contractor shall submit an updated Rescue Training Certification form to the Engineer prior to the performance of each rescue service event. In addition, the Contractor shall submit an updated form to include any personnel not previously identified.

8.08. Temporary Facilities

- A. Use construction hoists, elevators, scaffolds, stages, shoring, and similar temporary facilities of ample size and capacity to adequately support and move loads to which they will be subjected. Provide railings, kick plates, enclosures, safety devices, and controls required by law or regulation or for adequate protection of life and property.

- B. Staging and falsework: Temporary support (e.g., formwork, falsework, or shoring) shall be designed and constructed in accordance with Construction Safety Orders, California Code of Regulations, Title 8, Sections 1541.1 and 1717. The falsework plan, shoring plan, and any required calculations shall be submitted, and the Engineer has returned indicating "In Receipt of," prior to commencement of any associated work on site.
- C. Warning devices and barricades: Identify and guard hazardous areas and conditions by visual warning devices, and, where necessary, by physical barriers per Cal/OSHA requirements; by the latest version of the California Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD); and by State agency permit conditions.
- D. Barricades: Place barriers at ends of excavations and along excavations to warn pedestrian and vehicle traffic of excavations. Provide barriers with flashing lights after dark. Keep barriers in place until excavations are entirely backfilled and fully compacted. Barricade excavations to prevent persons from entering excavation areas in streets, roadways, parking lots, or other public or private areas associated with the Project.
- E. Temporary enclosures: When sandblasting, spray painting, spraying of insulation, fireproofing, or other activities inconveniencing or dangerous to property or to the health of employees, District staff, or the public are in progress, the area of activity shall be enclosed adequately to contain the dust, over spray, or other hazard. In the event that there are no permanent enclosures of the area or that enclosures are incomplete or inadequate, the Contractor shall provide suitable, temporary enclosures. The Contractor shall submit to the Engineer a temporary enclosure plan for protection of open bodies of water from contamination. Temporary enclosures shall not hinder or adversely affect treatment plant operations.
- F. Above-grade protection: On multilevel structures, the Contractor shall provide safety protection that, as a minimum, shall meet the requirements of California Code of Regulations, Title 8 Industrial Relations.
- G. Fences: Enclose Work site with fencing adequate to protect the Work as necessary against acts of theft, violence, and vandalism. When entire site or part thereof is to be permanently fenced, permanent fencing may be built to serve as both permanent and temporary protection of the Work site, provided that any damaged or defaced fencing is replaced prior to final acceptance.

8.09. Injury and Illness Prevention Program

- A. Work shall not commence until the Contractor has submitted, and the Engineer has returned indicating "In Receipt of," the Contractor's Injury and Illness Prevention Program (IIPP). The IIPP shall comply with Cal/OSHA requirements California Code of Regulations, Title 8, Section 1509 (Construction), Section 3203 (General Industry), and other regulations as applicable. A copy of the

program shall be available at all times at the job site. The Contractor shall designate a Safety Officer who will monitor and enforce the IIPP.

8.10. Safety and Health Program for Hazardous Waste Operations

- A. The Contractor shall comply with California Code of Regulations, Title 8, Section 5192 and shall develop and implement a written safety and health program and a site-specific safety and health plan for employees involved in Hazardous Waste operations. The program shall be designed to identify, evaluate, and control safety and health hazards and provide for emergency response for Hazardous Waste operations. In compliance with Title 8, Section 5192, the written safety and health program shall incorporate:
 - 1. an organizational structure;
 - 2. a comprehensive work plan;
 - 3. a Site-Specific Safety and Health Plan;
 - 4. a safety and health training program;
 - 5. a medical surveillance program;
 - 6. the Contractor's standard operating procedures for safety and health; and
 - 7. any necessary interface between general program and site specific activities.

8.11. Site Safety and Health Supervisor

- A. The Contractor shall provide a site safety and health supervisor who has the responsibility and authority to develop and implement the site-specific safety and health plan and to verify compliance in accordance with California Code of Regulations.
- B. The site safety and health supervisor shall be a qualified and experienced safety and health professional whose sole duty is safety, health, environmental control, and monitoring and who shall be on-site during normal working periods and available 24 hours a day, seven (7) Days a week by telephone or by other approved means. Safety representatives from Subcontractors shall not be substituted for the Contractor's safety representative.
- C. The site safety and health supervisor shall meet, at a minimum, the following qualifications: five (5) years of construction project safety management experience on similar projects with OSHA 30-hour certified construction training or certified safety professionals (CSP) with experience in construction-related projects. The safety officer or other competent person shall maintain current training certificates in first aid and in CPR.

8.12. Site-Specific Safety and Health Plan

- A. The Contractor shall develop, implement, and verify compliance of a site-specific safety and health plan for Work on this Project.
- B. The safety and health plan shall conform to the requirements of all local, state, and federal ordinances, rules, regulations, and guidelines concerning occupational health and safety issues. It shall also include protocol to be utilized in the event unexpected materials or substances are encountered.
- C. The safety and health plan shall consist of procedures for the protection of the Contractor's personnel, including Subcontractors, District personnel, consultants, inspectors, and Supplier personnel working with Hazardous Material and the general public from Site-specific hazards.
- D. The safety and health plan shall be prepared and signed by a certified industrial hygienist (CIH). The safety and health plan shall identify the site safety and health supervisor who is responsible for the implementation of the plan.
- E. Should the types of activities and associated hazards change during the course of work, the Contractor's CIH shall amend the appropriate sections of the safety and health plan to reflect the changed site conditions. The revisions shall address the specific potential hazards to workers and to any others who will be involved in the construction that could result from exposure to the new hazard(s).
- F. The Contractor shall keep a copy of the safety and health plan at the job site at all times and shall provide a copy to all personnel working on site. All Contractor personnel performing work on-site shall be required to read the safety and health plan and shall be required to sign an acknowledgment that he/she has obtained and read a copy of the safety and health plan. No worker shall be allowed to perform Work on the site until a copy of his/her signed acknowledgment has been submitted to the Engineer by the Contractor. At a minimum, the safety and health plan shall consist of the following items:
 - 1. Project Organization: To include project manager, project site safety officer, superintendent, forepersons, Subcontractors, any team leaders, and other workers and shall address their roles and responsibilities.
 - 2. Work Plan: Address anticipated Project activities and objectives of the site operations; identify performance tasks for the Project, methods, and activities for accomplishing these tasks, task hazard analysis for each task activity listed in the safety and health plan, personnel requirements, personnel training requirements, and medical monitoring requirements for site personnel.
 - 3. Site Safety Meetings: Include the frequency of the meetings, who will conduct the meetings, time of day meetings will be held, general topics that will be covered at the meetings, and documentation protocol.

4. Employee Training Assignments: Discuss the training elements and the employees who received the training.
5. Review of the Site History for Overall Hazard Characteristics: Discuss physical and health hazards, site characterization, and known and potential exposures to Hazardous Material.
6. Site Control Program: At a minimum, specify the site work zones, site personnel training requirements for each class/type of worker, site protective clothing requirements, safe working practices, and site communication.
7. Personnel Medical Monitoring Requirements: Discuss requirements for each class/type of worker to be on-site and special condition hazards.
8. Personnel Protective Equipment Program: At a minimum, specify selection, personnel training requirements, Equipment storage requirements, Equipment maintenance and repair requirements, Equipment decontamination requirements, and Equipment limitations.
9. Engineering Controls: Specify additional engineering controls to be used for workplace safety, if any.
10. Monitoring: As applicable, at a minimum, specify monitoring methodology, frequency of monitoring, personnel training requirements to monitor, Equipment to be used, Equipment calibration methodology, and documentation protocol.
11. Material Handling: As applicable, specify machinery and Equipment to be used, tools to be used, containers to be used, and personnel training requirements for operators.
12. Decontamination: As applicable, specify procedures for decontamination area construction, personnel decontamination, Equipment decontamination, reinstate control, protective clothing debris control, and decontamination station personnel requirements.
13. Emergency Response Program: At a minimum, specify directions to the nearest medical facility, decontamination procedures for injured workers, and emergency Equipment available on-site.
14. Spill Contamination Contingency Program: Shall include provisions for gases, liquids, and solids.
15. Sanitation Facilities: Identify availability for workers and provisions for different sexes.

16. Illumination: If used during the Project, specify the condition requirements for use, type of illumination to be provided, and illumination locations on site.
 17. Confined Space Entry: Discuss personnel protective Equipment, ventilation method and Equipment, illumination method and Equipment, atmosphere testing and Equipment, safety protocol, and documentation protocol.
 18. Site Excavation: Discuss types of Equipment to be used, personnel training requirements, safety practices to be utilized, open excavation construction, and personnel entry safety.
 19. Safety Inspections: Identify scope of inspections, frequency and time of inspections, personnel qualification of inspector, and communications protocol.
- G. The Contractor shall comply with the safety and health plan. Noncompliance with the safety and health plan shall be grounds for temporary suspension of all Work. Suspension of Work for noncompliance shall not be grounds for additional time or compensation.
- H. The safety and health plan may be revised and/or amended by the Contractor and the Contractor's CIH as necessary during Work progress and as specified in these Specifications. Revisions and/or amendments to the safety and health plan shall be considered incidental to this item of Work; no additional payment shall be made.

8.13. Safety and Health Plan Implementation

- A. Providing for worker safety and personal protection is the Contractor's responsibility and shall be in accordance with the Contractor's safety and health plan. The Contractor is responsible for providing any and all training, monitoring, personal protective Equipment, protective clothing, devices, Equipment, and/or facilities necessary for ensuring worker safety as may be recommended and/or as specified in the Contractor's safety and health plan.
- B. The Contractor is responsible for ensuring that its personnel understand and comply with all site health and safety requirements specified in the safety and health plan.

8.14. Submittals

- A. This Article summarizes required safety-related submittals. This Article is not intended to be all inclusive. In addition, some submittal requirements specified below may not apply depending on the specific Work under this Contract. Contractor is solely responsible for identifying and submitting to the District and/or to appropriate authorities having jurisdiction all Submittals required by

applicable laws, rules, and regulations. The Contractor shall submit at a minimum the following items:

1. Injury Illness Prevention Program (IIPP): Shall be submitted and favorably reviewed by the Engineer prior to commencement of any Work on site. The District may review or comment on the IIPP. The District's review or comment on the IIPP does not in any way relieve the Contractor of (i) any responsibility or liability for the IIPP, and (ii) being solely, fully, and completely responsible for the safety of all persons and property at the job site.
2. Site-Specific Safety and Health Plan: Shall be submitted and favorably reviewed by the Engineer prior to commencement of any Work on site (if applicable). The District may review or comment on the safety and health plan. The District's review or comment on the plan does not in any way relieve the Contractor of (i) any responsibility or liability for the plan, and (ii) being solely, fully, and completely responsible for the safety of all persons and property at the job site.
3. Names and qualifications (résumés including education, training, experience, and certifications) for the designated site safety and health supervisor and other competent and qualified personnel to be used on the Project in support of job site safety requirements.
4. Completed Activity Hazard Analysis (AHA) or Job Hazard Analysis (JHA) submitted for all significant activities and tasks with a high-risk potential, describing the job steps, hazards associated with each job step, and the controls used to remove or minimize the associated hazards. No hazardous Work shall be allowed without an approved AHA or JHA.
5. Incident Investigation Reports: Submitted to the Engineer within 24 hours of the Project incident.
6. Project-Specific Hazardous Substances Communications Plan: Contractor shall prepare and submit plan and receive favorable review by the Engineer prior to commencement of sitework activities.
7. Safety Meeting Attendance Sheet ("Toolbox" meetings): Submitted to the Engineer within seven (7) working Days of the last working Day of the month.
8. Air Monitoring Results/Reports: Submitted to the Engineer on request (if applicable).
9. Monthly Field Project Report (including man-hours, incident/injury, and property damage reports): Submitted to the Engineer on a monthly basis within seven (7) Days of the last working Day of the month.

10. Heavy Equipment Inspection Forms: Submitted to the Engineer on request (if applicable).
11. Documentation for all Individuals Applicable to Regulatory Medical Surveillance Guidelines and HAZWOPER Training per Cal/OSHA Requirements: Submitted to the Engineer for review prior to beginning any Work associated with these requirements (if applicable).
12. Critical Lift Plans: Submitted to the Engineer on request (if applicable).
13. Crane Inspection Certifications: Submitted to the Engineer on request (if applicable).
14. Crane Operators Certification: Submitted to the Engineer on request (if applicable).
15. Applicable employee training and required medical approval documentation in compliance with Cal/OSHA standards.
16. Copies of detailed and documented quarterly crane inspections conducted by qualified individuals (if applicable).
17. Written crane inspections submitted to the Engineer on a daily basis.

8.15. Security Requirements at Job Site

- A. The Contractor shall make adequate provision for the protection of the Work area against fire, weather, theft, and vandalism and for the protection of the public against exposure to injury. All costs arising from theft, fire, or vandalism of the construction Material and Equipment shall be borne by the Contractor.
- B. During night hours, weekends, holidays, and during other times when no Work is performed at the site, the Contractor shall provide temporary closures or enlist services of security guards to protect temporary openings.
- C. The Contractor shall not allow its staff to stay at the Project site outside of specified hours of Work.

8.16. General

- A. The Contractor shall comply with the security requirements specified herein during the entire construction duration. These requirements are not to be construed to relieve the Contractor of its responsibility for the Work as specified in Article 4.11. Contractor's Responsibility for the Work.
- B. The Contractor's personnel includes the Contractor's own staff, including, but not limited to, all tiers of Subcontractor staff, manufacturer representatives, technicians, delivery drivers, etc.

8.17. Identification and Badging

- A. All Contractor personnel who enter the Project site are required to possess and carry a valid photographic identification. A current driver's license, or identification card issued by the California Department of Motor Vehicles or by other States, or a current passport is considered valid photographic identification. This identification shall be presented to District staff and security guards upon request. Contractor personnel without this identification shall be denied access to or shall be asked to leave the site.
- B. The District shall provide Project-specific identification badges for use by Contractor personnel. The District shall issue a photographic identification badge to each person who works at the site for more than five (5) continuous Days and generic (nonphotographic), temporary badges for Contractor personnel who work on an occasional basis (less than five [5] continuous Days.)
- C. The Contractor shall submit to the Engineer for approval a list of all Contractor personnel intended to work at the site for more than five (5) continuous Days. The list shall include the name, employer, and work phone number of each person. Upon approval by the Engineer, the Contractor shall complete a District furnished identification badge application for each eligible employee and make arrangements with the Engineer to have Contractor employee photographs taken at the District for the purpose of obtaining District-furnished photographic identification badges. Approved applications and valid photographic identifications shall be required before issuance of District photographic identification badges.
- D. Planned, occasional site access. The Contractor shall plan in advance all occasional (less than five [5] continuous Days) site accesses. The Contractor shall notify the Engineer of the name and employer of the Contractor's personnel requiring occasional site access at least one (1) Day in advance of each occasional site access. After sign in, the District's security guard will issue a generic, temporary badge to the occasional visitor. The occasional visitor shall return his/her badge to the security guard upon leaving the site.
- E. Emergency or unplanned site access. For emergency or unplanned access, as determined by the Contractor and approved by the Engineer and upon notification by the District's security guard, the Contractor designee shall verify to the District's security guard the identity of the Contractor personnel requiring emergency or unplanned site access. After sign in, the District's security guard will issue a generic, temporary badge to the emergency or unplanned visitor. The emergency or unplanned visitor shall return his/her badge to the security guard upon leaving the site.
- F. The Contractor shall ensure that all Contractor personnel display their District issued photographic identification badge or generic, temporary badge in plain view at all times while on-site. Any Contractor personnel who does not display his/her photographic identification badge or generic, temporary badge while on-site shall be required to leave the site.

- G. Lost or missing photographic identification badges shall be reported immediately to the Engineer; a generic, temporary badge shall be issued by the District's security guard. The District shall deduct \$100 for each lost or missing photographic identification badge from the Contract amount.
- H. Lost or missing generic, temporary badges shall be reported immediately to the Engineer; a generic, temporary badge shall be issued by the District's security guard. The District shall deduct \$100 for each lost generic, temporary badge from the Contract amount.
- I. The Contractor shall maintain a list of Contractor personnel in possession of a photographic identification badge. The Contractor shall record, at a minimum, the following information: employee name, employer, work phone number, badge issuance date, date when employee ceases working at the site, and date when badge was missing, lost, or returned to the District. The Contractor shall submit updated badge lists to the Engineer on or before the fifth Day of each month. The District may deduct from the Contract amount \$200 for each badge list not submitted on time. Approved lists shall be the basis for determination of the deductions for photographic badges not returned within the allowed time limit.
- J. The Contractor shall collect and return to the District photographic identification badges from all Contractor personnel within 30 Days from the date of their employment termination or when their assignment on-site is complete. If the Contractor fails to return the badges within 30 Days of the employee's termination or assignment completion, the District shall deduct \$100 from the Contract amount for each photographic badge not returned on time.
- K. At the completion of the Project, the Contractor shall return all District-issued photographic identification badges to the District. The District shall deduct \$100 from the Contract amount for each photographic badge unreturned or returned after Project Completion.

8.18. Background Checks

- A. The District reserves the right to request and receive this information as allowed by law and as required to complete a background check on any Contractor personnel who must enter the site.
- B. The District reserves the right to deny access to the site to any person, as allowed by law.

8.19. Site Access Control

- A. The District may maintain a security checkpoint at the gate(s) and facility(ies). The security checkpoint(s) may be staffed by a District security guard during normal working hours, and at other hours, on an as-needed basis. District roving guard(s) may also patrol the property.

- B. Unless otherwise specifically required in these Specifications, the entire site perimeter, including all fences and gates, are to remain intact and functional throughout the construction period. Fences and gates that are accidentally breached by the Contractor shall be restored by the Contractor at no additional cost to the District by the end of the workday at the latest. Perimeter breaches shall be secured by the Contractor until the breaches have been closed to the satisfaction of the Engineer. For work requiring perimeter breaches, the Contractor shall work with the Engineer to arrange appropriate measures to secure the perimeter at the Contractor's cost. The Contractor shall promptly inform the District of any accidental perimeter breaches. No unauthorized entries shall be allowed in these breaches, including deliveries and Contractor personnel.
- C. All vehicles entering the Project site are subject to search by District guards.

8.20. Mail and Postal Deliveries to the Project Site

- A. Unless an exception is granted by the Engineer, the Contractor shall not have United States Postal Service, Federal Express, UPS, or similar mail and package deliveries addressed to any District facility. Under no circumstance shall mail/packages be delivered to the reception area of any District facility.

8.21. Productivity Lost for Noncompliance With Security Measures

- A. Costs and delays incurred by the Contractor due to security measures (e.g., deliveries or personnel held at the gate without badges or identification, refusal of package deliveries, etc.) shall not be cause for additional Contract Time(s) or for additional compensation for the Contractor.
- B. Failure to comply with these security measures may lead to Delay or to stop of the Work with no additional Contract Time(s) or additional compensation granted to the Contractor.

8.22. Payment

- A. Full compensation for doing all Work and furnishing all Material required to comply with site safety and security requirements as specified in these Specifications shall be considered incidental and shall be included in other items of Work; no additional payment shall be made.



Enter Company Name Here
RESCUE TRAINING CERTIFICATION
 FC 1767 (01-31-14)

Contractor shall ensure that all its employees working in or supporting work in a confined space have received all training mandated by Cal-OSHA and meet other Cal-OSHA requirements related to such work.

All employees of the Contractor or subcontractor performing rescue services must have received previous training in (1) Atmospheric monitoring and ventilation; (2) Communication; (3) Emergency self-rescue, and non-entry rescue operations; (4) Permit system; (5) Signs; (6) First aid and CPR; (7) Lockout/tagout; (8) Fall protection; (9) Electrical safety, and (10) Respirator protection.

Rescue services training must have been performed consistent with established industry standards (ANSI Z117.1, Safety Requirements for Confined Spaces, American National Standards Institute and Cal/OSHA regulations). All trained employees must have practiced making permit required confined space rescues at least once every twelve months by means of simulated rescue operations in which they remove dummies, mannequins, or actual persons from actual permit spaces or from representative permit spaces. Representative permit spaces must, with respect to opening size, configuration and accessibility, simulate the types of permit spaces from which a rescue could be performed. Such training shall have taken place no more than twelve months before the work to be performed on this Project begins.

With regard to employees of Contractor or any subcontractor performing rescue services, prior to the start of work, Contractor shall submit for review and acceptance by the District all of the following information in the spaces designated below: a certification with the respective employee's name, the name(s) of the trainers, the dates of all rescue practice sessions, and brief descriptions of the rescue practice sessions. Copies of all written materials provided during the training courses or rescue practice sessions shall be attached to this form. Prior to entry, the Contractor shall post copies of such certifications (without their attachments) at the worksite where rescue services are to be provided.

PREPARED BY		PHONE NO.	E-MAIL ADDRESS	COPIES OF ALL WRITTEN MATERIAL PROVIDED DURING THE TRAINING COURSES OR RESCUE PRACTICE SESSIONS
EMPLOYEE'S NAME	DATE OF LAST INCLUSIVE TRAINING (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)	DATE OF LAST PRACTICE RESCUE SESSION (ANNUAL)	TRAINER NAME/COMPANY	DESCRIPTION OF THE RESCUE PRACTICE SESSION (BRIEF)
1				☐ Yes ☐ No
2				☐ Yes ☐ No
3				☐ Yes ☐ No
4				☐ Yes ☐ No
5				☐ Yes ☐ No
6				☐ Yes ☐ No
7				☐ Yes ☐ No
8				☐ Yes ☐ No
9				☐ Yes ☐ No
10				☐ Yes ☐ No

I Certify that the information provided is true and correct.

SIGNATURE	PRINT NAME	TITLE
DATE PREPARED	COMPANY ADDRESS	

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SECTION 9. QUALITY MANAGEMENT

9.01. General Quality Requirements

- A. This Section includes quality control (QC) requirements and procedures for Materials, products, Equipment, and workmanship; inspection procedures and limitations; sampling and testing of Materials; and Contractor's quality assurance/quality control (QA/QC) program.
- B. The Contractor shall provide and use Construction Equipment and plants capable of producing the quality and quantity of Work required. Construction Equipment shall be identified by readily visible numbers. If ordered, the Contractor shall remove unsatisfactory Construction Equipment and discontinue the operation of unsatisfactory plants.

9.02. District Quality and Environmental Policy Training

- A. The following training requirements are minimum requirements. This training is required as part of the District's Quality and Environmental Management System (QEMS) and required for ISO certification. Additional training may be required in accordance with the Special Provisions for environmentally sensitive Projects.
- B. The following applies to all Contractor and Subcontractor Project personnel:
 - 1. The Contractor is hereby informed that all supervisory-level personnel must attend QEMS training before Work begins on the Project site. All other Contractor personnel must attend QEMS training within seven (7) Days of beginning Work on the Project site.
 - 2. QEMS training will be administered by the District and will include one (1) 30-minute training session for all staff. It may be necessary to conduct training at the District's headquarters building. All personnel shall sign a acknowledgement that they have attended the subject training.
 - 3. Upon completion of training, personnel will be provided with a QEMS training sticker to be placed on their hard hats. The District may require training on an annual basis.

9.03. Contractor's Quality Control Program

- A. The Contractor's Quality Control (QC) program is the successful and systematic execution of a realistic plan to certify that required standards of quality design and construction are met and to preclude problems resulting from poor quality or lack of quality. In performing its QC function, the Contractor develops procedures to manage and control its Material, Equipment, personnel, and work so that the completed Work complies with the Contract requirements. The Contractor, in building to the quality standards in the Contract Documents, controls the quality of the Work.

- B. The Contractor shall establish and execute a QC program for services that are procured by the Contractor. The program shall provide the Contractor with adequate measures for verification of and conformance to defined Contract requirements by the Contractor's personnel and lower-tier Subcontractors (including fabricators, Suppliers, and sub-contractors).
- C. When required, as stated in the Special Provisions the Contractor shall submit to the Engineer a Project-specific QC plan. The QC plan shall contain a comprehensive account of the Contractor's QC procedures as applicable to this Work. Detailed requirements for this QC plan are delineated in the following paragraphs. The Engineer's review of the Contractor's QC plan shall not relieve the Contractor from any of its obligations for performing the Work. No Work shall start until the Contractor's QC plan has been favorably reviewed by the Engineer. No payments shall be made to the Contractor until the QC plan is favorably reviewed by the Engineer.
- D. The QC Plan shall demonstrate that it has qualified QC personnel who meet or exceed the requirements of Special Provisions Article 20.04.02. Contractor's Quality Staffing Requirements. The QC plan shall identify the independent testing firms to be used in accordance with Article 9.09. Testing.
- E. The Contractor's QC program shall ensure the achievement of adequate quality throughout all applicable areas of the Contract. The QC plan shall describe the program and include procedures, work instructions, and records. In addition, the Plan shall describe methods relating to areas that require special testing and procedures as noted in the Specifications.
- F. Identification and Control of Items and Material: Procedures to ensure that items or Material that have been accepted at the site are properly used and installed shall be described in the QC plan. The procedures shall provide for proper identification and storage and prevent the use of incorrect or defective Material.
- G. Inspection and Tests: The Contractor shall have written procedures and checklists defining a program for control of inspections performed; these procedures and checklists shall be described in the QC plan. Procedures shall include specific instructions for observing all Work in process and for comparing this Work with the Contract requirements (organized by Specification section), precluding the covering of deficient or rejected Work, halting or rejecting Work, and resolving differences between the Field QC Representative(s) and the production representative(s).
- H. A complete matrix listing all operational, performance, and QC tests and inspections required in the Contract Documents: Each entry in the matrix shall include the Specification Section and paragraph; test/inspection description; procedure used; on/off-site; test frequency and acceptance criteria; and testing firm conducting each test. Below is a sample showing one (1) particular test:

Test and Inspection Plan Table

Spec Section	Test/Inspection Description	Procedure Used	On/Off site	Frequency	Acceptance Criteria	Conducted by	Documentation /Report	Notes
15453.3.04.B	Hydraulic Pressure Test	15453.3.04.B	On	After leak test, 2 hours	30 ft	John Smith	Hydro-test Report	

- I. The QC plan shall identify all contractual hold/inspection points, as well as any Contractor-imposed hold/inspections points.
- J. The QC plan shall include procedures to provide verification and control of all testing provided by the Contractor.
- K. Supplier Quality Control (SQC): The QC plan shall include procedures to ensure that procured products and services conform to the requirements of the Specifications. This plan shall include periodic visits to the place of manufacture by the Contractor to perform QA activities. The District shall be notified of all such SQC visits a minimum of two (2) weeks in advance in case it elects to attend the visit. Requirements of these procedures shall be applied as appropriate to lower-tier Suppliers and/or to Subcontractors.
- L. Deficient and Nonconforming Work and Corrective Action: The QC plan shall include procedures for handling deficiencies and non-conformances. Deficiencies and non-conformances are defined as documentation, Drawings, Material, Equipment, or Work not conforming to the contractually specified requirements or procedures. The procedures shall prevent non-conformances by identification, documentation, evaluation, separation, disposition, and corrective action to prevent recurrence. Conditions having adverse effects on quality shall be promptly identified and reported to the Contractor's senior-level management and to the Engineer. The cause of conditions adverse to quality shall be determined and documented and measures implemented to prevent recurrence. In addition, at a minimum, this procedure shall address:
 1. Personnel responsible for identifying deficient and non-complying items within the Work.
 2. The manner/process and the name of personnel by which deficient and noncompliant items are documented "in the field."
 3. The personnel and process utilized for logging deficient and noncompliant work into a deficiency log at the end of each Day.
 4. Tracking processes and documentation for deficient and noncompliant items.
 5. Personnel responsible for achieving resolution of outstanding deficiencies.
 6. Once resolved, the manner/process by which the resolutions are documented and by whom.

- M. Special Processes and Personnel Qualifications
 - 1. The QC plan shall include detailed procedures for the performance and control of special processes (e.g., welding, soldering, heat treating, cleaning, plating, nondestructive examination, etc.).
 - 2. Personnel performing special process tasks shall have experience, training, and certifications commensurate with the scope, complexity, or nature of the activity. The Contractor shall submit personnel qualifications information to the Engineer before the start of Work on the Project.
- N. The Contractor's QC staffing is subject to the Engineer's continued review. The Engineer, at its sole option and without cause, may direct the Contractor to remove and replace the Field QC Representative.
- O. Audits: The Contractor's QC program shall provide for documented audits on a quarterly basis to verify that QC procedures are being fully implemented by the Contractor as well as by its Subcontractors and Suppliers. Audit records shall be submitted to the Engineer within five (5) business Days after an audit.
- P. The Engineer may perform independent QA audits to verify that actions specified in the Contractor's QC plan have been implemented. No Engineer audit finding or report shall in any way relieve the Contractor from any requirements of this Contract.

9.04. Quality Coordination Meetings

- A. The Contractor shall provide, at a minimum, five (5) working Days' advance notice and shall participate in the following three (3) QC coordination meetings. Minutes for each meeting shall be prepared by the Contractor's Field QC Manager and submitted to the Engineer. The meetings shall be mentioned in the Contractors daily inspection report with the minutes attached:
 - 1. Pre-submittal Conference
 - a. Prior to the Contractor's submittal of the QC plan, the Field QC Manager, its Superintendent, and other relevant personnel shall convene a QC coordination conference with the Engineer to review and discuss the QC plan. During the conference, mutual understanding of the QC plan requirements should be developed.
 - 2. Preparatory Meeting
 - a. Thirty (30) Days prior to beginning Work on each Definable Feature of Work (e.g., ceramic tile, fencing and gates, masonry, rough-in electrical, etc.), the Contractor's Field QC Manager, Superintendent, other Contractor QC personnel (as applicable), and the foreman responsible for the Definable Feature of Work

shall meet with the District Engineer. The meeting shall cover the following agenda, with minutes documented by the Contractor's Field QC Manager.

- 1) Review the Contract Plans and Specifications.
- 2) Review reference Codes and Standards.
- 3) Confirm that all required submittals have been approved.
- 4) Review relevant RFIs, field memos, and changes to the design of the Definable Feature of Work.
- 5) Review QC requirements for the Work, including inspection, testing, and acceptance and tolerance requirements.
- 6) Review critical installation procedures and quality compliance.
- 7) Examine Work area to assure that all required predecessor Work has been completed, that all required deficiencies have been corrected and approved, and that all documented, remaining deficiencies shall not impair the construction of the planned Definable Feature of Work.
- 8) Check availability of required resource and Equipment to perform the Work.
- 9) Review Activity Hazards to address safety precautions.
- 10) Determine commencement of the initial meeting.

3. Initial Meeting

- a. One (1) workday before the beginning of construction of a Definable Feature of Work, the Contractor's Field QC Manager, Superintendent, other CQC personnel (as applicable), and the foreman responsible for the Definable Feature of Work shall meet with the Engineer. The meeting shall cover the following agenda, with Minutes documented by the Contractor's Field QC Manager.
 - 1) Review minutes of the preparatory meeting.
 - 2) Verify specified Material and Equipment is on-site.
 - 3) Establish level of workmanship and verify that it meets minimum acceptable workmanship standards.

- 4) Compare with required samples and mockups as appropriate.
- 5) Verify adequacy of QC for the Work, including availability of test Equipment.
- 6) Resolve all differences.
- 7) Indicate exact location of initial phase in the minutes for future reference and comparison with follow-up phases.
- 8) Repeat the initial phase for each new crew to work on-site or any time accepted or specified quality standards are not met.

9.05. Documented Quality Control Records

- A. The Contractor shall establish control methods of Contract Documents that describe how Drawings and Specifications are received and distributed to assure the correct issue of the document is being used. The methods shall also describe how as-built data are documented and furnished to the Engineer.
- B. The Contractor shall maintain evidence of activities affecting quality, including operating logs, records of inspections and tests, audit reports, Material analyses, personnel qualification and certification records, procedures, and document review records.
- C. Quality records shall be maintained in a manner that provides for timely retrieval, and traceability. Quality records shall be protected from deterioration, damage, and destruction.
- D. The Contractor shall provide a list of QC records as specified in the Contract Documents that will be furnished to the Engineer at the completion of activities.

9.06. Inspection and Daily Reports**9.06.01. Inspection**

- A. The Contractor shall utilize qualified individuals to perform and document inspections and tests. At a minimum, "qualified" shall mean having performed similar QC functions on similar-type projects. Records of personnel experience, training, and qualifications shall be maintained and made available for review by the Engineer upon request.
- B. The Engineer shall at all times have access to the Work during its construction and shall be furnished with every reasonable facility for ascertaining that the Material and the quality of performance are in accordance with the requirements and intentions of the Drawings and Specifications. All Work done shall be subject to the Engineer's inspection as well as by external parties.

- C. The day-to-day inspection performed by the various inspectors employed by the District shall not constitute approval or ratification of Work improperly done by the Contractor. The Engineer is the only person authorized to recommend acceptance of Work and Material.
- D. The presence or absence of an inspector during performance of the Work shall not relieve the Contractor of any obligation to fulfill the Contract. It shall be the duty of the Contractor to see that all provisions are complied with in detail, irrespective of the inspection given the Work during its progress by the Engineer or by representatives of the Engineer. The District and the Engineer shall assume no responsibility for any plan or method suggested to the Contractor by the Engineer or by an inspector that is not specified or required. Any such suggestion shall be used at the risk and responsibility of the Contractor.
- E. Inspection does not waive or alter the requirements or provisions of the Contract Documents. Inspection of the Work or receipt of payment shall not relieve the Contractor of its obligation to fulfill all conditions of the Contract; improper Work shall be subject to rejection.
- F. No portion of any Work, installed Material, products, or Equipment shall be covered or concealed in any manner without first being inspected by the Engineer. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any Work under this Contract, the Contractor shall notify the Engineer not less than one (1) Work Day in advance to request inspection before beginning any such Work of covering. Failure of the Contractor to notify the Engineer at least one (1) Work Day in advance of any such inspections shall be reasonable cause for the Engineer to order a sufficient Delay in the Contractor's schedule to allow time for such inspection. If any Work, Material, products, or Equipment is covered prior to inspection or prior to the express approval of the Engineer, that Work, Material, products, or Equipment shall be uncovered at no additional cost to the District. All associated costs, including its impact on other portions of the Work, shall be borne by the Contractor.
- G. The Contractor shall not conceal any part of the Work until record Drawing information has been taken and recorded by the Contractor.
- H. Should it be considered necessary or advisable by the District at any time before acceptance of the entire Work to make an examination of Work already completed by removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and Material. If such Work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or of Subcontractors, the Contractor shall defray all of the expenses of this examination and of satisfactory reconstruction. If, however, the Work is found to meet the requirements of the Contract, an equitable adjustment shall be made in the Contract Price(s) to compensate the Contractor for the additional services involved in the examination and reconstruction, and if completion of the Work has been delayed thereby, the Contractor shall, in addition, be granted a suitable extension of time.

- I. Work, Material, products, and Equipment not conforming to the Contract Documents shall be considered defective and shall be corrected or removed and replaced with conforming Work, Material, products, and Equipment at no additional cost to the District.

9.06.02. Daily Inspection Reports

- A. The Contractor is required to submit a daily QC inspection report providing factual evidence that required QC activities and/or tests have been performed. These records shall include the Work of Subcontractors and Suppliers and shall be on a form acceptable by the Engineer. Reports shall be made available at the end of each work day or no later than prior to the beginning of the next work day. Such reports shall, at a minimum, include the following:
 1. Item(s) inspected.
 2. Quality characteristics in compliance.
 3. Quality characteristics not in compliance.
 4. Corrective/remedial actions taken.
 5. Statement of certification.
 6. Field QC Representative's signature.
 7. Contractor/Subcontractor and its/their area of responsibility.
 8. Test and/or control activities performed with results and references to Specification/Drawing requirements.
 9. Test reports as attachments.
 10. Contractor's completed QC checklists, where applicable.
 11. Records of any SQC reports performed off-site as an attachment.
 12. Any Noncompliance Notices (NCN) issued.
 - a. An NCN shall be issued to document defective Work.
 - b. Corrective Action Reports (CAR) shall be completed to close out an NCN. An NCN may not be closed until the CAR is accepted by the Engineer.
 - c. A log of the NCN and the corresponding CAR shall be published at the end of each month.
 13. A Contractor's verification statement stating that each daily report is a complete, true, and accurate account of that Day's construction activity.

- a. These records in report form shall be prepared daily. The records shall be available in the field within 24 hours after the date covered by the report for review by the Engineer; all reports for that week shall be submitted weekly to the Engineer.
- b. Reports need not be submitted for Days on which no Work is performed. At a minimum, one (1) report shall be prepared and submitted for every seven (7) Days of no Work and on the last Day of a no-Work period. All Days shall be accounted for throughout the life of the Contract. The first report following a Day of no Work shall be for that Day only.
- c. Reports shall be signed and dated by the Contractor Field QC Manager. The report from the Contractor Field QC Manager shall include copies of reports prepared by all subordinate QC personnel.

9.07. Plant Inspection

- A. Material and Equipment that become a part of the completed Work shall be subject to inspection at the place of production or manufacture, at the shipping point, or at the site of the Work. Material and Equipment requiring inspection at the place of production or manufacture shall be designated by the Engineer. Where plant inspection is so designated, the Engineer shall be given a 14-day advance notice of the start of manufacture or of production. For international locations and sites outside of the continental United States, a minimum notification of 30 working Days shall be provided. The Contractor's purchase orders for Material and Equipment, for which plant inspection has been designated by the Engineer, shall bear a suitable notation advising Suppliers and Subcontractors of inspection requirements.
- B. If the required notification is not given, the District shall schedule the inspection at its convenience, and the activity to be witnessed shall not proceed until the Engineer arrives or until the District notifies the Contractor that it is choosing to waive its witness inspection requirement.
- C. The Engineer or an authorized representative shall have free entry at all times to such parts of the plant as concerns the manufacture or production of Material and Equipment for the District. Adequate facilities shall be furnished free of charge to make the necessary inspection.
- D. The Engineer may attend scheduled inspections of the off-site plant for Material, Equipment, or software to be incorporated into the Work. The District assumes no obligation to inspect Material or Equipment at the place of manufacture or production or at the shipping point. Unless otherwise noted in the Special Provisions, cost for District representatives to attend off-site inspections shall be borne by the District.

- E. In the absence of the Engineer, the District may reject the processes completed to date and require the activity to be redone. Delays resulting from waiting on the witness inspection for the reasons given above shall be considered an Inexcusable Delay. Expenses incurred by Delays or repeat of the Work process shall be borne by the Contractor.
- F. Should any inspection attended by the Engineer be delayed, the Contractor shall reimburse the District for the actual salary costs of District staff, consultants, and special inspection firms multiplied by their actual, fully burdened labor rates and shall reimburse the actual cost of other direct costs incurred due to the inspection Delay.
- G. The Contractor shall provide safe passage and access for inspection of the Work in any area. Off-site storage areas and warehouse facilities are also subject to inspection.
- H. Material, products, and Equipment that are specified to require testing and inspection at the point of origin shall receive and pass such testing and inspection prior to being shipped to the Project site.

9.08. Sampling of Material

- A. The Contractor shall furnish samples of Material as specified and as requested by the Engineer at no additional cost to the District. Samples shall be obtained and tested whenever necessary to determine the quality of the Material and compliance with the Contract Documents.
- B. The Contractor shall assist the Engineer, District staff, regulatory agency personnel, and third parties in collecting or providing samples.
- C. The Contractor shall not use Material specified to be tested in the Work until such testing indicates satisfactory compliance with the Contract Documents.

9.09. Testing

- A. Unless otherwise specified, the Contractor is responsible for completing all required testing at no additional cost to the District. All tests shall be performed by independent testing firms accredited by the appropriate authority.
- B. The testing firm shall be staffed with experienced personnel, properly equipped, and fully qualified to perform the tests in accordance with the specified standards. The Contractor shall submit documentation demonstrating that the testing firm and its personnel are properly accredited by the appropriate authority.
- C. The Engineer has the right to inspect Work performed by the independent testing firm. This may include inspection of the independent testing firm's internal QA records (e.g., QA manual, equipment calibrations, proficiency sample performance, etc.).

- D. Testing shall be completed in accordance with the specified standards in effect on the date bids are due. Where no standard is specified, testing shall be completed in accordance with the applicable ASTM and/or the latest published edition of the *State of California Department of Transportation Standard Specifications and Standard Plans* and updates thereto.
- E. The Contractor shall submit copies of all manufacturer test reports performed to satisfy the applicable Material standard specification or test standard (e.g., certified mill test reports). Reports shall identify the lot of Material represented by the test. The manufacturer test reports supplement the inspection, sampling, and testing provisions otherwise required by the Contract Documents.
- F. Content of Test Reports: Inspection and test results shall be documented and evaluated to ensure that requirements have been satisfied. Individual test records shall contain the following information:
 - 1. Date and time of test.
 - 2. Item tested, item number, and item description.
 - 3. Test designation.
 - 4. Test work sheet, including location the sample was obtained.
 - 5. Test results.
 - 6. Acceptance or rejection.
 - 7. Retest information, if applicable.
 - 8. Control requirements.
 - 9. Tester signature.
- G. The Contractor shall immediately inform the Engineer of all test results.
- H. Availability and Submittal of Test Reports: All test reports shall be made available to the District's representative for viewing within 24 hours and must be submitted to the Engineer within seven (7) Days after each test is completed, with the Contractor's weekly inspection reports. Each test report for each type of test shall be consecutively numbered. The Contractor shall maintain a copy of all test results on-site.
- I. Control of Measuring and Test Equipment: Measuring and/or testing instruments shall be adequately maintained, calibrated, and adjusted to maintain accuracy within prescribed limits. Calibration shall be performed at specified periods against valid standards traceable to nationally recognized standards and documented.

9.10. District Quality Assurance

- A. Quality assurance (QA) involves the activities of the District that are separate from, but in coordination and cooperation with, the Contractor to monitor that the level of quality set by the Contract Documents is achieved. Through periodic review, inspections, and tests, the District monitors that the Contractor's QC is working effectively and that the end product complies with the level of quality established by the Contract.

9.10.01 Testing by the District

- A. The District may arrange for independent tests at its own cost. In such cases, the Contractor shall cooperate with the District's independent testing firm. This testing by the District shall not relieve the Contractor of its obligation to do the QC testing required under the Contract.
- B. If independent testing indicates noncompliance with the Contract Documents, any retesting shall be charged to the Contractor.
- C. Upon request, the Engineer will furnish the Contractor with copies of test results.

9.10.02 Defective Work

- A. All Work not conforming to the Contract shall be considered defective and subject to rejection by the Engineer regardless of when or where the deficiency is detected. Unless otherwise permitted by the Engineer, rejected Work shall be remedied, removed, or replaced by the Contractor in a manner acceptable to the Engineer and at no additional cost to the District.
- B. Noncompliance Notice (NCN): The Engineer may issue a NCN to the Contractor for any detected defective Work or a portion thereof.
- C. The Contractor shall provide a written response within five (5) working days after receipt of the NCN. The Contractor's response shall detail either (i) reasons it believes that the Work was performed in accordance with the Contract Documents; or (ii) the corrective action it intends to take to correct the defective Work.
- D. If the Contractor disputes issuance of the NCN, the Engineer shall respond after receipt of the dispute by either (i) withdrawing the NCN; or by (ii) directing the Contractor to correct the Work. If the Engineer directs the Contractor to correct the Work, the Contractor shall make such correction within five (5) working days after receipt of such direction from the Engineer or at such other time as may be agreed to with the Engineer.
- E. If the Contractor fails to promptly comply with any order of the Engineer to correct the defective Work, the Engineer may terminate the Contractor's right to proceed with the affected Work and cause the defective Work to be removed and replaced at the Contractor's expense.

1. The District shall deduct from the Contractor's progress payment any cost it incurs in correcting the defective Work, including, but not limited to, rectifying the nonconforming Work, removing and storing salvageable Material and Equipment, discarding other Materials and Equipment, administrative costs, and all costs of repair or replacement of the Work of others.
2. If the District self-performs the remediation of the Contractor's nonconforming Work, the Contractor shall also be charged for the District's overhead markup.
3. If the current Contract unpaid balance and retention are insufficient to cover this amount, the Contractor shall reimburse the District.

9.11. Plumbing and Piping Quality

- A. The Contractor shall consult with industry and manufacturer representatives for all piping Material being used in the Work. The purpose of this consultation is to ensure that the Contractor's personnel are fully trained and knowledgeable, possess written instructions on proper assembly, and have all recommended tools for quality Work. Consultation shall also include discussions between industry and manufacturer representatives and Contractor management and construction staff on the causes of past plumbing and piping failures and of problems and methods of avoidance. The Contractor shall provide training for its forces as required to produce consistent, high-quality Work without failed tests and warranty problems.

9.12. Control of Materials and Equipment

- A. This Article includes general product requirements and requirements for delivery, storage, packing, loading, unloading, transportation, protection, and selection of Material and Equipment. Additional specific requirements for delivery, handling, protection, loading, and unloading may be specified within the Technical Specifications for Materials and Equipment.
- B. The Contractor shall furnish Materials and Equipment as specified. Only new Material and Equipment conforming to the requirements of the Contract shall be incorporated in the Work.

9.12.01. Source of Material and Equipment

- A. The Contractor shall furnish a list of sources of Material and Equipment to the Engineer in sufficient time to permit proper inspection and testing of Material and Equipment in advance of their use. Inspection and tests shall be made and reports rendered. It is understood that such inspections and tests shall not be considered a guarantee of acceptance of any Material or Equipment that may be delivered later for incorporation in the Work. Any Equipment or Materials that, after has in any way become non-compliant with the Contract, shall not be used in the Work.

- B. At the option of the Engineer, the source of supply of each of the Material shall be approved before the delivery is started. All Material proposed for use may be inspected or tested at any time during their preparation and use. If it is determined that sources of supply that appeared satisfactory do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved Material from other sources.

9.12.02. Product Data and Samples

- A. The Contractor shall furnish without charge such samples as may be required.
- B. No Material or Equipment shall be delivered to the Work without prior approval of submittals by the Engineer.
- C. The Contractor shall provide products by the same manufacturer when products are of similar nature, unless otherwise specified; provide identical products when products are required in quantity; and provide products with interchangeable parts whenever possible.
- D. The Contractor shall require each Equipment manufacturer to have maintenance facilities meeting the following minimum requirements:
 - 1. Minimum three (3) years' operational experience.
 - 2. Located in the continental United States.
 - 3. Equipment and tools capable of making repairs.
 - 4. Staff qualified to make repairs.
 - 5. Inventory of maintenance spare parts.
- E. All Materials, products, and Equipment shall be new, of the specified quality, and free of defects. Where samples have been submitted, the Materials, products, and Equipment incorporated into the Work shall be equal to the samples that have been approved. Should Materials, products, and Equipment required by the Work not be specified or described on the Drawings, the Contractor shall provide Materials, products, and Equipment of high, generally accepted quality standards that are comparable to the Work and that meet the identifiable needs of the Work.

9.12.03. Transportation and Delivery

- A. The Contractor shall:
 - 1. Transport and handle items in accordance with manufacturer's instructions.
 - 2. Schedule delivery to reduce long-term, on-site storage prior to installation and/or operation. Under no circumstances shall Equipment be delivered

to the site more than one (1) month prior to installation without written authorization from the Engineer.

3. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged, or sensitive to deterioration.
 4. Deliver products to the site in the manufacturer's original sealed containers or other packing systems, complete with Material Safety Data Sheets (MSDS) and instructions for handling, storing, unpacking, protecting, and installing.
- B. The Contractor may store Material and Equipment only in those locations approved by the Engineer. The Contractor is responsible for maintaining and restoring any affected areas as required by the Engineer.
- C. All items delivered to the site shall be unloaded and placed in a manner that shall not (i) impact the Contractor's normal construction operation or those of Subcontractors and other contractors; (ii) interfere with the flow of necessary traffic; and (iii) interfere with the District's normal operations and maintenance activities. In addition, the Contractor shall:
1. Provide necessary Equipment and personnel to receive, accept, and unload all items delivered to the site.
 2. Promptly inspect the shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e., the District, other Contractors), perform inspection in the presence of the Engineer and shall notify the Engineer verbally and in writing of any problems.

9.12.04. Storage and Protection of Material

- A. Store and protect products in accordance with the manufacturer's instructions with seals and labels intact and legible.
- B. Material and Equipment shall be stored to ensure preservation of quality and fitness for the Work. They shall be placed under cover when necessary and shall be stored in a manner that will facilitate prompt inspection.
- C. Loose granular Material shall be stored on solid, flat surfaces in a well-drained area. Mixing with foreign matter shall be prevented.
- D. Cement, lime, and similar moisture-sensitive Material shall be stored under a roof and off the ground and shall be kept dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground or to otherwise prevent accumulation of dirt or grease and in a position to prevent accumulation of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent

accumulation of dirt, standing water, staining, chipping, or cracking. Brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking, and spilling to a minimum.

- E. Material and Equipment storage areas shall be suitably secured to protect Material and Equipment from damage or from theft.
- F. Except as stated in the Contract Documents or as otherwise approved by the Engineer, locations and arrangements for storage sites for Material and Equipment shall be selected and maintained by the Contractor at the Contractor's expense. Full compensation for furnishing such storage sites as may be necessary or as required by the Contractor shall be considered as included in the Bid price; no additional payment shall be made.
- G. The storage and handling of potential pollutants and Hazardous Material, including, but not necessarily limited to, gasoline, diesel, oils, paint, and solvents shall be in accordance with all Federal, State, and Local Laws and all other requirements. Temporary special storage enclosures, double-walled tanks, berms, or other protective facilities shall be provided as required by law. All Hazardous Material shall be stored and handled in strict accordance with the MSDS for each product. A copy of each MSDS shall be maintained at the Project site by the Contractor.
- H. Any Equipment or Materials that, in the opinion of the Engineer, has become damaged as to be non-compliant with the Contract shall be promptly removed from the site of the Work. The Contractor shall receive no compensation for the Materials or Equipment removed or for removal costs.

9.12.05. Maintenance and Protection of Installed or Stored Equipment

- A. All mechanical and electrical Equipment and instruments subject to moisture or corrosive damage by the atmosphere if stored outdoors (even though covered) shall be stored in a weather-tight building and provided with adequate ventilation, as required, to prevent damage. The Contractor shall maintain temperature and humidity within the range required by the Equipment or instrumentation manufacturer. The building may be a temporary structure on the site or elsewhere, must be painted in a neutral color, and must be no larger than required.
- B. All Equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacturer.
- C. Moving parts shall be rotated or otherwise maintained in accordance with the manufacturer's instructions. Upon installation, the Contractor shall periodically exercise the Equipment to ensure that it does not deteriorate from lack of use.
- D. Lubricants shall be changed as frequently as required by the manufacturer between installation and acceptance. New lubricants shall be put into the Equipment at the time of acceptance.

- E. The Contractor shall maintain a preventive maintenance record for all Material and Equipment installed but not yet accepted that requires preventive maintenance by the manufacturer. A monthly report of all maintenance performed shall be submitted to the Engineer to certify maintenance has been performed as recommended by the manufacturer.
- F. The Contractor shall maintain and repair, as recommended by the manufacturer, any Equipment that has been installed but not yet accepted.
- G. The Contractor shall clean exposed Material and Equipment just prior to turnover to the District.
- H. Prior to the District's use or acceptance, the Contractor shall have the manufacturer inspect any Equipment valued at more than \$2,500 and stored longer than three (3) months and certify that its condition has not been detrimentally affected. Such certification must affirm that the Equipment has not been adversely impacted and the Equipment shall be guaranteed as specified. If such a certification is not provided, the Equipment shall be determined to be defective and shall be replaced at the Contractor's expense. Certification does not relieve the Contractor from meeting all testing requirements.

9.13. District-Furnished Material

- A. Material furnished by the District shall be available as designated in the Special Provisions. The Contractor shall load, unload, and haul such Materials to the site of the Work at the Contractor's expense. Once received by the Contractor, the Contractor is responsible for all Material furnished and shall pay any damages and storage charges.

9.14. Final Inspection of Work

- A. The Engineer shall make the final inspection of the Work in accordance with Section 11. Contract Closeout. The Contractor is directed to Section 11. Contract Closeout regarding the requirements necessary to obtain final inspection by the Engineer.

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SECTION 10. ENVIRONMENTAL

10.01. Good Neighbor Requirements

- A. The District is a public entity that takes seriously its responsibility to be a “Good Neighbor.” Accordingly, the District seeks to perform its activities, including construction of its facilities, in a manner that takes into consideration the needs of the neighborhood and that is minimally disruptive.
- B. The Contractor hereby acknowledges the critical importance of meeting the Contract requirements as set forth in these Specifications regarding “good neighbor requirements,” which include, but are not limited to, public safety, working hours, noise pollution and vibration, air pollution, spillage and dust, traffic control, truck haul routes and parking restrictions, and storm water pollution.
- C. The Contractor shall adhere to the above “good neighbor requirements” which relate to the lessening of the impact causes by the Work being performed under this Contract. The Contractor acknowledges that its responsibility to observe the restrictions of this Contract relating to the above requirements is significant, critical, and a material provision of this Contract. Any non-compliance with these requirements may be cause for the District to suspend Work.

10.02. Storm Water Pollution Prevention Plan

- A. The Contractor shall prepare and submit to the District an electronic and hard copy Storm Water Pollution Prevention Plan (SWPPP) as required under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharge Associated with Construction and Land Disturbance Activities Order No. 2009-009-SWQ, (as amended).
- B. The SWPPP shall incorporate all appropriate storm water Best Management Practices (BMPs) and all risk-based requirements to comply with the NPDES General Permit. The BMP descriptions and the template for the SWPPP shall be in accordance with the current California Stormwater Quality Association (CASQA) Construction BMP Handbook/Portal, which can be purchased at <http://www.cabmphandbooks.com>.
- C. The SWPPP shall be written, amended, certified, and stamped by a Qualified SWPPP Developer (QSD). The implementation of BMPs and all pollution control measures shall be overseen by a Qualified SWPPP Practitioner (QSP). The QSD and QSP shall be provided by the Contractor and shall meet the certification requirements as defined under Section VII of the NPDES General Permit.
- D. The District shall make available the following: base maps for the Contractor’s use in preparing the vicinity and site maps for the General Permit; a copy of preexisting site and site design information; and a copy of the completed Notice of Intent (NOI), if required.

- E. Prior to the commencement of any Work at the site(s), the SWPPP shall be favorably reviewed by the Engineer. Review by the Engineer shall not relieve the Contractor of responsibility for the completeness of the SWPPP nor for the accuracy of assumptions, data, and information used and procedures contained in the Contractor's SWPPP or the adequacy thereof.
- F. The SWPPP shall be revised and/or amended by the Contractor's QSD as necessary during the progress of Work to comply with Federal, State, and local regulations and the requirements of these Specifications. All revisions and amendments shall be submitted to the Engineer. Revisions and/or amendments to the SWPPP shall be considered incidental to this item of Work; no additional payment shall be made.
- G. The Contractor's personnel supervising the earthwork, sitework, erosion control, and sedimentation control and inspecting erosion controls shall be required to read the SWPPP. A copy of the SWPPP shall be maintained at the construction site by the Contractor and shall be available at all times for review by all Contractors, by the District, or by regulatory agency personnel.

10.02.01. Storm Water BMPs

- A. The SWPPP shall include appropriate BMPs, as required, to comply with the specified risk level for the Project.
- B. The Contractor shall design, construct, operate, inspect, and maintain the BMPs in accordance with the NPDES General Permit and with the instructions provided in the current CASQA Construction BMP Handbook/Portal.
- C. The BMPs shall include, but shall not be limited to, the following:
 - 1. Erosion control.
 - 2. Sediment control.
 - 3. Run-on/runoff control.
 - 4. Wind erosion control.
 - 5. Tracking control.
 - 6. Non-stormwater Management.
 - 7. Waste Management and Materials Pollution Control
 - 8. Project-specific Environmental BMPs as specified in the Contract.

10.02.02. Regulatory Fines

- A. The Contractor is responsible for any penalties or fines imposed upon the District by the Regional Water Quality Control Board (RWQCB) or by other regulatory

bodies due to the Contractor's noncompliance with the requirements of the NPDES General Permit. The actual cost of such penalties or fines shall be subtracted from the amount due, or that may become due, the Contractor.

10.03. Water Pollution Discharges and Remedies

- A. The Contractor shall remedy immediately any public nuisance or deficiency arising from, or in consequence of, the Contractor's failure to perform the Work specified under Article 10.02. Storm Water Pollution Prevention Plan and Article 19.02. Other Discharge Permits.
- B. Upon the Contractor's failure to make appropriate and timely remedies as directed by the Engineer in the best interests of the public, the Engineer may employ private or public workforces and Equipment to perform the Work. The Contractor shall be charged all costs associated with such remedy including actual hours recorded by District staff, District consultants, and District services, multiplied by their actual, fully burdened labor rates. Such action(s) taken by the Engineer shall not preclude the Engineer from taking other appropriate actions and shall not relieve the Contractor of responsibility to comply with these Specifications.

10.04. Water Quality

- A. The Contractor shall meet all applicable regulatory requirements to ensure that any discharges to surface waters will not cause violation to the State water quality standards or violation of regulatory permits issued by regulatory agencies.
- B. The Contractor shall prevent water quality degradation of water bodies and/or of storm drains. Water quality is measured in terms of pollution substances, turbidity, dissolved oxygen, pH, and temperature.
- C. Oily, greasy, or sediment-laden substances or other Materials that originate from the Contractor's operation shall not be allowed to enter, or be placed where they may later enter, any reservoir, river, creek, or stream.
- D. The Contractor shall comply with the requirements of the following permits, where applicable, and as specified in the Special Provisions, Article 19.04. Water Pollution Discharges:
 - 1. State Water Resources Control Board (SWRCB) and (NPDES), General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities
 - 2. U.S. Army Corps of Engineers CWA Section 404 Permit, and Regional Water Quality Control Board/State Water Resources Control Board CWA Section 401 Water Quality Certification. And/or Waste Discharge Permit.
 - 3. Other individual RWQCB NPDES Permits.

- 4. Department of Fish and Wildlife 1603 Stream Bed Alteration Agreement.
- E. The Contractor shall implement any additional water quality best management practices and mitigation measures described in these Specifications.

10.05. Burial Sites

- A. The Contractor shall comply with all applicable laws and regulations pertaining to burial sites, including, but not limited to, Ordinance Code Section B6-18 of the County of Santa Clara and requirements of Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. Upon discovering or unearthing any burial site as evidenced by human skeletal remains, the person making the discovery shall immediately stop work and notify the County Coroner. The Contractor shall also notify the Engineer. The Contractor shall immediately secure the site and protect any human remains from further disturbance.
- B. Upon determination by the County Coroner that the remains are Native American, the Coroner may contact the California Native American Heritage Commission and the County Coordinator of Indian Affairs. No further excavation or disturbance within 30 feet of the site or of any nearby area reasonably suspected to overlie adjacent remains may be made except as authorized by the California Native American Heritage Commission and/or by the County Coordinator of Indian Affairs, and by the Engineer.
- C. The Contractor is advised that if burials are encountered, it may be necessary to suspend Work on the Project to comply with the above requirements. Payment for a Delay of more than one (1) workday for each occurrence shall be made in accordance with Article 3.07. Change in Contract Price(s) and with Article 3.08. Change in Contract Time(s).

10.06. Cultural Resources (Archeological Discovery)

- A. The Contractor is advised that if archeological artifacts are encountered, the Contractor will immediately notify the Engineer; it may be necessary to suspend Work on the Project to comply with this Article.
- B. Work at the location of the find will halt immediately within 30 feet of the find. If an archaeologist is not present at the time of the discovery, the Engineer will contact an archaeologist for identification and evaluation pursuant to Public Resources Code Section 21083.2, California Code of Regulations Section 15126.4 (California Environmental Quality Act [CEQA] Guidelines) and to the mitigation measures of the Project CEQA document. If the archaeologist determines that the artifact is not significant, the Engineer will authorize the Contractor to resume construction.
- C. If the archaeologist determines that the artifact is significant, the archaeologist will determine if the artifact can be avoided and, if so, will detail avoidance procedures. The Contractor will comply with these avoidance procedures.

- D. If the artifact cannot be avoided, the archaeologist will develop an action plan that will include provisions to minimize impacts and, if required, a data recovery plan for recovery of artifacts in accordance with Public Resources Code Section 21083.2 and CEQA Guidelines Section 15126.4.
- E. The Contractor shall delay Work until the action plan and, if required, the data recovery plan, are favorably reviewed by the Engineer. Once the action plan and the data recovery plan are favorably reviewed, the Contractor shall comply with the requirements of these plans.

10.07. Noise Pollution and Vibration

- A. The Contractor shall be responsible for ensuring that noise produced by construction activities does not exceed the applicable local noise ordinance standards and is in compliance with the performance standards set forth in Section 18. Permits and Regulations of the Special Provisions.
- B. At a minimum, the Contractor shall exercise precautionary measures listed below. Implementation of these measures shall in no way relieve the Contractor of the responsibility of compliance with the noise criteria.
 - 1. Air compressors and internal combustion engines shall be in good operating condition that meet or exceed original factory specifications and shall be equipped with high grade mufflers, air inlet silencers (where appropriate), and noise suppressers.
 - 2. All mobile or fixed noise-producing machinery and Equipment, including "package" Equipment (e.g., fans, cranes, arc welders, air compressors, electrical operators, etc.), shall be suitably housed, enclosed, shielded, and equipped with noise-control features or muffled to meet the noise limits specified in the Special Provisions.
 - 3. All mobile or fixed noise-producing Equipment used by the Contractor that is regulated for noise output by Federal, State, or local law shall comply with this regulation while in use. This shall include vehicles licensed for use on public highways.
 - 4. Electrically powered Equipment instead of pneumatic- or internal-combustion-powered Equipment shall be used where feasible.
 - 5. The use of noise producing signals, including horns, whistles, alarms, and bells, shall be for safety warning and emergency purposes only.
 - 6. No music system, including personal or vehicle radio, tape, CD players, or the like, shall be audible at the Project right-of-way line.
 - 7. Trucks or other mobile Equipment shall not use engine decompression ("Jake Brakes") for deceleration on grades where feasible.

- C. The Contractor shall take all necessary precautions during its operations to limit peak particle velocities from vibratory compaction or percussion Equipment so that they do not become a public nuisance or result in property damage.
- D. Any Equipment causing noncompliance with the noise or vibration criteria shall be removed from the job site as directed by the Engineer.

10.08. Air Pollution

- A. The Contractor shall comply with all applicable requirements of the applicable air quality management or control district and California Air Resources Board regulations.
- B. Idling of internal combustion engines shall be held to an absolute minimum. All vehicles with internal combustion engines shall be fitted with spark arrestors.
- C. The Contractor shall not use any of the listed Materials banned by BAAQMD Regulation 8, Rule 15.
- D. Serpentine Materials that have average asbestos content greater than five (5) percent as determined by an aggregate bulk sample analysis pursuant to Air Resources Board Test Method 435 or an alternate method approved by the Air Resources Board or BAAQMD (see also California Code of Regulations, Title 17, Section 93106) shall not be used for surfacing.
- E. Except as provided by law, idling of heavy-duty diesel trucks with gross vehicular weight ratings of greater than 10,000 pounds shall be no more than five (5) minutes per California Code of Regulations, Title 13, Section 2485.
- F. The Contractor shall implement any additional air quality best management practices and mitigation measures described in these Specifications.

10.09. Spillage and Dust Control

- A. Care shall be taken to prevent spillage when hauling is done. Spillage resulting from hauling operations along or across any public-traveled way shall be removed immediately by the Contractor. The Contractor shall pay all expenses for removal of spillage.
- B. The Contractor shall control dust nuisances originating from the Contractor's operations either inside or outside the right of way.
- C. The Contractor shall provide all necessary precautionary measures to control dust and to prevent spillage on public-traveled ways. At a minimum, the Contractor shall provide the measures listed below and shall also implement additional dust control best management practices and mitigation measures described in these Specifications. Implementation of these measures shall in no way relieve the Contractor of the responsibility to comply with these Specifications.

1. Active maintenance areas, unpaved access roads, and staging areas shall be kept sufficiently moist and watered as necessary or shall be applied with nontoxic soil stabilizers to control dust generation.
 2. Trucks hauling sediments and other loose Material shall be covered and shall maintain at least six (6) inches of freeboard.
 3. Tailgates of trucks shall be sealed.
 4. Trucks shall be brushed down before leaving the site.
 5. Paved site access roads shall be swept using vacuum-powered street sweepers when visible soil Material is carried onto the roadway.
 6. During high winds, the excavation and grading activity shall be watered or the activity suspended, if necessary, to control dust.
 7. Inactive areas shall be sprayed with soil stabilizers or shall be seeded to avoid erosion or dust.
 8. Exposed stockpiles shall be watered, enclosed, covered, or sprayed with soil stabilizers.
 9. Traffic speeds within the Project right of way shall be limited to 15 mph. For off-site restriction, comply with local agency requirements.
 10. Sandbags or other bank protections shall be installed to prevent silt runoff to roadways.
- D. The Contractor shall immediately remedy any spillage and dust nuisance or deficiency arising from, or in consequence of, the Contractor's failure to perform the Work specified in these Specifications.
- E. Upon the Contractor's failure to make timely remedies determined by the Engineer to be necessary and in the best interests of the public, the Engineer may employ private or public workforces and Equipment to perform the Work. The Contractor shall be charged all costs associated with such remedy including actual hours recorded by District staff, District consultants, and District services, multiplied by their actual, fully burdened labor rates. Such action(s) taken by the Engineer shall not preclude the District from taking other actions as deemed appropriate and shall not relieve the Contractor of responsibility to comply with these Specifications.

10.10. Traffic Control

- A. Traffic control shall consist of all work and Materials necessary to maintain safe vehicular, pedestrian, and cyclist traffic during construction and to perform "best management practices" to mitigate high-peak and high-volume construction traffic, prevent idling and queuing, establish site access limitations and mitigation

measures, identify haul routes, and provide overall control of all construction traffic entering, exiting, and operating within the Project site.

- B. All traffic control Work shall be performed in accordance with the requirements of the local agency having jurisdiction and California Department of Transportation requirements, if applicable. If required, the Contractor shall prepare a traffic control plan and submit said plan to the Engineer and to the appropriate agency having jurisdiction for favorable reviews in advance of the Work at the site.
- C. The Contractor shall cooperate with the local agency having jurisdiction relative to handling traffic around the construction area. The Contractor shall make its own arrangements relative to keeping the Work area clear of parked vehicles to maintain sight visibility and access to adjacent properties. Existing road signs shall not be blocked at any time.
- D. Truck traffic and haul routes shall be in compliance with local permits and ordinances. The Contractor shall obtain, at the Contractor's expense, any required haul route permit from the local authority having jurisdiction for transporting to and from the Project site construction Material and the disposal of surplus Material.
- E. The Contractor shall conduct its operations and schedule cleanups that cause the least possible obstruction and inconvenience to traffic, pedestrians, cyclists, and adjacent property owners.
- F. Damage done by the Contractor during the course of its Work to adjacent city, town, county, or private property shall be repaired or replaced in kind and as directed by the Engineer.
- G. Personal vehicles of the Contractor's employees and the Contractor's Equipment and vehicles shall not, at any time, be parked on the traveled way, shoulders, medians, or lanes that have not been approved for closure. When entering or leaving roadways carrying public traffic, the Contractor's Equipment, whether empty or loaded, shall in all cases yield to public traffic and shall travel in the direction of the traffic. Flaggers and traffic signs may be required to control this activity. No driveways or private roads shall be blocked. Safe access must be maintained for pedestrian traffic throughout the Work areas at all times.
- H. Those parts of public streets, right of ways, and sidewalks that are allowed to be occupied by the Contractor shall be immediately vacated by the Contractor and returned to public use when the Contractor's use thereof is no longer necessary for the construction Work.
- I. The Contractor shall comply with and pay for all costs associated with Public Convenience Section 7-1.03; Public Safety Section 7-1.04; and Temporary Traffic Control Section 12 of the State Specifications; and Article 8.01. Public Safety, of these Standard Provisions Specifications. Nothing in these Specifications shall be construed as relieving the Contractor from its

responsibility as provided in Public Safety Section 7–1.04 of the State Specifications.

- J. The Contractor shall coordinate with the appropriate local agencies having jurisdiction to receive their approval in the event any temporary lane closures on public streets are needed for the Contractor's operation. Any traffic signing and flaggers as approved by the local agencies for said lane closures shall be in place prior to closing the lane to traffic.

10.11. Regulated Material Management

- A. Regulated Material includes, but shall not be limited to, Hazardous Material and Hazardous Waste.
- B. The Contractor is responsible for and shall obtain all required permits and pay all fees and taxes for satisfying the requirements of any regulatory agency for the storage, monitoring, usage, transportation, safety, and reporting, or for any other requirements regarding the management of Regulated Material on and off the Project site(s).
- C. The Contractor shall not allow Regulated Materials to spill on District property or on easements or on other public or private right of ways. Any spillage of Regulated Materials resulting from the Contractor's operation shall be removed immediately by the Contractor at the Contractor's expense.
- D. The Contractor shall immediately notify the Engineer of any potentially Hazardous Materials or Hazardous Waste encountered at the worksite and shall take all necessary action to prevent exposure of personnel until all material is identified and proper action can be taken.

10.11.01. Storage of Regulated Material

- A. Prior to the storage or use of any Regulated Materials, the Contractor shall submit to the Engineer a Regulated Materials Storage and Use Plan (Plan). The Plan shall include (i) an inventory of all Regulated Materials to be stored or used at the Project site that equals or exceeds any of the following separate material phases: 55 gallons liquid, 200 cubic feet of compressed gas, or 500 lbs. solid; (ii) the maximum quantity of Materials to be stored; (iii) purpose of the Materials; (iv) the MSDS for each Material; (v) a detailed description of how the Materials will be stored (including secondary containment where required by applicable regulatory agencies); (vi) a site plan drawn to scale; (vii) storage area maps drawn to scale; (viii) a detailed description of how the Materials will be monitored; (ix) a detailed description of how wastes from the Materials will be stored and/or disposed; and (x) a detailed description of the procedures to be followed in the event of an uncontrolled release of the Regulated Materials.
- B. The Plan shall be submitted to the Engineer and favorably reviewed at least 30 days prior to the storage or use of any Regulated Materials. The Plan shall be updated and submitted to the Engineer by the Contractor upon the addition of

new Regulated Materials not listed previously or upon a 100 percent (or greater) increase in quantity of a Regulated Materials that is listed in the plan.

10.11.02. Regulated Material Discharges or Releases

- A. The Contractor is responsible for all discarded or abandoned Material, including Regulated Materials and Hazardous Waste, generated as a result of the Contractor's operations unless specifically noted otherwise in these Specifications. The Contractor shall comply with Article 3.09. Differing Conditions.
- B. In the event of a discharge or release of a Regulated Materials from the Contractor's operation, the Contractor is responsible for notifying the proper authorities, providing containment of the material, identifying the contaminants, investigating the extent of all contaminants, testing and removing contaminated materials, disposing of contaminated materials, and verifying the removal of all contaminated materials. These activities shall be performed to the satisfaction of the Engineer at the Contractor's cost. The Contractor shall perform any Work and provide any and all documentation required by the District and by all Federal, State, and local agencies. The Contractor shall provide to the Engineer copies of all correspondence and reports related to these activities. All Work performed to accomplish these activities shall be in accordance with Federal, State, and local regulations.
- C. In the event of a discharge or release of Regulated Material, the Contractor shall notify the Engineer immediately. Immediate notifications may be verbal. The Contractor shall submit a detailed written report to the Engineer within 24 hours of the discharge or release. The written report shall include; a description of events leading to the discharge or release, action taken to prevent or control the discharge or release, a description of the discharge or release, the quantity of Material discharged or released, method used to determine the quantity discharged or released, type of Material discharged or released, MSDS for the Material(s) involved, a description of the area affected by the discharge or release, agencies notified and date and time of notification, and status of the cleanup. The report shall also include the proposed investigation, cleanup, and verification sampling activities.
- D. All expenses incurred by the Contractor as a result of or to remedy the discharge or release of Regulated Materials shall be borne solely by the Contractor; no additional compensation shall be made. The Contractor shall be responsible for signing the Nonhazardous Waste Manifests and the Hazardous Waste Manifests and for paying the State Superfund fees, the generator's fees, and other costs of disposal of these wastes unless specifically stated otherwise in these Specifications. The Contractor shall be identified as the owner and generator of the wastes associated with unauthorized releases or discharges.

10.11.03. Hazardous Waste

- A. The Contractor shall manage the Hazardous Waste generated from this operation in accordance with the Specifications below:
1. Labeling: The Contractor shall completely fill out and affix a "Hazardous Waste" label to each Hazardous Waste container for the Contractor's operations. Each Hazardous Waste label shall contain, at a minimum, (i) the words "HAZARDOUS WASTE"; (ii) information on the generator (i.e., name, address, phone number); (iii) EPA identification number for the waste stream; (iv) EPA and/or California Waste Code; (v) waste accumulation starting date; (vi) identification and content of the waste; (vii) the physical state of the waste (i.e., solid or liquid); (viii) and the hazardous property (i.e., flammable, toxic, corrosive, reactive, etc.). If the primary container is placed inside a secondary container, then the Contractor shall also prepare and affix another Hazardous Waste label on the secondary container.
 2. Secondary containment: The Contractor shall provide appropriate secondary containment for all storage areas for Hazardous Materials and Hazardous Waste. In the case of an installation with one (1) primary container, the secondary containment shall contain at least 110 percent of the volume of the primary container. In the case of an installation with multiple primary containers, the secondary containment shall contain 150 percent of the volume of the largest container or ten (10) percent of the aggregate internal volume of all primary containers in the storage facility, whichever amount is greater. If the storage facility or storage system is open to rainfall, then the secondary containment must be able to additionally accommodate the volume of a 24 hour rainfall as determined by a 25 year storm history.
 3. Accumulation time limit: The Contractor shall properly haul and dispose of all Hazardous Waste within 90 Days from the accumulation starting date identified on each Hazardous Waste label or on the completion date of the Contract, whichever event comes first. The waste accumulation starting date for each waste stream begins when the first drop of the waste is placed in the container.
 4. Hauling and disposal of waste: The Contractor shall be responsible for using appropriate Hazardous Waste haulers and disposing of all Hazardous Waste in accordance with Federal, State, and local regulations.
- B. Waste Manifests: Prior to issuance of the Project Completion letter, the Contractor shall submit copies of all Hazardous Waste Manifests signed by disposal facilities and certificates of disposal to prove that the Contractor has legally disposed of such materials. The Contractor shall submit four (4) copies of each manifest.

10.12. Non-regulated Materials

- A. Non-regulated Material is any substance that is not required by any Federal, State, or local regulations to have special management, storage, disposal, or handling practices.
- B. Non-regulated Material may be disposed at State-permitted, non-hazardous waste landfills.
- C. For non-regulated material to be reused or disposed of on-site or at a site other than a State-permitted landfill, the Contractor must obtain all required permits, agency approvals, and property owner agreements and pay all fees and taxes for all services and Materials required in conjunction with the management, transportation, disposal, and reuse of non-regulated materials.

10.12.01. Disposal at Other than State-Permitted Landfills

- A. The Contractor shall enter into an agreement with the property owner prior to disposal of materials and submit a copy thereof to the Engineer conveying a written consent from the property owner receiving the materials providing:
 - 1. a written authorization from the property owner to accept materials at duly noted quantities, types of materials (e.g., soils, debris, etc.), and the disposal property location address; and
 - 2. a written release from the property owner fully absolving the Santa Clara Valley Water District from any and all responsibility and legal liability toward any damage to life and environment in connection with the disposal of the materials on the property.
- B. Prior to the disposal of materials, the Contractor shall provide:
 - 1. copies of all applicable regulatory agency permits, approvals, licenses, and environmental clearances;
 - 2. site specific health and ecological risk assessment and/or compliance with applicable regulatory agency regulations or guidelines, including, but not limited to, the Environmental Screening Levels per the latest guidelines from the San Francisco Bay RWQCB;
 - 3. copies of documentation of communication made by the Contractor with appropriate regulatory agencies on evaluation of regulatory requirements and regulatory agency approvals for disposal of materials; and
 - 4. copies of laboratory testing reports for the materials to be disposed.
- C. Within 15 Days after the disposal of materials at the property location, the Contractor shall submit an acknowledgement duly signed by the property owner certifying the date of receipt of the materials, including quantity and types of

materials received (e.g., soils, debris, etc.), to prove that the Contractor has disposed of the materials at the location designated in the agreement.

- D. Waste Manifests: Prior to issuance of the Project Completion letter, the Contractor must submit copies of all Non-hazardous Waste Manifests signed by disposal facilities and certificates of disposal to prove that the Contractor has legally disposed of such materials. The Contractor shall submit four (4) copies of each manifest.

10.13. Imported Earthfill Material

- A. The Contractor shall not import earthfill material that is contaminated with Regulated Materials.
- B. If imported earthfill Material is, or is found to be, contaminated by Regulated Materials, the Contractor shall immediately remove the contaminated material and dispose of it in accordance with all applicable laws, ordinances, and regulations; conduct necessary sampling and monitoring to verify that all contaminated material has been removed; and verify to the satisfaction of the Engineer and/or to the appropriate regulatory agencies that any surrounding areas, materials, soils, or waters have not been impacted by the contaminated materials. The subsequent disposal of the contaminated material shall be the responsibility of the Contractor. No compensation shall be made to the Contractor by the District for removal, disposal, replacement, or chemical analysis, or for any other costs associated with the removal, disposal, and replacement of the contaminated material.
- C. For each imported earthfill material to be used on the Project, the Contractor shall submit to the Engineer completed Imported Materials Certification Form; copies of this form are available from the Engineer. If the imported earthfill materials are to be obtained from more than one (1) source, the Contractor shall submit a separate form for each source of earthfill material. This form shall be submitted at least 30 Days prior to the delivery of the earthfill material to the construction site and shall receive favorable review prior to delivery.
- D. The Engineer may obtain soil samples from the site and test them to monitor the Contractor's compliance with these Provisions.

10.14. Migratory Birds

- A. The Contractor shall comply with all applicable Federal and State laws, rules, and regulations related to the protection of migratory birds, including, but not necessarily limited to, the Federal Migratory Bird Treaty Act (16 USC 703-712 50 CFR Part 21 and 50 CFR Part 10) and the California Department of Fish and Game Code Sections 2000, 3503, 3503.5, 3513, and 3800.
- B. The Contractor shall carry out all activities in a manner consistent with the U.S. Fish and Wildlife Service's Migratory Bird Program. The Contractor shall not pursue, hunt, take, capture, kill, attempt to take, or possess any migratory bird

listed in 50 CFR 10.13, or any part, nest, or egg of any such bird. Active nests are those containing either an egg (or eggs) or young and/or nests used by birds of prey, regardless of the presence of eggs or of young. To determine the occupancy of nests, the Contractor shall rely upon the professional expertise of a Qualified Biologist. See Section 19. Environmental.

- C. The Contractor shall coordinate several measures, including (i) awareness and training of the Contractor's personnel on which bird species are protected, their nesting seasons, and seasonal variability; (ii) surveys to determine the presence of nesting birds in the Project area; (iii) establishment, maintenance, and removal of protective buffer zones around nests; (iv) installation and maintenance of exclusion devices; (v) nest prevention activities; and (vi) monitoring to ensure the adequacy of the compliance measures.

10.14.01. Scope of Work

- A. The Contractor shall be aware of migratory bird nesting seasons (generally from January 15 to August 31) and variability; provide training to all Contractor personnel on the Project; monitor the Project site; perform preventative and deterrence measures to prevent birds from nesting; preserve and protect pre-established protective buffer zones; perform surveys to determine the potential for protected species to be in the Project area; establish new protective buffer zones around un-prevented nests, as required; install and/or maintain exclusion devices, such as netting and/or wire mesh screens; monitor to assure the adequacy of the compliance measures; and perform any other Work as specified herein to comply with all applicable statutes.
- B. The Qualified Biologist shall monitor regulatory compliance, train Contractor personnel, and coordinate with the Engineer in conformance with (i) this Article; (ii) the Project specific Mitigation Monitoring and Reporting Program (MMRP) requirements relating to this Article; and (iii) all applicable permit conditions. The Qualified Biologist shall:
 - 1. Provide bird nesting awareness training for all personnel working on the Project, including all sub contractors.
 - 2. Monitor the Project site for nest starts and occurrences of active bird nests.
 - 3. Document the location, status, and species of bird for each active nest.
 - 4. Monitor the Work to ensure that protected birds are not disturbed in a manner that could result in noncompliance.
 - 5. Establish protective buffer zones around active nests as specified herein.
 - 6. Ensure protective buffer zones are maintained and nests are not disturbed. Advise when protective buffer zones are no longer needed and can be removed.

7. Monitor the maintenance and effectiveness of bird exclusion devices.
 8. Provide recommendations concerning vegetation management, installation of additional exclusion devices, and maintenance of such devices to prevent bird nesting. Advise when exclusion devices are no longer needed and can be removed.
- C. Within 14 Days of the First Chargeable Day, the District will release the site to the Contractor. Prior to the release, the Engineer and the Contractor shall assess the site to determine the presence of nesting birds and any existing protective buffer zones and exclusion devices within or near the construction areas. In no case shall the District maintain responsibility for the site for more than 14 Days after the First Chargeable Day. Upon release of the site, the Contractor assumes complete responsibility for the site, including Work site monitoring, existing protective buffer zones, and exclusion devices and shall perform all required Work as specified herein.

10.14.02. Migratory Bird Surveys

- A. The Qualified Biologist shall perform migratory bird surveys prior to any Project related activity that could pose the potential to affect migratory birds.
- B. The Contractor shall include activities for Qualified Biologist surveys on Project Schedules with assurance that the appropriate migratory bird surveys have been coordinated with the Qualified Biologist and will be performed in advance of activities.

10.14.03. Migratory Bird Monitoring

- A. The Contractor is responsible for ongoing monitoring to ensure that migratory birds, their active nests, eggs, and young are not harmed in any way.
- B. The Contractor and Qualified Biologist shall inspect all areas that may be affected by Project activities, including all vegetation, grounds, structures, and bridge(s), with sufficient frequency as needed to identify any new and partially built bird nests.
- C. At the direction of the Engineer and the Qualified Biologist, the Contractor shall be responsible for the removal of any inactive or partially built bird nests with the exception of raptor nests. No birds, nests with eggs, or nests with hatchlings shall be disturbed, nor shall raptor nests be removed unless specified in the Special Provisions Article 19. Environmental.

10.14.04. Protective Buffer Zones

- A. Existing protective buffer zones, if any, are shown on the Drawings or shall be communicated to the Contractor prior to the District releasing the site. In addition to District-established buffer zones, new protective buffer zones shall be required if a nest is established or discovered during the Contractor's activities. In the

event that an active nest is discovered in the Project area, or in adjacent areas considered to have the potential to be disturbed by the Contractor's activities, the Contractor shall notify the Engineer and establish a protective buffer zone around the nest. The exact location of the boundaries of protective buffer zones shall be established by the Qualified Biologist and approved by the Engineer. The Contractor shall install temporary fencing at the boundary of each new protective buffer zone except as otherwise directed by the Engineer. The fencing shall be Type ESA Temporary Fence per Caltrans Article 14-1.03. The Contractor shall attach signs labeled "Nesting Bird – Access Prohibited" at least every 50 feet along the fencing. The Contractor shall exclude Project activities to preserve and protect all protective buffer zones, including existing ones, at all times.

- B. In the event that an active nest is discovered by the Qualified Biologist, the Biologist shall immediately notify both the Contractor and the Engineer of the active nest and of the applicable protective buffer zone.
- C. The Qualified Biologist shall inspect all active nesting-bird protective buffer zones(s) on at least a weekly basis until such time as the nest is no longer active as confirmed by the Qualified Biologist. Once a nest is no longer active, the protective buffer zone shall be removed.
- D. The Contractor shall be responsible for any added costs or schedule Delays as a result of the establishment of new nests or of new protective buffer zones due to the Contractor's failure to perform bird exclusion responsibilities.
- E. The Contractor shall monitor protective buffer zone operations during the Project. Requirements for the protection of active nests may vary depending on the location and the species involved. The following are general guidelines to be followed by the Contractor when an active nest is encountered:
 - 1. Stop any activities that may harm the nest.
 - 2. Contact the Engineer immediately.
 - 3. Only the Qualified Biologist should approach the nest and only if necessary.
 - 4. The Contractor shall inform personnel of the presence of an active nest and take steps, described above, to avoid disturbing it.
 - 5. Until inspected by the Engineer or Qualified Biologist, a 20-foot-radius protective buffer zone shall be established around the nest of any non-raptor, ground nesting bird, and a 50-foot-radius protective buffer zone around nests established in shrubs, trees, on structures, on Equipment, etc., except for raptor nests. Furthermore, the protective buffer zone shall be 250 feet for nesting raptors (including hawks), owls and burrowing owls, falcons, eagles, herons, and egrets. The Qualified Biologist may recommend, for approval by the Engineer, modification of these zones.

6. Refer to Section 19. Environmental for additional specific buffer zone requirements.

10.14.05. Exclusion Devices

- A. The Contractor shall install nesting exclusion devices to prevent potential establishment or occurrence of a nest in the Project area during Project activities. The Contractor shall maintain all nesting exclusions devices, including existing ones, throughout the nesting season or until completion of Work in an area makes the devices unnecessary. The Contractor shall be responsible for the maintenance, repair, or replacement of exclusion devices until all of the Work is complete. The Contractor shall remove and dispose of all exclusion devices, including those installed by the District, when Work in the area is complete.
- B. Bird exclusion devices shall be installed during the non-nesting season (generally September 1 through January 14). The Contractor shall obtain favorable review from the Engineer when installing bird exclusion devices during the nesting season (generally January 15 through August 31). At a minimum, all exclusion devices shall be inspected daily by the Contractor and weekly by the Qualified Biologist to ensure integrity of the devices and to prohibit birds from nesting without causing them harm.

10.14.06. Nest Prevention

- A. The Contractor is hereby notified that all areas to be cleared of vegetation may be suitable nesting habitat for migratory birds. The Contractor shall perform all necessary clearing prior to the nesting season if at all possible. If clearing must occur during the nesting season, the Contractor shall obtain prior approval from the Engineer. If vegetation must be cut and maintained to prevent birds from nesting, it must be cut to less than six (6) inches in height and removed.
- B. The Contractor shall inspect and monitor bare areas and gravel areas prior to commencement of the nesting season and as frequently as necessary thereafter and provide deterrence measures if necessary to prevent ground-nesting birds, such as killdeer, from establishing a nest.
- C. Removal of vegetation (trees, shrubs, grasses, and herbaceous plants) shall be limited to areas shown on the Drawings designated for vegetation removal unless approval is obtained from the Engineer to remove vegetation from additional areas. No vegetation shall be trimmed back unnecessarily, including trees and/or shrubs growing near the right of way that overhang onto the worksite. Such overhanging foliage shall be protected and tied back if necessary. Landscaped areas and irrigation systems outside of the construction areas shall be preserved and protected from damage by the Contractor's activities.
- D. Pre-established Vegetation Management Areas: Some areas of vegetation removal, clearing, and eradication may be established and cleared by the District prior to the First Chargeable Day. In these areas, the Contractor shall be responsible for the continued clearing and eradication of all re-sprouts.

10.14.07. Submittals

- A. Submit a résumé of qualifications of the Qualified Biologist for the Engineer's favorable review. The Qualified Biologist's qualifications must meet the minimum requirements as specified for the Qualified Biologist listed in Section 19. Environmental. The résumé shall be submitted and must be favorably reviewed by the Engineer prior to any Work.
- B. Submit migratory bird survey reports to the Engineer within two (2) Days upon completion of the survey and at least two (2) Days prior to commencement of Project related activities.
- C. Submit the Qualified Biologists' training materials for favorable review by the Engineer, prior to presenting bird nesting awareness training to personnel.
- D. Submit to the Engineer no later than 15th Day of each month a monthly report prepared and signed by the Qualified Biologist that documents the activities of the Contractor, including, at a minimum, the status of awareness trainings provided, the installation, maintenance, or removal of any bird exclusion devices or protective buffer zones and their locations and monitoring results, and report the current status of previously documented bird nests.
- E. When requested by the Engineer, maintain and submit a log of weekly documentation (including photo-documentation) of the time, date, condition of the nests, and any nest-prevention actions taken during inspections.
- F. Submit to the Engineer product data for nesting exclusion devices, fencing for protective buffer zones, and any shop Drawings as deemed appropriate by the Engineer.
- G. If the Contractor wishes to modify the dimensions of any protective buffer zone or modify any bird exclusion device, a written proposal of such modification must be submitted and favorably reviewed by the Engineer. The submittal must contain the Qualified Biologist's written justification for the proposed modification and shall include a description of the anticipated effects on the active nest and on nesting birds.

10.15. Other Wildlife and Fish Species

- A. The Contractor shall comply with all regulatory and permit requirements pertaining to other wildlife and fish species as identified in Section 19. Environmental.

10.16. Sensitive Plants and Vegetation

- A. The Contractor shall comply with all regulatory and permit requirements pertaining to sensitive or listed plants and vegetation communities as identified in Section 19. Environmental.

10.17. Proper Pruning Techniques for Woody Vegetation Removal

- A. An International Society of Arboriculture (ISA) Certified Arborist or Tree Worker is to be present at all times during pruning. Contractor shall comply with the following:
 - 1. All pruning shall be in accordance with the most current editions of the Best Management Practices for Pruning (International Society of Arboriculture) and the American National Standard for Tree Care Operations (ANSI booklet Z133.1) and Pruning (ANSI booklet A300).
 - 2. Pruning for clearance: Selectively remove only branches required for passage and movement of construction equipment.
 - 3. Remove stubbed branches at the point of origin, outside the bark branch ridge.
 - 4. No more than 25% of live foliage shall be removed from any tree at any one time (or in a given year).
 - 5. Branch removal or reduction cuts (thinning cuts) are to be employed rather than heading cuts. Trees shall not be topped or headed back.
 - 6. All cuts shall be distal to the branch bark ridge or, if present, the branch collar. The cuts shall be close to but shall not injure the branch collar. All final cuts shall be in one plane, with no torn bark.
 - 7. Pruning cuts larger than 4 inches in diameter, except for dead or stubbed branches, shall be avoided.
 - 8. Pruning operations shall be conducted in a manner that does not damage surrounding understory plants, if present.

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SECTION 11. CONTRACT CLOSEOUT

11.01. Project Completion and Acceptance

11.01.01. Use Before Acceptance

- A. The District has the right to utilize or to place into service any item of Equipment or other usable portion of the Work before Acceptance of the entire Project. The District's exercise of said right shall hereinafter be referred to as Use Before Acceptance.
- B. Where Use Before Acceptance is identified in the Contract Documents, it shall be considered part of the Work; no additional compensation or payment shall be made.
- C. Should the District desire Use Before Acceptance that has not been identified in the Contract Documents, the Engineer shall notify the Contractor in writing, identifying the specific portion or portions of the Work proposed for Use Before Acceptance.
- D. The Contractor shall provide written notice within ten (10) Days after a request for Use Before Acceptance by the District stating whether the proposed portions of Work are suitable for Use Before Acceptance and if there are any associated costs, constraints, or other impacts.
- E. Until Use Before Acceptance, the Contractor is responsible for all care and maintenance of all items or portions of the Work.
- F. Unless the Engineer requires the Contractor to execute a Use Before Acceptance Guaranty as provided in Article 11.02.03. Use Before Acceptance Guarantee, upon the District's issuance of written notice of Use Before Acceptance, the District accepts responsibility for the protection and maintenance of all such items or portions of the Work described in the written notice, with the exception of any injury or damage resulting from the Contractor's actions or from negligence.
- G. If, by reason of the District's unidentified Use Before Acceptance, the premium for the Contractor's bodily injury and property damage insurance is increased, the District shall reimburse the Contractor for the additional amount necessarily incurred, allocable to the area and the period of the District's use up to the date of Acceptance of the Work.
- H. The District's Use Before Acceptance does not constitute Acceptance of the Work, or of any portion of the Work, by the District, nor does it relieve the Contractor of responsibility for correcting defective and/or deficient Work or Material found at any time before Acceptance of the Work or during the guarantee period after the District's Acceptance. Notwithstanding any Use Before Acceptance, the Contractor retains full responsibility for fulfilling all of the requirements of the Contract Documents.

11.01.02. Contractor's Responsibility to Manage Incomplete and Deficient Work

- A. The Contractor is responsible for identifying and managing incomplete and deficient Work. Incomplete and deficient Work includes, but is not limited to, noncompliance items, rework items, and nonconforming tests; deficiencies relating to inspections by the building official; administrative requirements; and items of Work not complete per the Contract.
- B. The preliminary final and final inspections shall not be conducted until:
 - 1. the entire Work of the Milestone/Project is complete;
 - 2. cleaning has occurred pursuant to Standard Provisions Article 11.04. Final Cleaning and to Special Provisions Article 22.06. Final Cleaning; and
 - 3. deficient Work identified in all outstanding noncompliance notices and/or deficiency lists has been corrected.
- C. For each Milestone Completion, the Contractor must include activities for conducting the preliminary final inspection, completion of deficiency list, and final inspection in the Contractor's Detailed Progress Schedules.
- D. The District may withhold the estimated cost of the incomplete and deficient Work and consequences thereof until it is completed in accordance with the requirements of the Contract Documents.

11.01.03. Milestone Completion Preliminary Final Inspection

- A. When the Contractor believes the Work of a Milestone or Project is complete, including final cleaning of the Work area associated with the Milestone, the Contractor shall submit to the Engineer a written certification that the Work of the Milestone is complete and shall request a preliminary final inspection of the work of the Milestone by the District.

- B. Prior to requesting the inspection, the Contractor shall furnish the following Milestone Completion Certification to District:

"To the best of my knowledge, all Work of Milestone (#) has been completed, inspected, and tested and is in full compliance with the requirements of the Contract."

Certified by Contractor: _____ *Date:* _____
(Signature)

- C. Within seven (7) Days of receipt of the Contractor's certification that all Work of a Milestone/Project is complete, the Engineer shall conduct a preliminary final inspection with the Contractor.

- D. If the Engineer determines that, based on the results of the preliminary final inspection, the incomplete/deficient Work identified is greater in substance and/or volume than can be appropriately declared on a Deficiency List, then the Work is not complete enough to complete the preliminary final inspection. The Contractor shall be so notified in writing. The Contractor must complete the Work and reinitiate procedures for another preliminary final inspection. Any costs to the District for more than two (2) preliminary inspections may be charged to the Contractor.
- E. If the results of the preliminary final inspection are satisfactory to the Engineer, a Deficiency List shall be prepared and issued to the Contractor. Neither the District's preparation of the Deficiency List, nor any omission from the Deficiency List of items of incomplete and/or deficient Work relieves the Contractor from completing all the Work required by the Contract.

11.01.04. Milestone Completion Final Inspection

- A. Prior to requesting the milestone completion final inspection, the Contractor shall furnish the following milestone completion certification to the District:

"The work of Milestone (#) has been completed, inspected, and tested and is in full compliance with the requirements of the Contract. All Deficiency List items identified during the Preliminary Final Inspection have been completed."

Certified by Contractor: _____ Date: _____
(Signature)

- B. Upon delivery of this certification to the Engineer and if the Engineer agrees with the Contractor's certification, a final inspection shall occur within ten (10) Days of the Contractor's delivery of the milestone completion certification.
- C. If the Engineer determines the Work is deficient, the Contractor shall again be furnished with a Deficiency List identifying the observed deficiencies in the Work. After all deficiencies have been corrected, the Contractor must initiate procedures for another final inspection. If more than two (2) final inspections are required, any costs to the District for additional final inspections may be charged to the Contractor.
- D. After Acceptance of the Contractor's milestone completion certification following the final inspection, the Engineer shall issue a milestone completion letter to the Contractor. This letter will establish the date of the completion of the milestone. The assessment of Liquidated Damages, if applicable, shall cease accruing as of the date of the milestone completion.
- E. The Contractor's Detailed Progress Schedules must include activities for final inspection of milestones.

11.01.05. Project Completion

- A. The Contractor shall certify that the entire Work of the Project is complete. Completion of the Project includes submission to and acceptance by the District of all milestone completion submittals. Article 22.05. Submission Closeout Items, describes in greater detail the submittal requirements for Contract Closeout.
- B. Prior to the Engineer issuing the Project completion letter, the Contractor shall furnish the following Project completion certification to the District. This certification is in addition to any intermediate Milestone completion certifications:

"The entire Work of the Project has been completed, inspected, and tested and is in full compliance with the requirements of the Contract Documents. All Deficiency List items have been completed. All Deficiency List items have been completed. All items on the rework list have been completed. All Closeout Documents required by Article 22.05. Submission of Closeout Items, have been submitted to and accepted by the Engineer."

Certified by Contractor: _____ Date: _____
(Signature)

- C. The Contractor's certification shall also include the completion of all Deficiency List Work and the correction of all rework.
- D. After acceptance of the Contractor's final certification, the Engineer shall issue a Project completion letter to the Contractor. This letter shall establish the date of the completion of Project. The assessment of Liquidated Damages, if any, shall cease accruing as of the date of Project completion.

11.01.06. Acceptance of Work

- A. After issuing the Project Completion letter, the Engineer shall recommend that the District Board of Directors formally accept the Work.
- B. Acceptance of Work shall be made by the District Board of Directors and only after the Engineer has recommended acceptance.
- C. After the Board of Director's formal Acceptance of Work, the Clerk of the Board shall record a Notice of Completion of Contract and Acceptance of Work.
- D. The District's Acceptance of Work establishes conformity with the Contract except for Delays in completion, latent defects, fraud, or such gross errors as amount to fraud, willful misconduct, or gross negligence, and are subject to any guarantee and warranty, express or implied. Determinations by the Engineer that the Work is complete or Acceptance of Work by the Board of Directors does not bar any action by the District against the Contractor pursuant to Article 11.02. Guarantee and Guaranty Bond.

11.02. Guarantee and Guaranty Bond**11.02.01. Guarantee**

- A. The guarantee period for any item of Equipment or usable portion of the Work that the District utilizes or places into service shall commence on the date of the Notice of Completion of Contract and Acceptance of Work.
- B. The Contractor hereby agrees to make, at its own expense, all repairs or replacements necessitated by defects in Material or workmanship supplied or constructed under the terms of this Contract and to pay for any damage to other Work resulting from such defects that becomes evident within a minimum of three (3) years after the date of Notice of Completion of Contract and Acceptance of Work or within such period of time as may be prescribed by law. The Contractor further assumes responsibility for a similar guarantee for all Work and Materials provided by Subcontractors or by manufacturers of packaged Equipment components. The Contractor also agrees to indemnify, defend, and hold the District harmless from liability of any kind arising from damage due to said defects.
- C. The Contractor-furnished Guarantee and Guaranty Bond specified herein shall be in addition to any Equipment, workmanship or Material warranties specified elsewhere in the Contract or as provided by the manufacturer. The Contractor shall provide copies of all warranties required of the Specifications in addition to the Guarantee and Guaranty Bond.
- D. The Contractor shall execute and submit to the Engineer a completed guaranty form for the Work in the format provided below.
- E. The Contractor shall, upon receipt of notice in writing from the District, promptly make all repairs arising out of defective Materials, workmanship, or Equipment. If the Contractor has failed to make the repairs with due diligence within ten (10) Days after giving this notice to the Contractor, the District is hereby authorized to make such repairs. In case of emergency, where, in the opinion of the District, Delay could cause serious loss or damage, repairs may be made without notice sent to the Contractor. The Contractor and its Surety shall be liable for any expense in connection with repairs performed by the District or by its agents.
- F. Prior to the expiration of the guaranty period, the District reserves the right to hold a meeting and require the attendance of the Contractor and relevant Subcontractors and Suppliers at no cost to the District. The purpose of the meeting is to review guaranties, bonds, and maintenance requirements and to determine the required repair or replacement of defective items.
- G. For the purpose of this Article, Acceptance of the Work or a portion of the Work by the District shall not extinguish any covenant or Agreement on the part of the Contractor to be performed or fulfilled under this Contract that has not, in fact, been performed or fulfilled at the time of such acceptance. All covenants and

agreements shall continue to be binding on the Contractor until they have been fulfilled.

11.02.02. Guaranty Bond

- A. The Contractor shall furnish a written guaranty bond in the format provided below prior to issuance of the Project Completion letter. The guaranty bond shall be executed by both the Contractor and the surety (who must be an admitted surety in accordance with California Code of Civil Procedure Section 995.670). This guaranty bond shall be for a period of three (3) years after the date of Notice of Completion of Contract and Acceptance of Work and shall cover all Work.
- B. The amount of the guaranty bond shall be no less than 15 percent of the total Contract Price(s).

SANTA CLARA VALLEY WATER DISTRICT**GUARANTY FORM****Guarantee for****(Project Name and Project Number)****City, State**

We hereby guarantee the Project commonly known as _____ has been completed in accordance with the requirements of the Contract Documents and further agree that the Work to be free of defects in workmanship, Materials, and Equipment and to remain free of such defects for a period of three (3) years from the date of Acceptance of Work by the District's Board of Directors.

We agree that if any defects in Materials, workmanship, or Equipment become evident, we shall, within ten (10) Days after written notice of such defects, commence to repair or replace the same together with any other Work that may be damaged or displaced in so doing.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time after being notified, or should the emergencies of the case require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the Santa Clara Valley Water District to proceed to have the defect repaired and made good at our expense; we shall pay the cost therefor upon demand.

The Guaranty provided herein shall not be in lieu of, but shall be in addition to, any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Contractor: _____

Signature: _____

Title: _____

Date: _____

**SANTA CLARA VALLEY WATER DISTRICT
GUARANTY BOND**

BE IT KNOWN BY THESE PRESENTS: That

WHEREAS, the Santa Clara Valley Water District, State of California, has awarded to _____ (hereinafter designated as "Principal") a Contract for _____; and

WHEREAS, said Principal is required under the terms of said Contract to furnish a Guaranty Bond for the faithful performance of said Contract's Guaranty.

NOW, THEREFORE, we, the Principal and

_____ as Surety, are held and firmly bound unto the Santa Clara Valley Water District (hereinafter called "District") in the sum of

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

THE CONDITION OF THIS OBLIGATION IS SUCH that if the above Principal, or heirs, executors, administrators, successors, or assigns shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the said Contract and any alteration thereof made as therein provided, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the District, its officers, agents, and employees, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

And the said 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 to the Specifications accompanying the same shall in any way affect its obligation on this bond, and does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the Work or to the Specifications.

In the event suit is brought upon this bond by the District and judgment is recovered, Surety shall pay all costs incurred by the District in such suit, including a reasonable attorney's fee to be fixed by the Court.

IN WITNESS WHEREOF two identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ Day of _____, 2_____.

_____ (Seal)	_____ (Seal)
_____ (Seal)	_____ (Seal)
_____ (Seal)	_____ (Seal)
<i>Principal</i>	<i>Surety</i>

Address: _____

NOTE: Signature of those executing for Surety must be properly acknowledged.

11.02.03. Use Before Acceptance Guarantee

- A. For Equipment or components of Equipment or other usable portions of the Work utilized or placed into service for the District's benefit during the progress of the Work and prior to Acceptance of Work, the Contractor shall submit the guarantee/warranty certificate below on the Contractor's letterhead.

(Contractor's Letterhead)

USE BEFORE ACCEPTANCE GUARANTY

FOR

EQUIPMENT OR OTHER USABLE PORTION OF THE WORK INSTALLED BY
CONTRACTOR

AND

USED BY DISTRICT BEFORE ACCEPTANCE OF WORK

We (Name of Contractor), agree to maintain and repair as recommended by the manufacturer the following described Equipment (system) or other usable portion of the Work that has been utilized or placed into service by the personnel of the District prior to Acceptance of Work. The Guaranty provided herein shall not be in lieu of, but shall be in addition to, any warranties, performance bond, payment bond, or other obligations otherwise imposed by the Contract Documents and by law.

Owner: Santa Clara Valley Water District

Description of Equipment or other portion of the Work: _____ (Include manufacturer name, model number, serial number, and such other information as needed to positively identify the Equipment/system or portion of Work.)

Location of Equipment: _____

Installed under: (Contract Number and Contract Title)

Date Installed: _____

Date of first utilization or placement into service by the District: _____

This guaranty/warranty is effective upon date shown herein under, and shall remain effective until the District's Acceptance of Work.

Name of Contractor: _____

By: _____

Address: _____

Phone: _____

License No. _____

Date: _____

11.03. Submission of Closeout Items**11.03.01. As-Built Drawings**

- A. At completion of construction and prior to issuance of the Project Completion letter by the District, the Contractor shall deliver the following documents to the Engineer in the following form:
 - 1. One original set of As-Built Drawings.
 - 2. Field Test Records (two [2] copies): Unless required to be submitted elsewhere in the Specifications, field test records shall be submitted as a closeout item bound into three ring vinyl binders with clear plastic spine label pockets with all pages numbered. A complete, neat, word processed table of contents for each binder with page numbers for each entry must be provided.
 - 3. Field survey record documentation.
- B. Accompany the closeout document submittal with a transmittal letter in duplicate containing the following:
 - 1. Date.
 - 2. Santa Clara Valley Water District Project name and Project number.
 - 3. Contractor's name and address.
 - 4. Title and number of each document.
 - 5. Certification that each document as submitted is complete and accurate.
 - 6. Signature of Contractor.

11.03.02. Closeout Documents

- A. At completion of construction and prior to the issuance of the Project Completion Letter by the District, the Contractor shall deliver the following closeout documents to the Engineer:
 - 1. Evidence of compliance with and approval of Contractor obtained permits and associated inspections of authorities issuing the permits.
 - 2. Copies of all special guarantees, warranties, and bonds.
 - 3. Evidence of release of all liens and stop-payment notices.
 - 4. Release of Claims in accordance with Article 6.03. Final Payment.

5. Records indicating the District's receipt and acceptance of all tools, spare parts, and extra Material as specified in these Specifications.
6. Records indicating the District's receipt and acceptance of all O&M manuals as specified in these Specifications.
7. Any and all administrative paperwork required for closeout.

11.03.03. Keys

- A. The Contractor shall turn over all keys to new and existing facilities to the Engineer. This includes keys that were loaned (if any) to Contractor staff by the District for use during the construction period. The Contractor shall provide a written description or schedule describing which keys correspond to which doors, gates, or other feature.

11.04. Final Cleaning**11.04.01. Scope and Schedule for Final Cleaning**

- A. Final cleaning is separate Work from cleaning done throughout the Project to maintain the Project site in a safe and presentable condition. Final cleaning shall be a comprehensive cleanup of all new and existing facilities affected by the Work prior to and finished within 30 Days of the District's approval for continuous use and occupancy. Final cleaning may be performed separately by structure or area at different time periods only if approved by the Engineer.
- B. Completion of this Work shall be planned and scheduled to accommodate the operational requirements of this District facility.

11.04.02. Final Cleanup

- A. Before final inspection, the Contractor shall clean the premises and, unless otherwise specified, remove from the worksite and areas adjacent to the worksite, all building Material, rubbish, debris, unused Material, concrete forms, falsework, temporary structures, and other Material and Equipment used during the construction. All parts of the Work shall be left in a neat and presentable condition to the satisfaction of the Engineer.

11.04.03. Structures

- A. Structures shall have the interiors and exterior surfaces cleaned by a professional industrial janitorial service fully knowledgeable in proper and effective cleaning methods.
- B. The structures shall be thoroughly cleaned and shall include, but shall not be limited to, the following cleaning activities:
 1. Paint, glazing compounds, and other Material shall be removed from glazing and skylights. Glazing and skylights shall be washed and

polished on both sides. Care shall be exercised so that the glazing is not scratched or damaged.

2. Interior surfaces, including walls, ceilings, light fixtures, doors, jambs, sills, piping, ducts, Equipment, electrical panels and conduits, handrails, guardrails, gratings, pipe trenches, drains, and miscellaneous fixtures shall be cleaned. Stains, spots, dirt, and dust shall be removed.
 3. Temporary floor protections shall be removed; floors shall be vacuumed and washed; floors other than concrete shall be waxed and buffed.
 4. Door and window hardware shall be cleaned and polished after all traces of stains, dirt, paints, and blemishes are removed.
 5. Casework and plastic laminate surfaces shall be cleaned and polished.
 6. Marks, stains, fingerprints, soil, and blemishes shall be removed from painted, decorated, or stained interior surfaces.
 7. Spots, soil, paint, grout, plaster, concrete, and similar substances shall be removed from tile and the tile shall be washed.
 8. Exterior walls, doors, and louvers shall be washed.
 9. All interior and exterior signage shall be cleaned.
- C. All concrete decks and floors shall be swept and washed. Stains, including oil stains, metal rust, and weld splatter shall be removed. Spills of construction Materials, including paint, concrete, grout, adhesives, insulating Materials, chemicals, and similar Materials shall be removed and the underlying surfaces cleaned.

11.04.04. Streets, Roadways, Concrete Slabs, Sidewalks, and Paved Areas

- A. Streets, roadways, concrete slabs, sidewalks, and paved areas shall be cleaned and pressure washed so that they are free of debris, soil, and paint or construction Material spills. Painted construction markings on concrete and pavement shall be removed.
- B. All access roads and maintenance roads shall be graded, removing wheel tracks and smoothing up such roads, and restored to their specified condition, or if none specified, to the condition then existing prior to the start of construction.

11.04.05. Storm Drainage Facilities

- A. All gutters, V ditches, swales, storm drain pipe inlets, catch basins, drop inlets, and manholes shall be cleaned of soil, vegetation, and debris.

11.04.06. Unpaved Areas

- A. Unpaved areas between new facilities and between new and existing facilities shall be cleaned of all debris and construction Material. These areas shall be graded or raked to a smooth uniform surface without leaving holes, depressions, or tire tracks.

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SPECIAL PROVISIONS

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SPECIAL PROVISIONS

SECTION 12. WORK AND CONTRACT TIME(S)

12.01. Summary of Work

- A. The Work to be completed under this Contract shall consist of furnishing all tools, Equipment, Material, supplies, and manufactured articles, and all labor, transportation and services, including fuel, power, water, and essential communications, and of performing all Work or other operations required to construct the Pacheco Pumping Plant Priority 1 Fire Alarm and Suppression System Improvements Project as required on the Plans, Appendix E, and these Specifications. Any quantities provided with Article 12.01. Summary of Work are approximate. Should there be a discrepancy between the quantities included herein and elsewhere in the Contract documents, those quantities specified elsewhere on the Contract shall govern.
- B. The Work includes, but is not limited to, the following:
 - 1. Demolish, remove, dispose of and/or abandon in place the existing fire control;
 - 2. Core Drilling;
 - 3. Furnish, install and test approximately 300 linear feet of 4-inch diameter Mechanical pipeline and associated appurtenances;
 - 4. Addition of a clean agent fire suppression system in the Adjustable Speed Control Gallery.
 - 5. A new fire alarm system for the main facility building, in conjunction with the clean agent fire suppression system and the existing water-based fire suppression system, consisting of the following components:
 - a. A "VESDA" (Very Early Smoke Detection Apparatus) type smoke detection system, which shall activate horns and strobes throughout the Pacheco Pumping Plant (PPP), as well as send a distinct signal to the fire alarm monitoring central station, currently monitored by Cosco Fire Protection, Inc., and sends a distinct signal through the District's Raw Water communications system, monitored at the District's Rinconada Water Treatment Plant in Los Gatos, CA.
 - (1) Addressable smoke detectors for the Adjustable Speed Control Gallery, including replacement of the existing underfloor smoke detectors.
 - (2) Addressable manual pull-stations within the Adjustable Speed Control Gallery.

- (3) Addressable heat detectors to protect the hydraulic oil system in main pump room.
 - (4) Addressable heat detectors to protect the outdoor PPP transformers.
 - (5) Addressable smoke detectors located above the electrical panels in the pump gallery.
 - (6) Addressable manual pull-stations throughout the main facility building.
 - (7) Addressable water flow switch at facility fire pump.
 - (8) Fire Pump controller signals to indicate pump status and tamper switch alarm.
- 6. New fire department standpipe connection to the existing firefighting system to allow the fire department to boost firefighting system pressure if desired.
 - 7. Retrofitted fire hose nozzles which are specifically approved for use near electrical equipment, which do not have the capability of being adjusted to a straight stream.
 - 8. Signage for exiting
 - 9. Emergency Lighting

12.02. Drawings

- A. The attached Drawings accompany these Specifications and are made a part thereof.

Sheet Code	Sheet Description	Page No.
General		
G-01	Title Sheet, Location and Vicinity Maps	1 of 14
G-02	Drawing Index, General Notes, and Legend	2 of 14
G-03	Abbreviations	3 of 14
G-04	Site Plan and Site Access	4 of 14
Mechanical		
M-01	Fire Protection System Plan	5 of 14
M-02	HVAC Modifications	6 of 14
M-03	System Schematic, Section, and Details	7 of 14
Electrical		
E-01	Abbreviations, Legend and Notes	8 of 14

Sheet Code	Sheet Description	Page No.
E-02	Fire Alarm Block Diagram	9 of 14
E-03	Main Structure Single Line, Panelboard and Ltg Schedule	10 of 14
E-04	Main Structure (Basement) Fire Alarm System and Exit Lighting	11 of 14
E-05	Main Structure (Basement) Fire Alarm HVAC Duct Detectors	12 of 14
E-06	Main Structure (Crawl Space) Fire Alarm System	13 of 14
E-07	Main Structure Fire Alarm Mezzanine Level	14 of 14

12.03. Contract Time(s)

- A. The Contractor shall complete all Work required under this Contract before the expiration of **250** Days from the first chargeable Day of the Contract. The first chargeable Day of the Contract shall be defined in the NTP issued by the District.
- B. No extension of time shall be given because of rain, or because of results of rain, except set forth in these Specifications.
- C. Work shall include the following Milestones:
 - 1. Milestone 1: Completion of all work required to prepare and mobilize for construction Project activities and receive favorable reviews of the immediate submittals shall be completed within **15** Days from the first chargeable Day of the Contract.
 - 2. Milestone 2: Completion of demolition and core Drilling within **60** Days from the first chargeable Day of the Contract.
 - 3. Milestone 3: Completion of all work required to install Mechanical Pipe, replace Transfer Grille and Fire Damper, install Conduit, install Wire, install Sensors, strobes, and Detectors, replace Exist Lighting, install Clean Agent within **175** Days from the first chargeable Day of the Contract.
 - 4. Milestone 4: Completion of testing and signage within **225** Days from the first chargeable Day of the Contract.
 - 5. Milestone 5: Completion of all work required to close-out the Project, including, but not limited to, full system testing, demobilization, record drawings, O&M documents, Punchlist etc. **250** Days from the first chargeable Day of the Contract.
- D. See Special Provisions Article 12.05. Liquidated Damages regarding assessments.

12.04. Inclement Weather

- A. The time allowance for completion of Work is based upon the inclusion of 6 Days for inclement weather, which, pursuant to Standard Provisions Article 3.08.02. Inclement Weather, may be excusable.
- B. The Contractor shall comply with Standard Provisions Article 3.08.02. Inclement Weather.

12.05. Liquidated Damages

- A. In accordance with Standard Provisions Article 5.07. Liquidated Damages, the District may assess as Liquidated Damages the following amounts:
 - 1. \$2,400 per Day for failure to complete all Work of Milestone 1 within the time limit allowed.
 - 2. \$6,800 per Day for failure to complete all Work of Milestone 2 within the time limit allowed.
 - 3. \$6,800 per Day for failure to complete all Work of Milestone 3 within the time limit allowed.
 - 4. \$6,800 per Day for failure to complete all Work of Milestone 4 within the time limit allowed.
 - 5. \$3,300 per Day for failure to complete all Work of Milestone 5 within the time limit allowed.
 - 6. \$200 per Day to submit the Operations and Maintenance Manuals within the time limits allowed.

12.06. Bonus

- A. No Special Requirements.

12.07. Changes

- A. Contractor's attention is directed to Standard Provisions, Article 3.07, Change in Contract Price(s).

SECTION 13. GENERAL REQUIREMENTS

13.01. Abbreviations and Acronyms

- A. In addition to the abbreviations provided under Section 1 of the Standard Provisions, the following abbreviations and acronyms shall apply for this Project:

AASHTO	American Association of State Highway and Transportation Officials
ARV	Air Release Valve or Combination Air/Vacuum Valve
ASME	American Society of Mechanical Engineers
AWWA	American Water Work Association
BAAQMD	Bay Area Air Quality Management District
BFV	Butterfly Valve
BMP	Best Management Practices
BV	Ball Valve
CalFire	California Department of Forestry and Fire Protection
Cal OSHA	California Department of Industrial Relations Division of Occupational Safety and Health
CDFG	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
FCA	Flange Coupling Adapter
FCD	First Chargeable Date
GV	Gate Valve
MMRP	Mitigation, Monitoring & Reporting Program
MND	Mitigated Negative Declaration
NPDES	National Pollutant Discharge Elimination System
NTP	Notice to Proceed
RWQCB	Regional Water Quality Control Board
SCC	Santa Clara Conduit
SFP	San Felipe Pipeline
SSPC	Steel Structure Painting Council
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
USBR	United States Bureau of Reclamation
Valley Water	Santa Clara Valley Water District

13.02. Definition of Key Terms

- A. **Unscheduled Operational Facility Shutdown:** Operational Facility Shutdowns initiated by or due to action by the Contractor that are beyond that anticipated or allowed in the Contract. Causes of unscheduled shutdowns could include, but are not limited to, actions causing a power outage; contaminating water such that State water quality regulations are violated or are in imminent danger of violation; and impeding chemical feed systems, water quality monitoring, or process operations.

- B. Operational: To be considered Operational, a facility or facility component must be functional in all manners intended for its use at its rated capacity and through its entire operation range. Operational facilities may require transmission facilities, storage facilities, process facilities, and support systems (e.g., chemicals, water, power, communication) to be fully functional and accessible. For a new facility to be considered operational, it must be installed, tested, and District personnel must have received specified training by the Contractor in the facility's operation and maintenance.
- C. Continuous Operation: A completed system operating continuously, 24 hours a Day, without interruption, and without the need for intervention other than normal Operational adjustments by the District's operating personnel.
- D. Project Completion: Project Completion is the stage at which the work of the entire Project is complete per the Contract documents, and the Engineer has performed the final inspection and issued a Project Completion Letter.

13.03. Site Investigation

- A. The Contractor shall not be entitled to any adjustment in the Contract Price(s) or in Contract Time(s) if the existence of the condition that caused the alleged impact:
 - 1. could have been reasonably discovered or revealed as a result of examination, investigation, exploration, test, or study of the site and of contiguous areas required by the Contract Documents to be conducted by or for the Contractor prior to commencing the Work; or
 - 2. could have been inferred from the presence of other visible features, such as buildings, meters, and junction boxes on or adjacent to the site.

13.04. District-Furnished Reports**13.04.01. Geotechnical Reports**

- A. No Special Requirements.

13.04.02. Environmental Report

- A. The Santa Clara Valley Water District has prepared a Notice of Exemption, see Appendix B.

13.04.03. Hazardous Material Investigation Report

- A. No Special Requirements.

13.04.04. Cultural Resources Report

- A. No Special Requirements.

13.04.05. As-Built Documents

- A. The as-built or record documents referenced represent the District's knowledge of the existing facilities relevant to the planned Work areas for the Project. The as-built or record documents are for reference only; the District does not guarantee their completeness or correctness. The District makes no representation, either expressed or implied, that the conditions indicated in the Drawings, documents, or records are representative of those existing at the Site, or that different conditions may not occur or Material other than that indicated or in proportions different from those indicated may not be encountered.
- B. The as-built Drawings are available by request to the Engineer in electronic (PDF) format only; **due to the County of Santa Clara Health Officer's Order of DATE, the District offices remain closed to the public until further notice.**
 - 1. "Map and Construction Plan for Pacheco Pumping Plant Regulating Tank Project Phase A Relining & Recoating", dated August 2009.
 - 2. "Map and Construction Plan for Pacheco Pumping Plant ASD Replacement Project Volume 2", dated June 2014.
 - 3. "Solicitation/Specification 3-SB-20-00150/DC-7530 Pacheco Pumping Plant and Substation Drawings Volume 3", dated October 1982.
- C. Requirements for the Contractor to field-verify existing conditions are as specified in the Contract Documents.
- D. Other subsequent, undocumented improvements may also be present and would not be reflected in the as-built or record documents. Contractor's overall understanding shall be based on the Drawings and on a reasonable understanding of the facilities from a general field inspection.
- E. CAD files of the Drawings and Specifications will not be provided to the Contractor. The Contractor may request PDF copies of Drawings. If the Contractor uses the Drawings for any other purpose except as-builts for the Project, all title block information and authors of the Drawings shall be removed.

13.05. Contractor's Engineering and Design

- A. The Contractor shall provide engineering and design of the following Work components:
 - 1. Anchorage of mechanical and electrical Equipment.
 - 2. Other structures or items as specified herein or as indicated on the Drawings.
- B. See Technical Provisions for additional information.

13.05.01. Seismic Design Criteria

- A. Non-structural components to be furnished under this Contract shall be designed, constructed, and installed in accordance with the design criteria listed below.
- B. General Design Criteria
 - 1. CBC 2013 California Building Code 2013
 - 2. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
 - 3. ACI 318 Building Code Requirements for Structural Concrete
 - 4. AWS D1.1, D1.3 and D1.4, Structural Welding Code
- C. Seismic Design Criteria
 - 1. For Non-Structural Components (architectural, mechanical, and electrical items permanently attached to and supported by a structure)
 - a. Design Spectral Response Acceleration for Short Period:
SDS = (See information provided on S-1)
 - b. Component Importance Factor: $I_p = 1.0$
 - c. Seismic Design Category: D
- D. Design in accordance with the current edition of the California Building Code (CBC) or with applicable, site-specific seismic criteria herein, whichever is more stringent.

13.05.02. Wind Design Criteria

- A. No Special Requirements.

13.05.03. Hydraulic Design Criteria

- A. No Special Requirements.

13.05.04. Truck Loading

- A. No Special Requirements.

SECTION 14. SPECIAL REQUIREMENTS

14.01. Engineer

- A. The Designated Engineer of the District shall be the District's representative who assumes all duties and responsibility and has all rights and authority as assigned in the Contract Documents in connection with completion of the work in accordance with the Contract Documents.
- B. The Designated Engineer is the Deputy Operating Officer of the Water Utility Capital Division.

14.02. Project Signs

- A. No Special Requirements.

14.03. Office Facilities

14.03.01 Engineer's Office

- A. The Contractor shall provide and maintain office facilities as described for the exclusive use of the Engineer and of representatives of the Engineer. The location and condition of the office facilities shall be as approved by the Engineer. The Contractor shall furnish weekly janitorial services in connection with the office for the duration of the Work.
- B. Office facilities and furniture shall be clean and in good condition, consistent with common professional offices, and shall be approved by the Engineer.
- C. The Contractor shall provide a broadband Internet service connection for the exclusive use of the District's Engineer and of authorized representatives.
 - 1. Broadband Internet Service
 - a. Broadband connection shall meet the definition of the U.S. Federal Commission as any connection to the Internet with a minimum download speed of five (5) MB/s and minimum upload speed of one (1) MB/s or faster in at least one (1) direction.
 - b. The broadband connection shall consist of any of the following technologies:
 - (1) Digital subscriber line (DSL), which uses copper telephone lines to carry voice traffic and high-speed data.
 - (2) Cable modems, which tap into existing cable television company lines.

- (3) Wireless, which is typically made up of on-the-ground, antenna-to-antenna systems, commonly called “fix-wireless” systems.
 - (4) Satellite, which is provided by direct broadcast satellite (DBS) companies focusing only on Internet connections.
 - c. The service connection shall include all necessary software and hardware, such as Ethernet cards and modems, and will be compatible with latest supported Microsoft Windows operating system.
- D. The building or trailer shall be specifically designed for office facilities and shall not be less than 12 feet x 40 feet in the plan, with side walls not less than 8 feet high. The office shall have sufficient space for weekly and other conferences for up to 10 people to be held.
- E. The Contractor shall furnish and install two (2) tables or counters for use in viewing Drawings; one (1) desk with a top dimension of not less than 4 feet x 2.5 feet each; three (3) swivel chairs; one (1) wall-mounted, underwriter-laboratory-approved fire extinguisher 10# (ABC type); one (1) 16-unit first aid kit (the contents replenished as used); and two (2) two-drawer legal-size file cabinet. Adequate heat, light, electricity, and ventilation, including air conditioning, hot and cold drinking water, private telephone (three [3] lines) with a phone-answering system for messages, broadband Internet services, and a printer/ scanner/ copier shall be provided.
- F. The office trailer shall be insulated and of weather-tight construction. The trailer shall be rigidly mounted and level. Stairs with a landing at floor level and guardrails shall be provided for two (2) entrance doors, each complete with deadbolt locksets. All locksets shall be keyed alike and ten (10) keys shall be provided. The door closest to the conference room shall be provided with a ramp with a slope of no greater than a 1-foot rise to a 12-foot run, landing, and conforming to the CBC and Americans with Disabilities Act (ADA) requirements for access. Ground surfaces within 20 feet of each trailer shall be either paved or covered with six (6) inches of Class 2, aggregate-base rock compacted to 90 percent relative compaction overlying high-modulus, woven, and soil-separation geotextile. Surrounding surfaces shall be sloped to drain away from the trailer.
- G. The Contractor shall provide electrical service of sufficient capacity for all loads to the office trailers, including an adequate disconnect switch and circuit breaker panel located inside the trailer. At least one (1) grounded 120-volt electrical receptacle shall be installed on the walls of each room with a maximum spacing between receptacles of eight (8) feet.
- H. The Contractor shall clean the Engineer’s office on a regular basis, at least weekly, for the duration of the Work. Cleaning shall include emptying waste receptacles, vacuuming and mopping floors, dusting, cleaning the toilet room, and washing windows. The Contractor shall furnish weekly janitorial services in

connection with the office for the duration of the Work. The Contractor shall also provide pest control as required during the Work.

14.03.02. Contractor's Office

- A. The Contractor shall provide and maintain at the project site a suitable trailer office for Contractor's use. Location of Contractor and sub-contractor office trailers shall be at one of the Contractor's staging area shown on the Drawings and shall be as approved by the Engineer. At this office shall be kept project copies of the Contract Documents, project progress records, project schedule, submittals, and other relevant documents which shall be accessible to the Engineer, representatives of the District's Construction Management Consulting firm and other District representatives during normal working hours. Contractor's office shall have sufficient space for weekly and other conferences for up to 15 people to be held.

14.03.03. Removal and Disposal

- A. Office facilities, furnishings, and/or Equipment specified in this Special Provisions Article 14.03. Office Facilities shall be furnished, installed, and in operating condition prior to performing any other Contract Work under the Contract.
- B. Prior to issuance of the Project Completion letter by the District, the Contractor shall remove and dispose of its temporary facilities, Material, and Equipment and restore the site to its original or better condition.

14.03.04. Payment

- A. Full compensation for doing all Work necessary to provide office facilities, including operating and maintenance costs as specified herein, shall be included in the lump sum price Bid for mobilization.

14.04. Use of District Facilities

- A. The Contractor's employees shall not use District restrooms, offices, lunchrooms, parking spaces, Work rooms, or similar facilities.
- B. For Work at Pacheco Pumping Plant, the Contractor may be allowed to use existing control building freight elevators only in coordination with District use.
- C. The Contractor shall not be allowed to use any other District Equipment in the facility, including cranes, forklifts, and manlifts.

14.05. Temporary Utilities

- A. Temporary Electrical Power: All electrical power for the Contractor's construction operations, offices, storage spaces, lighting, testing, heating, cooling, ventilating, and security and to support other temporary utilities and facilities described herein shall be provided and paid for by the Contractor. The Contractor shall

arrange with the Local electrical utility, at no additional cost to the District, the provision and removal of adequate, temporary electrical service and/or the provision of a temporary electrical generator. The location of the temporary electrical service Equipment will be subject to the approval of the Engineer.

- B. Temporary Lighting: The Contractor shall provide temporary lighting in all Work areas sufficient to maintain a lighting level during working hours not less than the lighting level required by Cal OSHA standards. As permanent lighting facilities are completed, these may be used in lieu of temporary facilities, provided, however, that bulbs, lamps, or tubes of such facilities used by the Contractor are replaced immediately prior to final Acceptance of the work. All temporary exterior lighting shall be shielded and directed downward and toward the interior of the treatment plant to minimize its effects on treatment plant neighbors.
- C. Temporary Heating, Cooling, and Ventilation: The Contractor shall provide means for heating, cooling, and ventilating all Work areas as may be required to protect the Work from damage by freezing, high temperatures, and weather or to provide a safe environment for workers. Unvented, direct-fired heaters shall not be used in areas where freshly placed concrete will be exposed to the combustion gases until at least two (2) hours after the concrete has attained its initial set.
- D. Temporary Water: The Contractor shall (i) pay for and construct facilities necessary to furnish potable water for human consumption and non-potable water for use during construction; (ii) provide backflow-prevention devices properly sized for use on the metered, potable water connection; and (c) post ample signs throughout the Work area warning of the usage of non-potable water if non-potable water is being used.
- E. Temporary Sanitary Facilities: Sanitary facilities for the Contractor and all Subcontractors shall be provided by the Contractor. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view wherever possible. At least one (1) toilet shall be provided for every 20 workers.
- F. Solid and Liquid Waste Disposal: The Contractor shall provide a sufficient number of waste receptacles, dumpsters, and bins to contain all solid and liquid waste generated from construction operations. Existing waste receptacles owned by the District shall not be used by the Contractor. Waste receptacles shall be emptied weekly at a minimum and more frequently when full.
- G. Temporary Fire Protection: The Contractor shall provide portable, UL-rated, 20#, Class-A fire extinguishers at temporary Contractor, Engineer, and similar office spaces. In all other areas of construction operations, provide UL-rated, 20# or larger, Class-ABC, dry-chemical extinguishers or a combination of NFPA-recommended classes for the exposure. Comply with NFPA 10 and 241 for classification, extinguishing agent, and size required by location and class of fire exposure. Comply with the Uniform Fire Code and Cal OSHA regulations for the number of fire extinguishers.

- H. Temporary Propane Service: If required for construction operations and temporary facilities, the Contractor shall arrange with a Local propane vendor, at the Contractor's own cost, to provide adequate, temporary propane service. The Contractor shall also obtain and pay for all required permits and fees from authorities having jurisdiction. The Contractor shall pay all charges from the utility or vendor, including charges associated with the removal of the service at the end of the Work. The location of the temporary propane service Equipment shall be mutually agreeable to the Contractor and to the Engineer. The Contractor shall provide all gas distribution system piping, regulators, and other incidentals necessary for safe service. Comply with NFPA 54, 55, and 58 as applicable to this Work.
- I. Temporary Compressed Air: The Contractor shall provide compressors for compressed air for construction operations as required. Use of existing or new plant air compressor systems for construction operations is prohibited.

14.05.01. Payment

- A. Full compensation for doing all Work necessary to provide temporary utilities shall be included in the lump sum price Bid for mobilization.

14.06. Staging Area

- A. As shown on the Drawings, the District has a construction staging area.
- B. The Contractor shall be responsible for locating and procuring, at no additional cost to the District, any additional staging areas required for the Project.
- C. Staging areas that are not already paved or covered with compacted aggregate base and that are used for parking vehicles and trailers; or for workshops, maintenance areas, Equipment, piping, formwork, rebar; or for storing masonry on pallets and metal product storage shall be graded, as required, and surfaced with a minimum of three (3) inches of compacted, aggregate-base rock over a high-modulus, woven, soil-separation geotextile. Areas storing aggregate base or other rock products shall also be placed on this same geotextile. The objective is to maintain separation between native and construction Material. Areas storing soils and sand are not required to be surfaced with aggregate-base course.
- D. Aggregate base shall be removed from all staging areas prior to Project Completion; surfaces shall be regraded to their original grades or to matching surrounding conditions as directed by the Engineer.
- E. Any soils contaminated with petroleum product or other Hazardous Material by the Contractor shall be removed by the Contractor and disposed of in accordance with Federal, State, and Local laws.
- F. The Contractor is responsible for weed control in staging and Material storage areas.

14.06.01. Payment

- A. Full compensation for doing all Work necessary to provide staging areas as specified herein shall be included in the lump sum price Bid for mobilization.

14.07. District-Furnished Material and Equipment

- A. No Special Requirements.

14.07.01. Assignment of Contract for District-Procured Material

- A. No Special Requirements.

14.08. Salvaged Material and Equipment

- A. No Special Requirements.

14.09. Tools and Spare Parts

- A. The Contractor shall furnish special tools and spare parts specified in the Technical Provisions, or at a minimum, all special tools and spare parts recommended by the manufacturer for normal operation and maintenance of Equipment. This includes special tools, instruments, accessories required for proper "in-plant" adjustment, maintenance, overhaul, and operation. Tools shall be high-grade, smooth, forged, alloy tool steel, or non-sparking Material as is appropriate.
- B. Special tools are considered to be those tools that, because of their limited use, are not normally available but that are necessary for the particular Equipment, whether identified in the manufacturer's standard manual or not.
- C. The Contractor shall collect and store all spare parts required. All spare parts shall be carefully packed in sealed, weather-resistant cartons and all tools packed in metal toolboxes with locking clasps, each labeled with indelible markings, and shall be adequately treated for a minimum five (5)-year period of storage. Complete ordering information, including manufacturer's name and address; part ordering information, including manufacturer, part number, part name, and Equipment name and number(s) for which the part is to be used shall be supplied with the required spare parts. A list of spare parts, respectively, shall be placed in each storage container and a duplicate list included with the O&M manuals.
- D. Unless otherwise specified or approved by the Engineer, tools and spare parts shall be transferred to the District at the end of Project. The Contractor is responsible for the tools and spare parts until such time as accepted by the Engineer. Upon collection of all required tools and spare parts, as verified by the Engineer, the Contractor shall turn over all tools and spare parts to the Engineer with a complete inventory list. The inventory list shall include a description of all spare parts, the Equipment they are associated with, the applicable Specification

sections, the name and address of the supplier, and the delivered cost of each item. Copies of the actual invoice for each item shall be furnished with inventory to substantiate the delivery.

- E. Special tools and spare parts shall be new and shall not be utilized by the Contractor.

14.10. Operation and Maintenance Documents

14.10.01. Scope of Work

- A. The Work specified in this Special Provisions Article includes providing operation and maintenance (O&M) documents as specified herein.
- B. O&M documents shall include the O&M manual for the complete system and/or the Equipment maintenance data for pieces of Equipment that operate on its own or as part of the complete system. The Equipment maintenance data for each piece of Equipment shall include booklets, literature, cut sheets, and any instructions that are packed with the Equipment. The Contractor shall include information on all motors supplied with Equipment and complete Equipment maintenance summary sheets for every piece of Equipment and instrumentation with an Equipment number or tag number as specified herein.

14.10.02. Submittal Schedule

- A. The Contractor shall submit Draft and Final O&M documents as required below in accordance with Section 7. Submittal Management.
- B. The Draft O&M documents shall be submitted only after a favorable review of the shop Drawings.
- C. Draft O&M documents shall be favorably reviewed at least 3 weeks prior to:
 - 1. Functional Testing; and
 - 2. training on each piece of Equipment or system.
- D. Make two (2) copies of draft O&M documents available at the Project site for use by construction personnel and by the District.
- E. Make additions and revisions to the O&M documents in accordance with the Engineer's review comments.
- F. Final O&M documents shall be favorably reviewed within four (4) weeks after operator training (if applicable) or after final approval of Equipment installation.
- G. Reference is made to Article 12.05. Liquidated Damages for failure to submit O&M documents as required.

14.10.03. Document Contents

- A. Contents for each unit of Equipment and system as appropriate.
 - 1. Description of unit and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - d. A listing of all Equipment and their weights for all items weighing more than 100 pounds. A motor and speed reducer mounted on a common base shall be considered both individually and together in the listing. Other similar assemblies shall be similarly considered.
 - 2. Operating Procedures
 - a. Start-up, break in, routine, and normal operating instructions.
 - b. Regulation, control, stopping, shutdown, and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.
 - 3. Maintenance Procedures
 - a. Routine and preventative maintenance operations.
 - b. Guide to "troubleshooting."
 - c. Disassembly, repair, and assembly.
 - d. Alignment, adjusting, and checking.
 - 4. Servicing and Lubrication Schedule: List of lubricants required, including time intervals for lubrication, adjustments, etc., on all new Equipment furnished under this Contract and a list of all required lubricants, including a notation as to lubricant used initially in each item of Equipment. For each required lubricant, a list of acceptable equivalents from at least one (1) different major manufacturer whose products are locally available near the Project site shall be provided.
 - 5. Manufacturer's printed operating and maintenance instructions.

6. Original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
 7. Each Contractor's coordination Drawings as-installed, color-coded piping diagrams.
 8. List of original manufacturer's spare parts to be left with the District at completion of construction; manufacturer's current prices; address, phone number, and FAX number of authorized repair facilities; address of factory; and recommended quantities to be maintained in storage.
 9. Other data as required under pertinent sections of these Specifications.
- B. Contents for each electrical and electronic system as appropriate.
1. Description of System and Component Parts
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and test data.
 - c. Complete nomenclature and commercial data.
 2. Circuit Directories of Panel Boards
 - a. Electrical service.
 3. As-installed, color-coded wiring diagrams.
 4. Operating Procedures
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 5. Maintenance Procedures
 - a. Routine and preventative maintenance operations.
 - b. Guide to "troubleshooting."
 - c. Disassembly, repair, and assembly.
 - d. Adjustment and checking.
 6. Manufacturer's printed operating and maintenance instructions.
 7. List of original manufacturer's spare parts, manufacturer's current prices, address, phone number, FAX number, and recommended quantities to be maintained in storage.

8. As-installed control diagrams by controls manufacturer. For each control device, provide a hard copy printout of the control program, annotated to describe all logic sequences. Provide a detailed description for modifying the control program.
- C. The Contractor shall be required to fill out the Mechanical Equipment Summary Sheet, Electrical Equipment Summary Sheet, and Instrumentation/Controls Equipment Summary Sheet electronically. The District shall provide electronic copies of the forms to the Contractor at the beginning of construction. The electronic forms currently reside in the District's form control system (FC 1792). Examples of the forms are included at the end of this Article.
- D. O&M documents shall be applicable to Equipment actually furnished with general sections related to other models deleted. Manuals shall be rejected if not satisfactorily marked.
- E. Such other information as may be required to provide comprehensive information on all systems, subassemblies, and components to enable operation, service, maintenance and repair shall also be provided.
- F. If, at the time of the Project Bid, any manufacturer, supplier, or Subcontractor offers for use or sale an electronic copy of operations and/or maintenance information, it shall be provided with the paper information.

14.10.04. Document Format

- A. General Requirements: Information and data shall be provided in the English language and per the customary Imperial System units of measure and weight (feet, inches, pounds, degrees in Fahrenheit, etc.). Supplemental metric units shall be included unless noted otherwise.
- B. Paper: white 20-pound bond minimum for typed pages.
- C. Size: 8½ inches X 11 inches.
- D. Binders
 1. Commercial quality post or ring-type binders with durable plastic covers.
 2. Minimum spine size of 1 inch.
 3. When multiple binders are used, correlate data into related consistent groupings.
- E. Text: Manufacturer's printed data or neatly word-processed information.

- F. Drawings
 - 1. Provide reinforced-punched binder tab; bind in with text.
 - 2. Fold larger drawings to size of text pages and include in clear plastic pockets.
- G. Provide fly leaf for each separate product or for each piece of operating Equipment.
 - 1. Provide typed description of the product and major component parts of Equipment.
 - 2. Provide indexed tabs for each product and piece of Equipment.
- H. Provide electronic files for all non-preprinted text (Word); spreadsheets (Excel); or CAD drawings (AutoCAD) included in the O&M manuals. These files shall become the property of the District for use in a master plan O&M manual, training programs, and other uses. The electronic file shall be a fully indexed, complete version of the O&M Manual in a portable document format (pdf).
- I. Depending upon the content of the O&M documents, the cover shall include appropriate titles as follows:
 - 1. For complete systems, "O&M Manual and Equipment Maintenance Data"; for individual Equipment, "Equipment Maintenance Data."
 - 2. Project name.
 - 3. District name.
 - 4. Equipment, product, or system name as appropriate.
 - 5. Applicable tag number.
 - 6. Date.
 - 7. Manufacturer's name and address.
- J. Table of Contents
 - 1. Neatly word-processed Table of Contents for each volume, arranged in systematic order.
 - 2. List of each Equipment piece or product included and indexed to the content of volume. Reference all District Equipment numbers.
- K. List with each product the name, address, telephone number, fax, and website URL (if available) of the following, and identify the area of responsibility for each:

1. Subcontractor or installer.
 2. Maintenance Contractor, as appropriate.
 3. Local source of supply for parts and replacement and list of recommended spare parts
- L. Identify each product by product name and other identifying symbols as shown on the Drawings and as specified herein, including nameplate information and shop order numbers for each item of Equipment furnished.
- M. Product Data
1. Include only those sheets that are pertinent to the specific products.
 2. Annotate each sheet to:
 - a. clearly identify specific product or part installed;
 - b. clearly identify data applicable to installation; and
 - c. delete references to inapplicable information.
- N. Drawings
1. Supplement product data with Drawings as necessary to clearly illustrate:
 - a. relations of component parts of Equipment and systems;
 - b. control and flow diagrams; and
 - c. coordinated drawings to ensure correct illustration of completed installation.
- O. Written text as required to supplement product data for particular installation.
1. Organize in consistent format under separate headings for different procedures.
 2. Provide logical sequence of instructions for each procedure.
- P. Copy of each warranty, bond, and/or service contract issued, as applicable.
- Q. Provide an information sheet for the District's personnel indicating:
1. proper procedures in event of failure; and
 2. instances that might affect validity of warranties.

14.10.05. Equipment, Products, and Systems Requiring O&M Documents

- A. Listed below are the Equipment, products, and systems for which the Contractor is required to furnish O&M documents in conformance with this Special Provisions Article.

1. Operation and Maintenance Document List

Specification No.	Description of Equipment/System
Section 32.05	Heating, Ventilating, and Air Conditioning Duct Accessories
Section 32.13	Fire Alarm Control System
Section 32.14	Water-Based Fire Suppression System
Section 32.15	Clean Agent Fire Extinguishing System
Section 36.01	General Electrical Requirements

2. The table above lists O&M documentation requirements for individual pieces of Equipment and for complete systems.
3. O&M documents for complete systems should include the O&M manual of the complete system, the Equipment Maintenance Data, and the Equipment Data sheet for each piece of Equipment that makes up a system.

14.10.06. Payment

- A. Full compensation for doing all Work required to provide O&M documents as specified herein shall be by the specified amount per each set of O&M documents as listed above.
- B. Payment for each O&M document shall be made progressively in the following manner:
- Forty (40) percent of the amount stated in the list above after the Contractor submits a draft O&M document that has been favorably reviewed by the District according to Special Provisions Article 14.10.02. Submittal Schedule, paragraph C.
 - Sixty (60) percent of the amount stated in the list above after the Contractor submits a final O&M document that has been favorably reviewed by the District according to Special Provisions Article 14.10.02. Submittal Schedule, paragraph F.

Instrumentation/Controls Equipment Summary Sheet

General Information

Facility: _____ System: _____
 Equip. Type: _____ Equip. ID: _____
 Location in Plant or Facility: _____
 Purchase/Replacement Value: \$ _____ Estimated Service Life (Years): _____

Nameplate Data - Driver

Size: _____ Serial No: _____
 Input Signal: _____ Model No: _____
 Output Signal: _____ Range: _____
 Power Supply: _____ Engr Units: _____
 Volts: _____ Cal Factor: _____
 AMPS: _____ Service: _____

Manufacturer

Name: _____ Phone: _____
 Address: _____ Web Address: _____
 City / St / Zip: _____

Manufacturer's Local Representative

Name: _____ Phone: _____
 Address: _____ Web Address: _____
 City / St / Zip: _____

Preventative Maintenance Procedures *Include: Task, Frequency, and Materials Required*

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____

Maintenance Comments

Recommended spare parts for this specific installation

1 _____	9 _____
2 _____	10 _____
3 _____	11 _____
4 _____	12 _____
5 _____	13 _____
6 _____	14 _____
7 _____	15 _____
8 _____	16 _____

Electrical Equipment Summary Sheet

<u>General Information</u>	
Facility: _____	System: _____
Equip. Type: _____	Equip. ID: _____
Location in Plant or Facility: _____	
Purchase/Replacement Value: \$ _____	Estimated Service Life (Years): _____
<u>Nameplate Data - Driver</u>	<u>Nameplate Data - Driven Unit</u> (e.g. Valve Actuator)
Frame: _____	Serial No: _____
Horse Power: _____	Model No: _____
RPM: _____	Size: _____
Phase: _____	Service: _____
Volts: _____	Stroke Time: _____
AMPS: _____	
<u>Manufacturer</u>	
Name: _____	Phone: _____
Address: _____	Web Address: _____
City / St / Zip: _____	
<u>Manufacturer's Local Representative</u>	
Name: _____	Phone: _____
Address: _____	Web Address: _____
City / St / Zip: _____	
<u>Preventative Maintenance Procedures</u> <i>Include: Task, Frequency, and Materials Required</i>	
1 _____	
2 _____	
3 _____	
4 _____	
5 _____	
6 _____	
7 _____	
8 _____	
<u>Maintenance Comments</u>	
<u>Lubricant List</u> <i>Include: Trade Name, Reference Symbol, and Specification (AGMA, NLIG, etc.)</i>	
1 _____	
2 _____	
3 _____	
4 _____	
5 _____	
<u>Recommended spare parts for this specific installation</u>	
1 _____	6 _____
2 _____	7 _____
3 _____	8 _____
4 _____	9 _____
5 _____	10 _____

Mechanical Equipment Summary Sheet

<u>General Information</u>	
Facility: _____	System: _____
Equip. Type: _____	Equip. ID: _____
Location in Plant or Facility: _____	
Purchase/Replacement Value: \$ _____	Estimated Service Life (Years): _____
<u>Nameplate Data - Driver</u> Frame: _____ Horse Power: _____ RPM: _____ Phase: _____ Volts: _____ AMPS: _____ <u>Nameplate Data - Driven Unit</u> (e.g. Valve Actuator) Serial No: _____ Model No: _____ Size: _____ Capacity: _____ TDH: _____ RPM: _____	
<u>Manufacturer</u>	
Name: _____	Phone: _____
Address: _____	Web Address: _____
City / St / Zip: _____	
<u>Manufacturer's Local Representative</u>	
Name: _____	Phone: _____
Address: _____	Web Address: _____
City / St / Zip: _____	
<u>Preventative Maintenance Procedures</u> Include: Task, Frequency, and Materials Required	
1 _____	
2 _____	
3 _____	
4 _____	
5 _____	
6 _____	
7 _____	
8 _____	
<u>Maintenance Comments</u>	
<u>Lubricant List</u> Include: Trade Name, Reference Symbol, and Specification (AGMA, NLIG, etc.)	
1 _____	
2 _____	
3 _____	
4 _____	
5 _____	
<u>Recommended spare parts for this specific installation</u>	
1 _____	6 _____
2 _____	7 _____
3 _____	8 _____
4 _____	9 _____
5 _____	10 _____

14.11. Maintenance of Record Documents

- A. The Contractor shall maintain at the site the following record documents:
 - 1. As-Built Drawings (full size).
 - 2. Specifications and Addenda.
 - 3. Favorably reviewed submittals, including shop Drawings, product data, samples, calculations, and other submittals.
 - 4. PCOs, Change Orders, DCOs, field orders, and other Contract modifications.
 - 5. Field and shop testing records.
 - 6. Survey records.
 - 7. Correspondence.
- B. The Contractor shall provide files and racks for orderly storage of the documents; maintain the documents in clean, dry, legible condition, and make all documents and samples available during regular business hours for inspection and reproduction by the Engineer.
- C. The Contractor shall keep the record documents current with construction in progress. Completed construction Work shall not be permanently concealed until required information has been recorded on the As-Built Drawings.

14.11.01. As-Built Drawings

- A. The Contractor is required to keep on-site and available for inspection at any time an accurately marked, legible, up-to-date set of Contract Drawings (as-built Drawings) for the Work installed. The Contractor shall record as the Work progresses changes to the original Contract Drawings, including, but not limited to, the following items:
 - 1. Field changes or adjustments in the final location or in the final dimensions or details of the Work.
 - 2. Changes resulting from RFIs, Change Orders, DCOs, and other Contract modifications.
 - 3. Locations of underground and above-ground utilities and appurtenances referenced to permanent, accessible features of the Work.
 - 4. Details not included in the original Contract Drawings but incorporated into the Work, referenced to approved shop Drawings, product data, samples, calculations, or other submittals.
 - 5. Location of items embedded or concealed from view (e.g., conduits, cables, junction boxes, piping, etc.).

- B. Changes shall be clearly described on the Drawings by note as required.
- C. All entries shall be dated, calling attention to the entry by a "cloud" drawn around the area or areas affected.
- D. The as-built Drawings shall be kept in a safe place and protected from damage by weather and manhandling. As-built Drawings shall be stored apart from documents used for performing the Work and shall be kept in a dry, legible condition and in good order. Do not use as-built Drawings for construction at the job site.
- E. Changed Work or conditions of the Work covered up or concealed by the Contractor in advance of recordation on the as-built Drawings shall be uncovered to allow accurate recordation of the change then re-covered all at the Contractor's expense.
- F. Changes shall be marked directly on the Contract Drawings in accordance with instructions provided in Appendix C. If there is insufficient space on a Drawing to mark up the change, the Contractor shall draw additional sketches to completely show the change and shall attach the sketches to the Drawing.
- G. The Engineer has the right to review the Contractor's as-built Drawings at any time to ascertain that they are being kept up to date and that they show sufficient detail. Should the Contractor's as-built Drawings not be up to date or should they lack necessary detail per the as-built guidelines, the Engineer may withhold five (5) percent from each monthly progress payment until the Drawings are deemed acceptable by the Engineer. Such review by the Engineer shall not relieve the Contractor of its responsibility for keeping the as-built Drawings current and complete.
- H. The construction as-built Drawings shall be stamped "As-Built" and shall be, at completion of construction, signed and dated by the Contractor and submitted as required in Article 11.03.01. As-Built Drawings.

14.12. Emergency Work

- A. No Special Requirements.

14.13. Dispute Review Board

- A. A Dispute Review Board (DRB) process is not required.

14.14. Escrow Bid Documents

- A. Escrow Bid Documents are not required.

14.15. Partnering

- A. No Special Requirements.

14.16. Insurance

- A. Without limiting the Contractor's indemnification of, or liability to, the District, the Contractor must provide and maintain at its own expense during the term of this Contract or as may be further required herein the following insurance coverages and provisions.
1. The Contractor must provide its insurance broker(s)/agent(s) with a copy of these requirements and warrants that these requirements have been reviewed by the Contractor's insurance agent(s) and/or broker(s) who have been instructed by the Contractor to procure the insurance coverage required herein.
 2. In addition to certificates, the Contractor must furnish the District with copies of original endorsements affecting coverage required herein. The certificates and endorsements shall be signed by a person authorized by the insurer to bind coverage on its behalf. All endorsements and certificates are to be received and approved by the District before the Contract commences. In the event of a Claim or dispute, the District has the right to require the Contractor's insurer to provide complete, certified copies of all required, and pertinent insurance policies, including endorsements affecting the coverages required herein.
- B. The Contractor must, at its sole cost and expense, procure and maintain during the entire period of this Contract through Acceptance of the Work by the District's Board of Directors the following insurance coverage(s).

14.16.01. Required Coverages

- A. Commercial general/business liability insurance with coverage as indicated.
1. **\$5,000,000** per occurrence/**\$5,000,000** aggregate limits for bodily injury and property damage.
 2. **\$5,000,000** products/completed operations aggregate to be maintained for at least three (3) years following acceptance of the Work by the District.
 3. General liability insurance must include the following:
 - a. Be written on standard ISO forms, or inspected by the District Risk Manager.
 - b. Coverage at least as broad as found in standard ISO Form CG 00 01.
 - c. Premises and operations.
 - d. Contractual liability expressly including liability assumed under this Contract.

- e. If the Consultant shall be working within 50 feet of a railroad or light rail operation, any exclusion as to performance of operations within the vicinity of any railroad bridge, trestle, track, roadbed, tunnel, overpass, underpass, or crossway must be deleted or a railroad protective policy in the above amounts provided.
 - f. Owners and contractors' protective liability.
 - g. Severability of interest.
 - h. Explosion, collapse, and underground hazards (X,C, and U).
 - i. Broad form property damage liability.
 - j. If the standard ISO form wording for "Other Insurance" or other comparable wording is not contained in the Consultant's liability insurance policy, an endorsement must be provided that states the insurance will be the primary insurance and that any insurance or self-insurance maintained by the District, its Directors, officers, employees, agents, or volunteers will be in excess of the Consultant's insurance and will not contribute to it.
- B. Business auto liability insurance with coverage as indicated.
- 1. **\$2,000,000** combined single limit for bodily injury and property damage per occurrence, covering all owned, non-owned, and hired vehicles.
- C. Builders' risk (course of construction) insurance.
- 1. Covering all risks of loss less policy exclusions for an amount equal to the completed value of the Project with no coinsurance penalty provisions. Builder's Risk policy shall name Santa Clara Valley Water District as the loss payee.
- D. Workers' compensation and employer's liability insurance.
- 1. Statutory California workers' compensation coverage covering all Work to be performed for the District.
 - 2. Employer liability coverage for not less than **\$1,000,000** per occurrence.
- E. Surety bonds
- 1. The Contractor shall provide the following surety bonds:
 - a. A Bid bond as specified in the Notice to Bidders.
 - b. A performance bond as required by the Instructions to Bidders.
 - c. A payment bond as required by the Instructions to Bidders.

- F. Environmental Pollution Liability: In the event that Hazardous, contaminated Material is discovered during the course of the Work and the Contractor or its Subcontractor is required to perform abatement or disposal of such Material, then the Contractor or its Subcontractor who performs abatement of Hazardous or contaminated Material removal shall maintain in force, throughout the term of this Contract, the Contractor's pollution liability insurance with limits not less than \$1,000,000 for each occurrence combined single limit (true occurrence form), including coverages for on-site or off-site third-party claims for bodily injury and property damage.

14.16.02. General Requirements

- A. Additional Insured Endorsement(s): The Contractor must provide an additional insured endorsement for commercial general/business liability and business automobile liability coverage naming the Santa Clara Valley Water District, its Directors, officers, employees, and agents, individually and collectively, as additional insured and must provide coverage for acts, omissions, etc. arising out of the named insureds' activities and Work. The following shall also be added to the additional insured endorsement:
- i. United States Bureau of Reclamation, its officers, officials, employees and volunteers
- B. Primacy Clause: The Contractor's insurance must be primary with respect to any other insurance that may be carried by the District, its officer, agents, and employees; the District's coverage must not be called upon to contribute to or share in the loss.
- C. Cancellation Clause Revision: The Certificate of insurance must provide a 30-day notice of cancellation (10-day notice for nonpayment of premium).
NOTE: The standard wording in the ISO certificate of insurance is not acceptable. The following words must be crossed out or deleted from the standard cancellation clause: ". . . endeavor to . . ." AND ". . . ; failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents, or its representatives."
- D. Acceptability of Insurers: All coverages must be issued by companies admitted to conduct business in the State of California that hold a current policyholder's alphabetic and financial size category rating of not less than A-V according to the current *Best's Key Rating Guide* or to a company of equal financial stability that is approved by the District's risk management administrator.
- E. Self-Insured Retentions or Deductibles: Any deductible or self-insured retention must be declared to and approved by the District. At the option of the District, either (i) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the District, its officers, officials, employees, and volunteers; or (ii) the Contractor shall provide a financial guarantee satisfactory to the entity guaranteeing payment of losses and related investigations, claim administration, and defense expenses.

- F. Subcontractors: The Contractor must require each of its Subcontractors of any tier to carry the aforementioned coverages, or the Contractor may insure Subcontractors under its own policies.
- G. Amount of Liability Not Limited to Amount of Insurance: The insurance procured by the Contractor for the benefit of the District must not be deemed to release or limit any liability of the Contractor. Damages recoverable by the District for any liability of the Contractor must, in any event, not be limited by the amount of the required insurance coverage.
- H. Coverage to be Occurrence-Based: All coverage must be occurrence-based coverage. Claims-made coverage is not allowed.
- I. Waiver of Subrogation: The Contractor agrees to waive subrogation against the District to the extent that any loss suffered by the Contractor is covered by any commercial general liability policy, automobile policy, workers' compensation policy, or builders' risk policy described in Article 14.16.01. Required Coverages. The Contractor agrees to advise its broker/agent/insurer about this provision and obtain any endorsements, if needed, necessary to ensure the insurer agrees.
- J. Noncompliance: The District reserves the right to withhold payments to the Contractor in the event of Material noncompliance with the insurance requirements outlined above.
- K. The Contractor shall mail or deliver the certificates and endorsements to:
- Capital Program Planning & Analysis
 - Unit Manager
 - Santa Clara Valley Water District
- See District website (<https://www.valleywater.org/Construction>) for appropriate address to mail, express mail, or hand carry.
- L. The certificate of insurance must include the name of the Project.
- M. For any questions, the Contractor's insurance broker is advised to call the District Risk Management Administrator at (408) 630-2213.

14.17. Web-Based Construction Document Management

- A. No Special Requirements.

SECTION 15. GENERAL COORDINATION

15.01. Meeting Requirements

- A. This Article includes requirements for scheduling, attending, and conducting Project meetings for the purpose of addressing issues related to the Work and for reviewing and coordinating progress of the Work. Project meetings include the preconstruction meeting, progress meetings, coordination meetings, and special meetings as specified herein.
- B. Qualifications of meeting participants: Representatives of firms and organizations participating in each meeting shall be qualified and authorized to act on behalf of the firm or organization they represent.

15.01.01. Preconstruction Meeting

- A. The purpose of the preconstruction meeting is to review the Project, designate responsible personnel, and inform the Contractor of the District's Contract administrative procedures, correspondence communication protocol, and other special requirements of the Contract. The Contractor shall come prepared to discuss its staffing, how it will successfully perform the Work, and discuss its plan for temporary utilities, safe Work environment, environmental compliance, emergency response, and any tie-ins, outages, or shutdowns. The Contractor shall also be prepared to review and discuss the Contractor's markup breakdown, Change Order pricing structure, the Standards to be used on the Project, and what the Contractor must provide as backup for Change Orders or for extra Work pricing.
- B. The Engineer will arrange the preconstruction meeting and will notify the Contractor regarding the meeting time, date, and place. The meeting shall be attended by the Contractor and its Superintendent and all representatives of Subcontractors or suppliers whom the Contractor may desire to invite or whom the District may request with the intent being a full understanding of the issues discussed by all parties. The Engineer shall prepare the agenda, preside at the meeting, and record meeting minutes.

15.01.02. Progress Meetings

- A. The Engineer shall conduct progress meetings on a regular weekday and at a time mutually agreed to by the Contractor and by the Engineer. The purpose of the progress meetings is to review construction progress; submittal status; Potential Change Order, Change Order, and DCO status; construction safety issues and concerns; conflicts; environmental compliance; public/neighborhood issues; progress payments; and any other subject as deemed appropriate.
- B. The Contractor shall allow for one (1) meeting a week.
- C. Subject to the Engineer's approval, the frequency of the progress meetings may be reduced at the beginning and at the end of the construction period.

- D. The Contractor's superintendent, suppliers, and Subcontractors shall attend the meetings as required. Third parties, such as agency representatives and utilities, may be invited by the Engineer to attend as deemed appropriate.
- E. Typical agenda. Typical agenda items can include:
 - 1. Review and approval of previous meeting minutes.
 - 2. Review of progress since the previous meeting.
 - 3. Contractor's Progress Schedules, including Look-Ahead Schedules.
 - a. Review of off-site fabrication and delivery schedules.
 - b. Problems that may affect the Contractor's schedule performance.
 - c. Corrective measures to recover from forecasted Delays whether Excusable or Inexcusable.
 - d. Updates and/or revisions to the Contractor's Detailed Progress Schedules.
 - 4. Interface with operations.
 - 5. Safety and security.
 - 6. Review of submittals schedule.
 - 7. Status of RFIs.
 - 8. Field observations, problems, and conflicts.
 - 9. Status of QC inspections and corrections.
 - 10. Environmental issues.
 - 11. Housekeeping.
 - 12. Status of submittal review.
 - 13. Status of PCOs.
 - 14. Status of COs.
 - 15. Other business.
 - 16. A review of the monthly billing once per month.

15.01.03. Coordination and Special Meetings

- A. The Engineer shall conduct other coordination and special meetings in addition to progress meetings when appropriate. The purpose of these meetings is to discuss and coordinate shutdowns, outages, utility tie-ins, and any other special issues as deemed necessary.
- B. Date, time, and location for coordination and special meetings shall be as mutually agreed to by the Engineer and by the Contractor. The Contractor shall ensure attendance of appropriate Contractor staff, Subcontractors, and suppliers.

15.02. Integration and Coordination with District Operations**15.02.01. Overview of Existing Systems and Facilities**

- A. The PPP was built in the 1980's by the United States Bureau of Reclamation. PPP is the primary source of raw water for the Santa Clara Valley Water District and the San Benito County Water District.
- B. PPP is located near Dinosaur Point on San Luis Reservoir in Merced County, east of the old Pacheco Pass Highway and off Pacheco Pass Highway 152 East, and west of the 1-5 South exit.
- C. The following is a cursory overview of typical processes, functions, and work at the PPP. Not all items listed are shown on the Drawings.
 - 1. Pumping Plant:
 - a. Water is lifted from the San Luis Reservoir by the 12 adjustable speed vertical pumps and discharged into the Pacheco Regulating Tank. From the tank outlet, the water flows by gravity through the 114-inch Pacheco Tunnel and the Pacheco Conduit which terminates at the Pacheco Bifurcation Structure.
 - b. Adjustable Speed Drive (ASD) Gallery: Pump and motor control cabinets, and other critical equipment
 - 2. Switch Yard Area: 4,160-volt switchyard area outside the building.
 - 3. Additional Buildings on Site:
 - a. Western Area Power Administration (WAPA) Substation Control Building: substation control and alarm panels and battery room.
 - b. Maintenance Building
 - c. Lube Oil Building
 - d. Lunchroom and Restroom Trailers

- e. Pressure Tank and Well Pump Building
- f. Shipping Containers

15.02.02. Requirements of an Operational Facility or System

- A. The Plant is operated remotely and has the capability for local manual and automatic operations. This operation is via a Supervisory Control and Data Acquisition System (SCADA) which is separate from the fire alarm system. The local fire alarm system is connected to a separate fire alarm panel which is connected to a central station and the central station notifies both District staff and Cal Fire of any alarms.

15.03. Coordination of Work Activities

- A. No Special Requirements.

15.03.01. Work by Others

- A. The Contractor shall coordinate its Work with the planned or ongoing Work of the District or of other District Contractors within or adjacent to the limits of the Contract Work in accordance with Article 4.15. Cooperation with Others. No additional payment shall be made, or Claims considered for Delay caused due to the Contractor's failure to coordinate the Work.
- B. The Contractor shall complete the following activities as requested by the Engineer to assist in the coordination of Contract Work with Work by others: attend planning meetings; review and comment on Project documents relative to coordination aspects; schedule Work to promote efficient installation of all improvements; move Equipment, Material, or vehicles to allow Work by others to proceed; and other reasonable activities.
- C. The Contractor is advised that the following pumping plant maintenance and miscellaneous improvements and Work may take place during the Work of this Contract:
 - 1. District staff will be completing miscellaneous minor improvements, servicing, and repairs to all areas of this pumping plant during the course of this Work.
 - 2. The District shall contract with a variety of firms during the course of this Work to complete improvements that are outside the scope of this Work.

15.03.02. Coordination With Others

- A. The Contractor is advised that District Staff will be solely responsible for the operation of the Pacheco Pumping Plant.

15.04. Construction Survey

- A. No Special Requirements.

15.05. Public Notification

- A. No Special Requirements.

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SECTION 16. WORK CONSTRAINTS AND SITE RESTRICTIONS

16.01. General Work Constraints

- A. The Pacheco Pumping Plant supplies about 600 acre-feet of water per day from San Luis Reservoir to San Benito County and Santa Clara County. During the installation of the PPP Fire Suppression System there should be zero unplanned outages caused by the project and necessary shutdowns must be scheduled.

16.02. Utilities

- A. The Contractor's attention is directed to Standard Provisions Article 4.10. Preservation of Property and Article 4.25. Coordination with Utilities.
- B. Various existing utilities, both above and below ground, may be encountered during construction. The Contractor shall perform all Work in such a manner so as to avoid damage to existing utilities. The Contractor is responsible for any damage due to failure to exercise due care.
- C. The Contractor shall notify underground service alert (U.S.A.) a minimum of five (5) working Days prior to the start of excavation or demolition in accordance with California Government Code requirements. The Contractor is responsible for coordinating the U.S.A. notification according to the Contractor's schedule; any delay due to utility markings through the U.S.A. process is the responsibility of the Contractor.
- D. The Contractor shall verify the exact location of all indicated or field marked utilities and shall make a sufficient number of exploratory excavations of all utilities that may interfere with the Work sufficiently in advance of the construction. The Contractor shall promptly notify the Engineer when such exploratory excavations show the utility location as shown on the Drawings to be in error.
- E. The Contractor shall not interrupt the service function or disturb the support of any utility without authority from the utility owner or an order from the Engineer. All valves, switches, vaults, and meters shall be maintained and readily accessible for emergency shutoff.

16.02.01. Utility Coordination

- A. The Contractor is responsible for coordination of Work near utilities and for the protection of the utility during construction.
- B. The telephone numbers of owners of known utilities that may be encountered are:

District	(408) 630-2650
PG&E Gas & Electric	(800) 743-5000

Western Area Power Administration (916) 353-4469

CAL Fire (408) 500-1000

- C. The District and the owners of utilities or their authorized agents reserve the right to enter upon the right of way at all times for the purpose of operations and maintenance of their facilities or for making necessary connections or repairs to their properties. The Contractor shall cooperate with the District and with the affected utilities engaged in such Work to avoid any unnecessary Delay or hindrance to such Work.

16.02.02. Protection of Existing Utilities

- A. The Contractor is responsible for doing all Work and furnishing all Materials required for protecting in place or restoring all existing above- and below-ground utilities disturbed or damaged during construction to a condition equal to or better than that existing prior to construction.
- B. The Contractor shall protect all utilities that may be impacted by the Work. All exposed utilities shall be supported firmly and uniformly conforming to the utility requirements. No utilities shall be left exposed for a period exceeding eight (8) hours unless approved by the utility and by the Engineer. Unless otherwise shown on the Drawings, all utilities shall be backfilled with at least 12 inches of select imported backfill around the utility.
- C. All utility pole and guy anchors shall be protected, and, where the walls of a trench are within five (5) feet of a pole or anchor, lateral support to the pole shall be provided by the Contractor.
- D. The Contractor shall immediately notify the utility owner and the Engineer if any existing utilities have sustained damage prior to excavation or if the Contractor disturbs or damages the existing utility during the excavation. The Contractor shall bear the cost of repair or replacement of any utility damaged as a result of construction operation.

16.02.03. Utility Installation/Relocation by Others

- A. No Special Requirements.

16.03. Protection of Existing Improvements

- A. The Contractor's attention is directed to Standard Provisions Article 4.10. Preservation of Property.

16.03.01. Survey Monuments

- A. No survey monuments, permanent markers for the District right of way, or District survey control points shall be removed or disturbed until the Engineer has recorded the locations thereof and a permit for such removal has been received

from the agency having jurisdiction. When the construction Work has been completed, the Contractor shall replace the monuments accurately in the locations as referenced by the Engineer.

- B. If any marker or monument is destroyed by the Contractor without prior written approval of the Engineer, the Contractor shall be responsible for the accurate replacement of the marker or monument (i) by a land surveyor licensed by the State of California; (ii) in accordance with the California Business and Professions Code Chapter 15 Land Surveyors, Section 8771; and (iii) at no expense to the District.

16.04. Preconstruction Surveys

- A. No Special Requirements.

16.04.01. Preconstruction Survey Within the Project Limits

- A. After the Contract has been awarded and before commencement of the Work, the Contractor shall conduct a thorough examination of the Work areas within the Project limits only after notification and coordination with the Engineer.
- B. The Contractor shall inspect the condition of all areas that may have potential impacts, including, but not limited to, existing improvements, levees, ramps, buildings, landscape planting, architectural finishes, the size of structural cracking or settlement, the rate of leakage, and any other conditions deemed appropriate. The presence of the Engineer shall in no way relieve the Contractor of the responsibility for completely and accurately documenting all existing conditions.
- C. Records of all observations shall be prepared by the Contractor; every copy of all documents shall be signed by the authorized representative of the Contractor and provided to the Engineer. Photographs and videos with dates shall be made by the Contractor and included in the record of observations. One (1) signed copy of every document, photograph, and video will be kept on file in the office of the Engineer.
- D. The above records, photographs, and videos are intended for use as evidence in ascertaining the extent of any damage that may occur as a result of the Contractor's operations during the prosecution of the Work.
- E. Structural surveys, if required, shall be conducted by a licensed civil or structural engineer.

16.04.02. Surveys of Properties in the Vicinity of the Work

- A. No Special Requirements.

16.05. Rights of Way

- A. Work will be located in District-furnished rights of way. The Contractor shall comply with the ordinances, regulations, and all other requirements of the authorities governing work in public streets and rights of way.

16.05.01. District-Furnished Right of Way

- A. The District has provided all rights of way as shown on the Drawings. The Contractor has full use of this right of way except for the limitations specified in these Specifications and as noted on the Drawings.

16.05.02. Contractor-Furnished Right of Way

- A. Any additional rights of way desired by the Contractor for its convenience shall be acquired by the Contractor at no expense or obligation to the District. The Contractor shall provide the Engineer with copies of any agreements between the Contractor and property owners regarding disposal of excess Materials generated by the Contractor's activities, storage of Materials, or any use of property in conjunction with this Project. The agreement shall state that the agreement is solely between the Contractor and the property owner and that the District is not a party to the agreement and not responsible for compliance with any conditions stated in the agreement.

16.05.03. Temporary Construction Easements

- A. No Special Requirements.

16.06. Access to Properties Owned by Others

- A. The Contractor shall conduct the construction operations in a manner that cause as little inconvenience as possible to adjacent property owners.
- B. Convenient access to driveways, houses, buildings, and businesses along the Work shall be maintained in operational condition; temporary approaches to crossings or to intersecting streets shall be provided and kept in good condition.
- C. When construction operation is directly within the driveway area, temporary access shall be provided. The existing access shall not be closed until the temporary replacement access is usable. Once construction is completed, access shall be restored to a condition equal to or better than the existing condition prior to the Contractor's operation.
- D. The Contractor shall comply with California Vehicle Code Sections 22500 Prohibited Stopping Standing or Parking and 22500.1 Additional Prohibited Stopping Standing or Parking Fire Lane regarding stopping, parking, or leaving any vehicle in front of a public or private driveway.

16.07. Access to the Job Site

- A. The Project location is shown on a map included in the Drawings. The Contractor may use the existing roads to access and perform the Work subject to the restrictions specified herein.
- B. It is the Contractor's responsibility to obtain any and all permits that may be required from all applicable regulatory agencies to move Materials and Equipment to the job site, dispose of excess Material created by the Contractor's operation, and for traffic control to, from, and on the Project sites.
- C. Project site access routes, staging areas, and work areas will be carefully controlled. Gates will control ingress and egress to the site. On-site access and work time will be allowed only during the daylight (dawn to dusk).

16.08. Access Roads Within the Job Site

- A. The Contractor shall maintain access roads to all staging, office trailer, storage areas, and to other areas to which frequent access is required. The Contractor shall maintain access to all other existing facilities on the site, including access for delivery of Materials and for maintenance and operation.
- B. The Contractor is responsible for damages to buried utilities resulting from loads imposed on temporary roads constructed by the Contractor or other access routes used by the Contractor.
- C. The Contractor shall maintain on-site access roads free of mud. Under no circumstance shall vehicles leaving the site track mud or dirt off the site onto public rights of way.
- D. The Contractor will be performing work at a pumping plant facility. The Contractor shall schedule and perform his/her work such that there is no disruption to the facility access and operations and maintenance activities. Access to the facility and all portions of the facility shall be maintained at all times for the staff, and other delivery vehicles.
- E. Speed limit shall be limited to 10 MPH for all vehicles. For offsite restrictions, comply with local agencies requirements.
- F. The Contractor shall provide a minimum of one (1) route for fire engine access to all structures (i.e., existing, new, and those under construction) at all times. Such a route shall be at least 20 feet wide and have a minimum of 13 feet 6 inches clear height. The Contractor shall post signs to indicate the vehicle travel route if it is not along the existing roadways so that travel route is evident to emergency vehicle operators. A turnaround adequate for a fire engine is required when any roadway to a structure is a "dead end" over 150 feet long.

16.09. District Use of Facilities/Premises Within the Work Area

- A. The District reserves the right to access and use the following premises during performance of the Work to conduct operations and maintenance of District facilities.
- B. The Contractor shall coordinate all construction operations with the District to avoid conflict and to facilitate the District's use of the premises.
- C. Unless otherwise altered by the Work, the Contractor shall restore the premises to preexisting condition, and shall immediately repair any damages to the premises caused by the Contractor's operations.

SECTION 17. SAFETY AND SECURITY

17.01. Safety

- A. The Contractor's attention is directed to Section 8 of the Standards that includes requirements for a Site Safety and Health Supervisor, a site-specific Safety and Health Plan, and an Injury and Illness Prevention Program.

17.02. Safety and Health Program

- A. If Hazardous Waste is encountered during the Work, the requirements in Article 8.10., Safety and Health Program for Hazardous Waste Operations, shall apply.

17.03. Security Requirements at Job Site

- A. Contractor shall make adequate provision for the protection of the work area against fire, weather, theft, vandalism, and for the protection of the public against exposure to injury. All costs arising from theft, fire, or vandalism of the construction materials and equipment shall be borne by the Contractor.
- B. The Contractor shall not allow his/her staff to stay at the project site outside of normal hours or authorized work hours.

17.03.01. General

- A. No special requirements.

17.03.02. Identification and Badging

- A. To access the Pacheco Pumping Plant a badge is required, refer to Standard Provisions Section 8 Article 8.17 for Identification and Badging.

17.03.03. Background Checks

- A. Refer to Standards Provisions Section 8 Article 8.18 for Background Checks.

17.03.04. Site Access Control

- A. Refer to Section 8, Article 8.19. Site Access Control.

17.03.05. Mail and Postal Deliveries to the Project Site

- A. No Special Requirements.

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SECTION 18. PERMITS AND REGULATIONS

18.01. Permits and Agreements

18.01.01. District-Obtained Permits

- A. The District has no permits needed to be obtained prior to the start of Work on this Project.

18.01.02. Contractor-Obtained Permits

- A. It shall be the Contractor's responsibility to obtain and pay associated fees for any and all permits that may be required from City, County, or State for construction, moving materials and equipment to and from the jobsites, and for traffic control to and from the jobsites. Those include the permits listed in the Standard Provisions and those listed below.
 - 1. BMP Action Plan
 - 2. All permits required by Cal-OSHA for construction activities.
 - 3. The Contractor will be responsible for obtaining permits for a Haul Route Permit from the authority(ies) having jurisdiction.

18.02. Hours of Work

- A. Unless noted otherwise, No Work, including Material hauling to/from the site and Equipment movement, shall be performed during the Days and hours restricted by and set forth in this Article.
- B. No Work shall take place between 7:00 p.m. and 7:00 a.m. on weekdays.
- C. No Work shall take place, between the hours of 6 p.m. to 9 a.m. on Saturdays and Sundays, or at any time on the holidays listed below ***unless approved in advance by the Engineer.***
- D. New Year's Day, Martin Luther King's birthday, Presidents' Day, Cesar Chavez Day, Memorial Day, Independence Day, Labor Day, Indigenous Peoples' Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving, and Christmas Day. If any of the above holidays should fall on a Sunday, the following Monday shall also be considered a holiday. If a holiday should fall on a Saturday, the previous Friday shall also be considered a holiday.
- E. Contractor must submit in writing to the Engineer requests to work outside of working days and hours allowed herein. Contractor's request shall include description of work Contractor plans to accomplish, construction activities, personnel and equipment to be utilized, and the days and hours outside the allowed working days and hours the work will be occurring. Unless it is considered an emergency by the District, requests shall be made three (3) working days in advance.

For additional restrictions to hours of Work refer to Section 16. General Work Constraints and Site Restrictions.

18.03. Noise Pollution and Vibration**18.03.01. Noise**

- A. The Contractor shall be responsible for ensuring that noise produced by construction activities does not exceed the applicable local noise ordinance standards and is in compliance with the performance standards set forth in this Article.
- B. The Contractor shall comply with Merced County Code Chapter 10.60—Noise Control. See Appendix D.
- C. No work shall be allowed at any time on a weekend day or holiday if the sound level exceeds any applicable relative or absolute limit specified in Section 10.60.030—Sound Level Limitations under Merced County Code Chapter 10.60.
- D. As a minimum, the Contractor shall exercise precautionary measures listed below. Installation of these measures shall in no way relieve the Contractor of the responsibility of compliance with the noise criteria.
 - 1. Air compressors and internal combustion engines shall be in good operating condition that meet or exceed original factory specifications and shall be equipped with high-grade mufflers, air-inlet silencers, where appropriate, and noise suppressers.
 - 2. All mobile or fixed noise producing machinery and equipment, including “package” equipment such as fans, cranes, arc-welders, air compressors, electrical operators and the like, shall be suitably housed, enclosed, shielded, equipped with noise control features, or muffled to meet the noise limits specified within this Article.
 - 3. All mobile or fixed noise producing equipment used by the Contractor that is regulated for noise output by local, state, or federal law shall comply with such regulation while in use. This shall include vehicles licensed for use on public highways.
 - 4. Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used, where feasible.
 - 5. Material stockpiles and mobile equipment staging, parking, and maintenance and equipment staging areas shall be located as shown on the Drawings.
 - 6. The use of noise-producing signals, including horns, whistles, alarms, and bells shall be for safety warning and emergency purposes only.

7. No music system including personal or vehicle radio, tape, or CD players or the like shall be audible at the Project right of way line.
8. Trucks or other mobile equipment shall not use engine decompression ("Jake Brakes") for deceleration on grades.

18.03.02. Noise Monitoring

- A. Noise Monitoring: The Engineer will occasionally take sound readings with a hand-held noise-level meter during construction activities and operations of any noise-producing Equipment to monitor the Contractor's compliance with the noise criteria. Any Equipment causing noncompliance with the noise criteria shall be removed from the job site as directed by the Engineer.

18.03.03. Vibration Monitoring

- A. The Contractor shall take all necessary precautions during its operations to limit peak particle velocities from vibratory compaction or percussion equipment so that they do not become a public nuisance or result in property damage. The Contractor shall refer to local ordinances on vibration monitoring requirements.
- B. The Contractor's compliance with this Section does not relieve the Contractor of full responsibility for damage caused by the Contractor's operations.

18.04. Air Pollution

- A. No Special Requirements.

18.05. Spillage and Dust

- A. Specified dust controls shall be implemented such that visible dust plumes are retained within the property lines. Dust controls include watering and other measures, such as preventing trackout, paving unpaved roads, covering or treating stockpiles, etc., with the extent of controls varying with the size of the Project.

18.06. Traffic Control

- A. No Special Requirements.

18.07. Truck Traffic and Hauling

- A. Trucks traffic and haul routes shall be in compliance with local permits and ordinances. The Contractor shall obtain, at Contractor's expense, any required Haul Route Permits from the applicable local jurisdictions.

18.07.01. Truck Arriving Early, Truck Idling, and Queuing

- A. No Special Requirements.

18.08. Parking

- A. Trucks and Contractor personnel vehicle parking and access shall be in compliance with local permits and ordinances and as further specified herein.
- B. All construction equipment and worker vehicles shall park within the staging area. Parking within other parts of the fenced project site may be allowed subject to the approval of the Engineer.

18.09. Discovery of Archeological Artifacts and Human Remains

- A. No Special Requirements.

18.10. Aesthetic Requirements

- A. No Special Requirements.

18.11. Recreation

- A. No Special Requirements.

18.12. Utilities and Service System

- A. No Special Requirements.

18.13. Payment

- A. Unless noted otherwise, full compensation for Work involved in complying with all requirements under Special Provisions Section 18 Permits and Regulations shall be considered incidental and included in the Contract Price(s) paid for the various items of Work involved; no additional time shall be allowed or payment made.

SECTION 19. ENVIRONMENTAL

19.01. Compliance With NPDES General Permit

- A. This Project is not subject to the requirements of the NPDES General Permit. The Contractor is referred to Special Provisions Article 19.03. BMP Action Plan.

19.01.01. SWPPP

- A. No Special Requirements.

19.01.02. Storm Water BMPs

- A. The Contractor shall comply with the risk level 1 requirements of the NPDES General Permit.

19.02. Other Discharge Permits

- A. No Special Requirements.

19.03. BMP Action Plan

- A. For Projects that are not subject to the NPDES General Permit, the Contractor shall prepare and implement a BMP Action Plan.
 - 1. The BMP Action Plan shall incorporate storm water BMPs and applicable Risk Level 1 requirements in accordance with the NPDES General Permit (Order # 2009-0009 DWQ). A copy of the NPDES General Permit can be found at the following:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_complete.PDF.
 - 2. The Contractor shall design, construct, operate, inspect, and maintain the BMPs in accordance with the current CASQA Construction BMP Handbook/Portal available at www.cabmphandbooks.com.
 - 3. The BMP Action Plan shall include, but shall not be limited to, the following:
 - a. Erosion control BMPs
 - b. Sediment control BMPs
 - c. Run-on/runoff control BMPs
 - d. Wind Erosion control BMPs
 - e. Tracking control BMPs
 - f. Non-storm-water management BMPs
 - g. Waste management and Material pollution control BMPs

4. The BMP Action Plan shall include (i) a site map showing the construction areas, staging areas, and where BMPs and other requirements are implemented; and (ii) a diagram of site storm water drainage patterns, including the Local storm drain system and the receiving waterway.
5. Prior to the commencement of any Work activities in the field, the Contractor shall receive a favorable review of the BMP Action Plan by the Engineer.

19.03.01. Payment

- A. Full compensation for doing all Work necessary to prepare and implement the BMP Action Plan, including all Materials, labor, Equipment, services, supervision, documentation, and submittals, shall be considered incidental and included in other items of Work; no additional payment shall be made.

19.04. Water Pollution Discharges

- A. No Special Requirements.

19.05. Regulated Material Management

- A. No Special Requirements.

19.06. Solid Materials Management**19.06.01 Definitions**

- A. Certified Facility: A reuse, recycling, composting, or Materials recovery facility meeting the required Diversion percentages set forth in this Specification, which the Engineer (i) has determined can accept diverted Material; (ii) has obtained all applicable Federal, State, and Local permits; and (iii) is in full compliance with all applicable regulations for reuse, recycling, composting, and/or Materials recovery.
- B. Construction Waste: Building and site improvement Materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste does not include any of the above specified Material/solid waste that contains contaminated or hazardous substances. Construction waste does not include excavated soil or groundwater.
- C. Demolition Waste: Building and site improvement Materials resulting from demolition or selective demolition operations. Demolition waste does not include any of the above specified Material/solid waste that contains contaminated or hazardous substances.
- D. Disposal: Removal off site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in a landfill or an incinerator acceptable to authorities having jurisdiction.

- E. Divert/Diversion: Use of Materials for any lawful purpose other than disposal in a landfill or in a transformation facility.
- F. Post-Consumer Recycled Content: The percentage of a new product that contains Materials that were recycled from product that was used by the end consumer and then collected for recycling.
- G. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for use in some other form.
- H. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in the same form in another facility.
- I. Transformation Facility: A facility whose function is to convert, combust, or otherwise process solid waste by incineration, pyrolysis, destructive distillation, or gasification or to chemically or biologically process solid waste for the purpose of volume reduction, synthetic fuel production, or energy recovery. A composting facility is not a transformation facility.

19.06.02. Construction and Demolition Waste Management

- A. The Contractor shall submit a solid Materials management plan identifying procedures to be used for management of construction and demolition Waste generated by the Work, including the facilities to be used for both disposal and recycling/salvaging and the estimated quantities and percentages (by weight) of construction demolition waste disposed and recycled/salvaged categorized by waste type. For each facility listed in the waste management and recycling plan, the Contractor shall provide the facility name and address, facility owner name, and contact information. This submittal shall be approved by the Engineer prior to commencement of any Work on the Project site.
- B. The Contractor is directed to the City of San Jose's Construction and Demolition Deposit Program Certified Facility List (http://www.sjRecycles.org/business/PDF/cddd_certified_list.PDF) for Local construction and Demolition Waste recycling service provider listings. Additional recycling resources are available at www.ciwmb.ca.gov/condemo/ and www.crra.com/cdc/index.html.
- C. Full compensation for completing the Solid Materials Management Plan and for completing the solid Materials management report form shall be considered as included in the Contract Price(s) for various items of Work involved; no additional payment shall be made.

19.06.03. Post-Consumer Recycled Content Requirements

- A. At the conclusion of the Project, the Contractor shall list Materials furnished/installed that contains PCRC and document the percent content for each Material item listed. This information shall be included in the solid Material management report form specified in Article 19.06. Solid Material Management.

- B. Full compensation for documenting the above specified information in the solid material management report form shall be considered as included in the Contract Price(s) for various items of Work involved; no additional payment shall be made.

19.07. Migratory Birds

- A. Refer to Standard Provisions Article 10.14. Migratory Birds for additional requirements.

19.07.01. Regulatory Requirements**19.07.02. Qualified Biologist**

- A. If required, the District shall provide a Biologist to perform all specified requirements of a Qualified Biologist.

19.07.03. General Nesting Seasons

- A. The bird nesting season in and around the Project area is generally considered to be from January 15 through August 31. However, annual variation in climatic conditions can alter these periods by several weeks.

19.07.04. Protective Buffer Zones

- A. Refer to Standard Provisions Article 10.14.04. Protective Buffer Zones.

19.07.05. Exclusion Devices

- A. Refer to Standard Provisions Article 10.14.05.

19.07.06. Nest Prevention

- A. Refer to Standard Provisions Article 10.14.06. Nest Prevention.

19.07.07. Submittals

- A. No Special Requirements.

19.07.08. Payment

- A. Work involved in complying with the requirements of this Article shall be considered as included in the Contract Price(s) paid for the various items of Work involved; no additional time or payment shall be made.

19.08. Other Wildlife and Fish Species

- A. No Special Requirements.

19.09. Sensitive Plants and Vegetation

- A. No Special Requirements.

19.10. Proper Pruning Techniques for Woody Vegetation Removal

- A. Refer to Standard Provisions, Article 10.17. Proper Pruning Techniques for Woody Vegetation Removal.

19.11. Plant Pathogen Management

- A. No Special Requirements.

19.12. Payment

- A. Unless noted otherwise, full compensation for Work involved in complying with all requirements under Special Provisions Section 19 Environmental shall be considered incidental and included in the Contract Price(s) paid for the various items of Work involved; no additional time or payment shall be made.

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SECTION 20. SUBMITTAL AND QUALITY REQUIREMENTS

20.01. Additional Submittal Requirements

- A. This Article includes any additional submittal requirements. Also see Standard Provisions Section 7 Submittal Management.

20.01.01 General Requirements

- A. Submittals shall be in accordance with Standard Provisions Article 7.05. Submittals to be Furnished by the Contractor unless otherwise modified herein.

20.01.02. Immediate Submittals

- A. Physical construction Work cannot begin until the following immediate submittals have been favorably reviewed by the Engineer. These immediate submittals shall be submitted no later than ten (10) Days after the date of issuance of the NTP.
 - 1. Section 03 Contractor Staffing – Résumé of Project Superintendent
 - 2. Section 05 Preliminary Progress Schedule
 - 3. Section 08 Injury and Illness Prevention Plan (IIPP)
 - 4. Section 08 Site Security and Protection Plan
 - 5. Section 08 Site-Specific Safety and Health Plan
 - 6. Section 09 Contractor's Quality Control Program
 - 7. Section 10 BMP Action Plan
 - 8. Section 18 Contractor-Obtained Permits
- B. These immediate submittals shall be submitted no later than thirty (30) Days after the date of the issuance of the First Chargeable Date.
 - 1. Section 05 Baseline Project Schedule
 - 2. Section 19 Construction and Demolition Debris Management Plan

20.01.03. Special Review Cycle

- A. No Special Requirements.

20.01.04. Copies

- A. The number of copies of submittals described herein supersedes the submittal copy requirements described in Standard Provisions Article 7.05. Submittals to be Furnished by the Contractor and in Article 9.12.02. Product Data and Samples.
- B. The number of copies required is as follows: Shop Drawings and product data: Sufficient copies to allow five (5) copies to be retained by the Engineer plus one (1) copy to be returned to the Contractor for the Contractor's use.

1. Samples: Sufficient numbers to allow two (2) samples of all structural and architectural products involving color, finish, texture, etc. and one (1) sample of other products to be retained by the Engineer plus one (1) sample to be returned to the Contractor for the Contractor's use.
2. It shall be the Contractor's responsibility to copy and/or to conform reviewed submittals in sufficient numbers for its files and for Subcontractors and vendors.
3. For up to 20 selected submittals, the Engineer shall request additional copies of a submittal for use by the Engineer and by District but no more than ten (10) copies in total. The Contractor shall provide these additional copies.

20.02. Exclusive Testing by the District

- A. No Special Requirements.

20.03. Additional Testing Certifications

- A. Notify the Engineer when mechanical, HVAC and Fire Alarm and Suppression systems are complete, all pre-testing punch-lists have been satisfactorily completed and all adjustments have been made. Notify Engineer at least 72 hours in advance and perform final tests as described herein, or by the manufacturer's literature and recommendations in the presence of the Engineer. Demonstrate that contract requirements of individual components, or complete systems comply with the contract documents, manufacturer's recommendations and/or District parameters.
- B. Corrective work identified as a result of the testing results shall be done at no additional cost.

20.04. Contractor's Quality Control**20.04.01. Quality Control Plan**

- A. The Contractor is not required to prepare and submit a Project-Specific Quality Control plan.
- B. However, the Contractor is required to comply with its Quality Control program as outlined in Article 9.03. Contractor's Quality Control Program.

20.04.02. Contractor's Quality Control Staffing Requirements

- A. The Contractor shall have a qualified Field QC Representative responsible for QC who is on-site whenever permanent Work is being performed. This Field QC Representative shall report directly to a senior manager of the Contractor to ensure organizational freedom, identify quality problems, and initiate and recommend solutions. The QC plan submittal shall include a letter signed by a principal officer of the Contractor's firm designating the Field QC Manager and specifying the authority delegated to the Field QC Manager to direct cessation or removal and replacement of defective Work. The Contractor shall maintain QC over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality. Testing and inspection shall not relieve the Contractor of its responsibility for quality of Material in place.

20.04.03. Payment

- A. Full compensation for doing all Work necessary to provide quality control shall be included in the Contract Price(s) for various items of Work involved; no separate payment shall be made.

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SECTION 21. PAYMENT PROCEDURES

21.01. Bid Items

21.01.01. General Requirements

- A. Refer to Bid Documents Bid Form No. 1 Bid items for the listing of Bid items.
- B. Unless otherwise indicated, all Bid Items include labor, Material, Equipment, and incidentals in accordance with the Drawings and Specifications to complete the Work.
- C. No separate payment will be made for any Work included in the Drawings and/or Specifications but not specifically set forth in the listing of Bid items. All costs shall be included in a Bid item.
- D. Where there is an overlap in the Work paid for under different Bid items, the Work will be paid for only once under the appropriate Bid item(s), as determined by the Engineer.

21.01.02. Description of Bid Items

- A. Bid Item No. 1—Mobilization/Demobilization
 - 1. Scope of Work: This Bid item shall include the preconstruction meeting, all preparatory Work, and appurtenant preconstruction operations, including, but not limited to, those necessary for the movement of personnel, Equipment, supplies, and incidentals to the Project site; building and removing any temporary construction areas; installation and removal of temporary facilities necessary for Work on the Project; and demobilization including final clean up off the project site and other Work as specified in these Specifications.
 - 2. Measurement and Payment: Full compensation for furnishing all Work and Material for mobilization and demobilization shall be included in the lump sum bid price for Bid Item No. 1. Mobilization/Demobilization.
- B. Bid Item No. 2—Removal and Disposal of Existing Fire Control Facilities
 - 1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to demolish, remove, dispose of all existing facilities as shown on the Drawings and as specified in these Specifications. This bid item shall include but is not limited to the complete removal and disposal of the existing fire control facilities.
 - 2. Measurement and Payment: Full compensation for furnishing all Work and Material for Removal and Disposal of Existing Fire Control Facilities shall be included in the lump sum bid price for Bid Item No. 2, Removal and Disposal of Existing Fire Control Facilities.

- C. Bid Item No. 3 — 4-inch Mechanical Pipeline
1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to install approximately 300 linear feet of 4-inch diameter mechanical pipeline and associated appurtenances as shown on the Drawings and as specified in these Specifications.
 2. Measurement and Payment: Full compensation for furnishing all Work and Material for the installation of 4-inch diameter Mechanical Pipeline and associated appurtenances shall be included in the lump sum bid price for Bid Item No. 3, 4-inch diameter Mechanical Pipeline.
- D. Bid Item No. 4 — Clean Agent Fire Suppression System
1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to install Clean Agent Fire Suppression System as shown on the Drawings and as specified in these Specifications.
 2. Measurement and Payment: Full compensation for furnishing all Work and Material for the installation of Clean Agent Fire Suppression System shall be included in the lump sum bid price for Bid Item No. 4, Clean Agent Fire Suppression System.
- E. Bid Item No. 5 — Fire Alarm System
1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to install Fire Alarm System as shown on the Drawings and as specified in these Specifications.
 2. Measurement and Payment: Full compensation for furnishing all Work and Material for the installation of the Fire Alarm System shall be included in the lump sum bid price for Bid Item No. 5, Fire Alarm System.
- F. Bid Item No. 6 — Fire Department Standpipe Connection
1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to install Fire Department Standpipe Connection as shown on the Drawings and as specified in these Specifications.
 2. Measurement and Payment: Full compensation for furnishing all Work and Material for the installation of Fire Department Standpipe Connection shall be included in the lump sum bid price for Bid Item No. 6, Fire Department Standpipe Connection.

G. Bid Item No. 7 — Retrofit Fire Hose Nozzles

1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to install Retrofit Fire Hose Nozzles as shown on the Drawings and as specified in these Specifications.
2. Measurement and Payment: Full compensation for furnishing all Work and Material for the installation of the Retrofit Fire Hose Nozzles shall be included in the lump sum bid price for Bid Item No. 7, Retrofit Fire Hose Nozzles.

H. Bid Item No. 8 — Signage and Emergency Lighting

1. Scope of Work: This bid item shall include furnishing all supervision, labor, materials, tools, equipment, and incidentals necessary to install the Signage and Emergency Lighting and associated appurtenances as shown on the Drawings and as specified in these Specifications.
2. Measurement and Payment: Full compensation for furnishing all Work and Material for the installation of Signage and Emergency Lighting shall be included in the lump sum bid price for Bid Item No. 8 Signage and Emergency Lighting.

21.02. Progress Payments and Schedule of Values

- A. The Contractor's attention should be directed to the Standard Provisions, Section 6, Measurement and Payment.

21.03. Progress Payment Retention

- A. The Contractor's attention should be directed to the Standard Provisions, Section 6.02.04.F.

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SECTION 22. CONTRACT CLOSEOUT

22.01. Project Completion and Acceptance

22.01.01. Use Before Acceptance

- A. Refer to Article 11.01.01, Use Before Acceptance.

22.01.02. Milestone Completion Preliminary Final Inspection

- A. Refer to Article 11.01.03, Milestone Completion and Preliminary Final Inspection

22.02. Guarantee and Guaranty Bond

- A. Refer to Article 11.02 Guarantee and Guarantee Bond

22.03. Training

- A. This Article includes requirements for training District staff on the Equipment, products, and systems furnished under these Contract Documents, including Contractor video recording of training instruction.

22.03.01. General Requirements

- A. The objective of training included under this Article shall be to convey the knowledge needed by District operations, maintenance, and engineering staff to safely operate, maintain, and repair the Equipment and systems furnished under this Work. Focus training to the skills and job classifications of the staff attending the classes (e.g., water treatment plant operator, maintenance technician, and electrician). Provide supporting documentation to assist the instruction learning process and to serve as a source of information to District staff after training. Provide video of training sessions to be used to train District staff who could not attend the scheduled sessions.
- B. Unless specifically noted otherwise, conduct all training in accordance with the following general requirements. Facilities and equipment shall be fully functional before training begins.
 - 1. Scheduling of classes: Training shall be planned in accordance with the accepted Detailed Progress Schedules. The Engineer must approve and confirm class schedules. All classes shall be scheduled in Detailed Progress Schedules.
 - 2. Schedule specific classes a minimum of three (3) weeks in advance to allow District staffing arrangements to take place. Generally, not more than two (2) classes per week shall be scheduled. Classes shall be provided during the time periods of 8 a.m. to 5 p.m. Monday through Friday as requested by the District.

3. Class agenda: Prepare a class agenda and submit it to the Engineer at least four (4) weeks in advance of the date of the first corresponding class. The agenda shall include (i) a listing of subjects to be discussed, (ii) the training goal(s), (iii) the methods to be used to achieve the training goal(s), (iv) time estimated for each subject, (v) a list of documentation to be used or provided to support training, (vi) a period for the instructor to question staff members to ensure that the training was successful, (vii) and the instructor's name. Agendas shall include an allocation of time for District staff to ask questions and discuss the subject matter. The District may request that particular subjects be emphasized, and that the agenda be adjusted to accommodate these requests. Copies of the agenda shall be distributed to each student at the beginning of each training class.
4. Number of students: It is estimated that 10 persons will attend each training class. The actual number of students will be determined by the District. The Engineer will provide an estimated headcount two (2) Days prior to the class if requested by the Contractor.
5. Training location: Unless otherwise noted, all training will be conducted at indoor, on-site training facilities. If necessary and appropriate as determined by the Engineer, training will be conducted at off-site locations or at the actual installed location of the Equipment, product, or system as approved by the Engineer. Training facility will be provided by the District.
6. Length of training: Each class shall be planned to be completed within 8 hours and shall include one 20-minute break for each 4-hour training period. Requests for longer class periods must be approved by the Engineer.
7. Instructor qualifications: Instructors shall be completely knowledgeable in the products and systems for which they are providing training and experienced in conducting classes. Sales representatives are not qualified instructors unless they possess the detailed operating and maintenance knowledge required for proper class instruction. If, in the opinion of the Engineer, the scheduled training was not provided by an appropriately knowledgeable person, such training shall be rescheduled and repeated with a suitable instructor at the Contractor's expense.
8. Training aids: Each instructor is encouraged to use audio/video devices, models, charts, etc. to increase the transfer of knowledge. The business conducting the training shall provide all such Equipment (televisions, video cassette recorder/player, Projectors, screens, easels, etc.); models; charts; etc. for each class. It shall be the responsibility of the business conducting the training to confirm in advance that the classroom is appropriate for the types of audio/video Equipment to be used.

9. Training at the actual Equipment (hands-on) shall be a part of each class. This portion of the instruction shall include operation, preventative maintenance points, calibration (wherever applicable), troubleshooting, common repairs, and manufacturer-recommended servicing.
10. Classroom documentation: For training on Equipment, systems, or products for which the Contractor is required to provide an O&M manual, a complete O&M manual shall have been submitted per Special Provisions Article 14.10.02. Submittal Schedule and shall be used during the classroom instruction. Supplemental documentation handouts shall be provided to support the instruction.
11. Contractor shall provide audio/video recording of each class with appropriate lighting to document the training. Recording shall take place during all portions of the instruction, including at the actual Equipment. Questions from students and their answers shall be recorded to the extent feasible. Each class shall be video recorded if more than one (1) class is taught. The District acknowledges that the manufacturer's written operation and maintenance documentation takes precedence over the classroom training (including viewing of the video) and will be consulted prior to and during maintenance and operations. The Contractor shall submit a separate electronic copy of each class recording within two (2) weeks of the completed training date. Each recording shall be affixed with a word-processed label stating at a minimum:
 - a. the subject;
 - b. date of class;
 - c. company providing the training;
 - d. reference Specification Section; and
 - e. a summary of class subjects.
12. Video recordings that are incomplete or that are not readily audible or clear shall require the class to be repeated with new video recording.
13. District video recordings, photographing, audio recording, and other documentation of training classes: In addition to video recordings being completed by the Contractor, the District reserves the right to videotape, photograph, audio record, and otherwise document any or all training classes provided under this Work. The business(es) conducting the training and the Contractor shall cooperate with the District in making such video recordings, photographs, or audio recordings, which shall remain the exclusive property of the District.

14. If the instructor cannot answer relevant product questions by students during the training, these questions shall be recorded by the instructor and a written response shall be submitted to the Engineer within three (3) weeks.
- C. Additional training requirements for specific Equipment and systems may also be specified in these Specifications.
- D. Training list: Contractor shall submit a list of all Equipment, systems, and processes that require training. For each item, identify (i) the type of training (maintenance or operations); (ii) duration of each class in consecutive Days; (iii) number of classes per Day; (iv) total number of classes; and (v) minimum number of instruction hours per class.

22.03.02. Submittals

- A. Submit an overall schedule of all classes to the Engineer at least six (6) weeks in advance of the date of the first class.
- B. Submit a list of all training required in accordance with Article 22.03.01. General Requirements, paragraph D.
- C. Submit class agendas to the Engineer in accordance with this Article.

22.04. Testing and Facility Start-Up

- A. The Contractor shall notify the Engineer when mechanical, HVAC and Fire Alarm and Suppression systems are complete, all pre-testing punch-lists have been satisfactorily completed and all adjustments have been made. Notify Engineer at least 72 hours in advance and perform final tests as described herein, or by the manufacturer's literature and recommendations in the presence of the Engineer. Demonstrate that contract requirements of individual components, or complete systems comply with the contract documents, manufacturer's recommendations and/or District parameters.
- B. Corrective work identified as a result of the testing results shall be done at no additional cost.

22.05. Submission of Closeout Items

- A. At completion of construction and prior to issuance of the Project Completion letter by the Engineer, the Contractor shall deliver to the Engineer the closeout Documents described in Standards Provisions Section 11 Contract Closeout.

22.06. Final Cleaning

- A. Structures that are to be cleaned by a professional industrial janitorial service as specified in Standard Provisions Section 11 Contract Closeout include:
 1. Pumping Plant

TECHNICAL PROVISIONS

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TECHNICAL PROVISIONS

DIVISION 10.14 IDENTIFYING SIGNAGE

DIVISION 10

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Scope:

1. Article Includes: "Not An Exit" Signs

1.02 REFERENCES

A. Referenced Standards:

1. American National Standards Institute (ANSI), ICC A117.1 - 2009, "Accessible and Usable Buildings and Facilities".
2. National Fire Protection Association (NFPA) NFPA 704, "Standard System for the Identification of the Hazards of Materials for Emergency Response".

B. Regulatory Requirements:

1. Americans with Disabilities Act (ADA).
2. 2016 California Building Code, CCR Title 24, especially Chapter 11B.
3. California Code of Regulations, CCR Title 8, CAL/OSHA.

1.03 SUBMITTALS

A. The following information shall be submitted for review in accordance with Section 7.05 of the Standard Provisions:

1. A copy of this Article, with addenda updates, with each paragraph check marked to show Specification compliance or marked to show deviations.
2. Show Drawings:
 - a. Product Technical Data including manufacturer's installation instructions.
 - b. Schedule of all signs indicating text and graphics.
 - c. Layout drawings of all signage showing size, letter style, text, border, finish and installation detail.
 - d. Provide drawings for indicating mounting location: "Not An Exit" signs

- e. Samples: "Not An Exit" signs - provide one full size representative sample of each signage type, made of the specified material, from Part 2 of this Specification. Provide manufacturer's standard color palette for each selection.

1.04 OPERATION AND MAINTENANCE INSTRUCTIONS (NOT USED)

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. The Exit Light Company
 - 2. Seton Signs
 - 3. Best Sign Systems
 - 4. Or equal

2.02 MATERIALS

- A. A. Plastic Signs: Explosion proof semi-rigid acrylic plastic, minimum 5-1/2" wide x 6- 1/2" high. Non-glare, matte finish with subsurface printed graphics and color that cannot be scratched off.
- B. B. Vinyl Signs: Signs shall be adhesive-backed vinyl material.

2.03 FABRICATION

- A. "Not An Exit" Signs:
 - 1. General:
 - a. Plastic with 1/8" diameter mounting holes at corners and # 4 stainless steel screws for door-mount locations.
 - b. Vinyl with adhesive-backing for wall mount locations.
 - 2. Specifics:
 - a. Finish: Non-glare, matte.
 - b. Color: Red pictogram with black lettering on white field
 - c. Typeface: Sans Serif 1-inch high, minimum.
 - d. Text: "Not An Exit"

- e. Pictogram: Circle with diagonal slash over figure running through opening.
- f. All signs shall comply with requirements of California Title 24.

PART 3 PRODUCTS**3.01 GENERAL (NOT USED)****3.02 INSTALLATION**

- A. Install where indicated on the Drawings.
 - 1. Install plastic signs on one side of door face only ("public" side and as shown on Drawings). Install vinyl sign on wall adjacent to stairwell leading to lower level (and as shown on Drawings).
 - 2. Bottom of plastic and vinyl signs to be mounted at 5'-0" above finished floor.
 - 3. Door signs to be centered on door.
 - 4. Wall mount sign to be centered on landing at top of stairs.

3.03 TESTING (NOT USED)**3.04 TRAINING (NOT USED)**

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ARTICLE 31.01 SEISMIC REQUIREMENTS

SECTION 31

PART 1 GENERAL

1.01 SUMMARY

- A. This Article is applicable to the following secondary structural system elements, non-structural components, and/or equipment supported by structures.
 - 1. Fire Protection System Piping
 - 2. Fire and Smoke Detection Devices
 - 3. Fire Alarm Notification Devices
 - 4. Fire Alarm Panels
 - 5. Conduit, cable trays, raceways, ducts and similar systems.
 - 6. All equipment specifically listed in this specification.

1.02 REFERENCES

- A. American Society of Civil Engineers Standard ASCE 7-16, Minimum Design Loads for Buildings and Other Structures, Chapters 11, 13, 15.
- B. California Building Code (CBC), 2016 Edition, Section 1613

1.03 DEFINITIONS

- A. Engineer of Record: The Design Engineer responsible for the preparation of Contract Documents.
- B. Specialty Engineer: Structural or Civil Engineer licensed in the State where the project is being built responsible for specific elements of the primary structural system, the secondary structural system, non-structural elements and/or equipment supported by structures. The Specialty Engineer shall be provided by the Contractor.

1.04 GENERAL DESIGN REQUIREMENTS

- A. The Contractor and Specialty Engineer are responsible for producing structural designs that resist applicable loads including: Dead, Live, Seismic, Fluid, operational, or other special loads applicable to the component being designed.
- B. Minimum design loads shall be based on guidelines given in this Article, the Drawings, ASCE 7-16, CBC Chapter 16, equipment manufacturer's recommendations and/or other industry accepted design standard for the component being designed (i.e. AWWA D100, API 650, ANSI MH16.1).

1.05 SEISMIC DESIGN REQUIREMENTS

- A. The Contractor is responsible for producing designs that resist the total seismic forces in accordance with the seismic design criteria. The Contractor is

responsible for coordinating between the Engineer of Record and the Specialty Engineer. The Contractor is responsible to coordinate the favorably reviewed design in the field, and shall provide the proposed design, including any modifications required to the primary structure, at no additional cost to the owner.

- B. The seismic design for non-structural components and equipment shall be in accordance with the CBC Chapter 16, and the required coefficients and factors for determining the total design seismic forces are provided in the Seismic Design Criteria in Paragraph D below.
- C. Coordinate the layout so that adequate space is provided between items for relative motion. Provide additional supports and restraints between items of different systems when necessary to prevent seismic impacts or interaction.
- D. Total seismic forces shall be determined in accordance with the following seismic design criteria coefficients for elements of structures, non-structural components, equipment supported by structures, and nonbuilding structures:
 - 1. Spectral Acceleration 1-Second Period, SD1 = per Section 1613.5.4
 - 2. Spectral Response Acceleration at Short Period, SDS = per Section 1613.5.4
 - 3. Seismic Design Category = F
 - 4. Importance Factor, $I_e = 1.50$
 - 5. Component Importance Factor, $I_p = 1.5$
 - 6. Components Coefficient:

Element or Equipment	Non-Structural Components and Equipment (ASCE 7, Table 13.6-1 reference)	a_p	R_p
Fire Protection System Piping (grooved, threaded connections)	Distribution Systems	2.5	6.0
Fire Protection System Piping (welded connections)	Distribution Systems	2.5	12.0
Fire Alarm Cabinets	Mechanical And Electrical Components (Instrumentation Cabinets)	2.5	6.0
Fire/Smoke Detection Devices	Mechanical and Electrical Components (Instrumentation)	1.0	2.5
Fire Alarm Notification Devices	Mechanical And Electrical Components (Communication Equipment)	1.0	2.5
Electrical Conduit (power and signal)	Electrical Conduit and Cable Trays	2.5	6.0

- E. Design anchorages of all elements of structures, nonstructural components, and equipment supported by structures, to resist static and dynamic operational loads, plus total seismic loads specified in the CBC, ASCE 7-10 Section 13.3.1, and as follows:
 - 1. For suspended equipment, multiply dead load by 1.2 and add 0.2 SDS to account for vertical seismic effects in the downward direction.
 - 2. For anchorage uplift, multiply dead load by 0.9 and subtract 0.2 SDS if used to reduce vertical seismic effects.
 - 3. Post-installed anchors installed in concrete shall be prequalified for seismic application in accordance with ACI 355.4 and ICC ES AC 308. Include product name and ESR number.
- F. Design Basis and Coordination: Contractor shall note that the layout of the structure and equipment pads is based on the first named manufacturer and model for the equipment to be anchored.
 - 1. Contractor shall coordinate all attachments and related work and shall provide connections as noted in the favorably reviewed Shop Drawings.
 - 2. For all suppliers, if the dimensions required by the Contractor's submitted anchorage calculations deviate from those provided on the Contract Drawings, Contractor shall note the deviation in the submittal for review and provide the favorably reviewed pad at no additional cost to the Owner.
 - 3. If a model or manufacturer other than the first name supplier is submitted for use by the Contractor, Contractor shall coordinate all related work and deviations from the Contract Drawings.
 - 4. Where Contractor's Specialty Engineer proposes a deviation from the contract drawings for any manufacturer, and that deviation is favorably reviewed by the Engineer, Contractor shall provide that modification to the structure at no additional cost.

1.06 DESIGN REQUIREMENTS FOR PIPING, CONDUIT, AND DUCTS

- A. The Contractor is responsible for producing designs for support of piping, conduit, duct or other systems to resist total seismic forces based on the seismic design criteria coefficients specified above, unless shown on the Contract Documents. Except where the technical specifications give specific exemption from resistance of seismic forces, all supports shall be designed to meet seismic criteria.
- B. Where possible, pipes, conduit, and their connections shall be constructed of ductile materials (e.g., copper, ductile-iron, steel or aluminum and brazed, welded or screwed connections). Pipes, conduits and their connections,

constructed of nonductile materials (e.g., cast-iron, no-hub pipe and plastic), shall have the brace spacing reduced to one-half of the spacing allowed for ductile material.

- C. Seismic restraints may be omitted for the following conditions, where flexible connections are provided between components and the associated ductwork, piping and conduit:
 - 1. Electrical conduit less than 2.5 inches trade size or raceways supported by individual hangers 12 inches or less in length from raceway support point to the bottom of the structural support for the hanger, where the hangers are detailed to avoid bending of the hangers and their connections.
- D. All trapeze assemblies supporting pipes, ducts and conduit shall be braced to resist the total seismic forces considering the weight of the elements on the trapeze. Pipes, ducts and conduit supported by a trapeze where none of those elements would individually be braced need not be braced if connections from the pipe/conduit/ductwork to component or directional changes do not restrict the movement of the trapeze. If this flexibility is not provided, bracing will be required when the aggregate weight of the pipes and conduit exceed 10 pounds/foot or ducting exceeds 17 pounds/foot. The weight shall be determined assuming all pipes and conduit are filled with water.
- E. As an alternative to designing the supports and anchorage, where an approved national standard provides a basis for the earthquake-resistant design, submit standard, data, and details for piping, conduit, duct or other systems:
 - 1. For ductwork, mechanical piping, process piping and electrical conduits, follow Guidelines for Seismic Restraints of Mechanical Systems by SMACNA modified as follows:
 - a. Seismically brace piping regardless of size or location. Provide transverse braces at all changes in direction and at the end of all pipe runs. Space transverse braces not more than 20 feet apart. Provide longitudinal braces at 40-foot centers.

1.07 SUBMITTALS

- A. Submit in accordance with Article 3.01 – General Conditions, paragraph 1.03 and this section.
- B. Shop Drawings for non-building structures and contractor designed components: Submit signed and sealed structural calculations and detailed drawings for the following listed elements, the primary structural system and their attachments, the secondary structural system and their attachments, permanent non-structural components and their attachments, and the attachments and anchorage for permanent equipment supported by the structure:

1. P-14 Electrical Distribution Enclosure Support Structure
- C. Seismic Certification of Equipment:
 1. Certification is required for the following elements or components:
 - a. List items in accordance with note to specifier above
 - b. Any components or equipment where the component importance factor I_p is designated as greater than 1.0.
 2. Certification may consist of one of the following methods:
 - a. Project-specific component design and documentation determined to be acceptable by the Engineer and the authority having jurisdiction.
 - b. Written certification from the manufacturer that the equipment can resist the internal seismic loads due to the loading conditions noted herein and meeting the requirements based on one of the following:
 - (1) Analysis, where Section 13.2.2 allows, or
 - (2) Testing meeting ASCE 7-10 Section 13.2.5, or
 - (3) Experience Data meeting ASCE 7-10 Section 13.2.6.
 3. Level 2 Certification shall consist of a written certification from the manufacturer, and accompanying test results or experiential evidence, indicating compliance with ASCE 7 Chapter 13.2.2.
 4. For elements designed using Chapter 15, Contractor shall submit complete calculations for the element or non-building structure in lieu of seismic certification.
- D. Shop Drawings for Anchorage Calculations: Where required in the equipment specifications in Articles 32 and 36, or listed below, submit signed and sealed structural calculations and detailed drawings from the Contractor's Specialty Engineer.
 1. Required anchorage items include:
 - a. Fire Alarm Cabinets
 - b. P-14 Electrical Distribution Enclosure Support.
- E. Structural calculations and detailed drawings shall be prepared by the Contractor's Specialty Engineer.
- F. Structural calculations and detailed drawings shall clearly show the total design seismic forces which will be transferred from the elements of the structural system, non-structural components, and/or equipment and their attachments to

the primary structure. Calculations must be reviewed by Engineer of Record for general conformance with the design criteria and building code and therefore calculations shall include:

1. Seismic and wind load criteria used to determine design lateral and uplift forces. For external equipment, a statement should be made as to whether wind controls for all equipment.
 2. Derivation of forces used, including at least one complete sample calculation, showing the process used so that Engineer of Record may determine general compliance. Printouts of spreadsheets without explanation of calculations used to determine values are not acceptable.
 3. Adequacy of anchorage to concrete and masonry or attachment to the primary structure to transfer the design forces from the element.
 4. Detail drawings shall note:
 - a. Required concrete strength.
 - b. Anchor type, manufacturer, ESR number, and adhesive, if used, dimensions, and materials. Refer to products identified on the design drawings.
 - c. Edge distance, spacing, embedment depth, substrate thickness and any supplementary reinforcing required for anchors installed in concrete. Note upwardly-inclined and overhead applications where applicable. Include driving methods.
 - d. Required dimensions of equipment pads based on equipment size and edge distance. The Contractor shall coordinate dimensions of equipment pads, including any revisions required to meet the requirements of the favorably reviewed submittal by the Specialty Engineer at no additional cost to the Owner.
- G. The Engineer of Record's review of items within a Specification Section cannot be completed until all related items have been coordinated and submitted for review.
- H. Quality Assurance Submittals:
1. Verification of installation: Submit a letter from the Contractor's Specialty Engineer verifying that the installation was performed as required by the Specialty Engineer's calculations.

1.08 QUALITY ASSURANCE

- A. Qualifications: The Contractor is responsible for submitting signed and sealed structural calculations and detailed drawings from a Specialty Structural or Civil Engineer licensed in the state where the project is being built.
- B. Regulatory Requirements: Comply with the California's adopted and amended versions of the CBC Section 1613, the referenced sections of ASCE 7 plus clarifications and additions specified in this Section.

PART 2 PRODUCTS (NOT USED)**PART 3 EXECUTION (NOT USED)****PART 4 FIELD QUALITY CONTROL****4.01 GENERAL REQUIREMENTS**

- A. Use all means necessary to protect equipment before, during and after installation in accordance with manufacturer's storage, installation, and maintenance instructions.
- B. Site Tests: Tension testing of expansion or adhesive anchors utilized for anchorage shall be done in the presence of the Specialty Inspector under the employment of the District, who shall prepare a report of the test results. Refer to drawings for additional requirements
- C. Inspection: The Specialty Inspector under the employment of the District shall be present for the installation of high strength bolting and the drilling and setting of bolts installed in concrete. Contractor shall provide notice to District at least two weeks prior to scheduled installation.

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ARTICLE 32.01 GENERAL EQUIPMENT AND MECHANICAL REQUIREMENTS

SECTION 32

PART 1 GENERAL

1.01 SUMMARY

- A. Article Includes: The general requirements for all of the Equipment and Mechanical work in the scope of the Project, included in Article 32, and elsewhere wherever specifically mentioned in these Specifications.
- B. Direct the attention of all subcontractors and suppliers of equipment and related appurtenances for the work to the applicable provisions in the Contract Documents wherever they may occur.

1.02 REFERENCES

- A. American Gear Manufacturers Association (AGMA).
- B. American Institute of Steel Construction (AISC).
- C. Hydraulic Institute.
- D. National Electrical Manufacturers Association (NEMA).
- E. Occupational Safety and Health Act (OSHA).
- F. California Code of Regulations, Title 8 Industrial Relations (CAL/OSHA).

1.03 STANDARDS FOR THE WORK

- A. Complete Systems: Provide pipe, fittings, wiring, and supports to produce complete, operable systems with all elements properly interconnected. If a specific dimensioned location is not shown for interconnections or smaller system elements, select appropriate locations and show them on Shop Drawing submittals for review.
- B. Provide equipment and material new and without imperfections. Erect in a neat and workmanlike manner; aligned, leveled, cleaned and adjusted for satisfactory operation; installed in accordance with the recommendations of the manufacturers and the best standard practices for this type of work so that connecting and disconnecting of piping and accessories can be readily made and so that all parts are easily accessible for inspection, operation, maintenance, and repair. Locate oil and lubrication fittings clear of and away from guards, base, and equipment and within reach from the operating floor. Coordinate location of all motor connections in order to properly orient encased electrical conduits. In order to meet these requirements with equipment as furnished, minor deviation from the Drawings may be made as favorably reviewed by the Engineer.
- C. The recommendations and instructions of the manufacturers of products used in the work are hereby made part of these Specifications, except as they may be superseded by other requirements of these Specifications.

1.04 SUBMITTALS

- A. Shop Drawings: Show sizes and arrangement of equipment, foundations, and anchor bolts required; performance characteristics; control diagrams; wiring diagrams; methods of assembly; pipe hanging details; ductwork layouts; and connections to other work. Date and sign drawings as certified for use in construction of this project. The arrangement of mechanical equipment and appurtenant piping shown on the Drawings may be varied as necessary to fit the favorably reviewed certified manufacturer's installation drawings. However, manufacturers' drawings shall not deviate in substance from the Contract Drawings and Specifications as to location, size, type, and design of equipment. The following minimum requirements shall accompany all equipment submissions:
1. Overall dimensions.
 2. Mounting arrangement and dimensions.
 3. Description of materials.
 4. Connection sizes and orientation.
 5. Capacity and location of lifting eyes.
 6. Rating data: Mechanical and Electrical as applicable.
 7. Detail electrical wiring diagrams, showing component designation and rating.
 8. Seismic design certifications and anchorage descriptions as required by Section 31.01 and as indicated on the Drawings.
 9. List of special tools and/or spare parts to be furnished, if any.
- B. Each piece of equipment, for which certified witnessed or non-witnessed performance tests are required, shall be accompanied by a completed form containing at least the following information:
1. Owner's name and location of project.
 2. Contractor's name and subcontractor if applicable.
 3. Name of item being submitted.
 4. Specification reference by article, paragraph and page.
 5. Data on item (manufacturer, general descriptive data, dimensions, size of connections, speeds, performance curves, serial number). A specific list of the test results plus a list, which shows the values that differ from Specifications.

- 6. Motor data, type, voltage, frequency, phase, full load amperes, starting method, frame size, enclosure insulation type (NEMA Code letter), dimensions, service factor, serial number.
- 7. Date and signature of person certifying the performance.
- C. Operations and Maintenance Manuals: Prepare and submit manuals covering installation, operation and maintenance of all equipment and machinery specified in Section 14.10.05.
- D. Manufacturers' Affidavits: Where called for in the Specifications, each equipment manufacturer, or their authorized representative, shall submit an affidavit of compliance that the stated materials have been installed in conformance with the Contract documents.

1.05 RESPONSIBILITY AND CARE OF EQUIPMENT

- A. The Contractor shall be responsible for the equipment included in this Contract until it has been finally inspected, tested, and accepted in accordance with the requirements of these Specifications.
- B. The Contractor shall make his own provisions for properly storing and protecting all material and equipment against theft, injury, or damage from any and all causes. Damaged material and equipment shall not be used in the work.

PART 2 PRODUCTS

2.01 DESIGN

- A. General: Design all equipment for the service intended, of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection, and during continuous or intermittent operation. Adequately stay, brace and anchor, and install equipment in a neat and workmanlike manner. Give consideration to appearance and safety, as well as utility, in the design of details. Use cathodically compatible materials of construction.
- B. Seismic: Refer to Article 31.01 of the Specifications for the seismic design criteria.
- C. Controls: Unless noted otherwise, the design of the electric control of any equipment system and/or equipment package shall be the responsibility of the manufacturer of the equipment system and/or equipment package. The elementary control diagrams as shown on the Electrical Drawings and the diagrams shown on the Instrumentation Drawings are illustrative of control and monitoring requirements pertaining to various equipment of this project. The manufacturers shall design their own functional electric control devices and circuitry, in consultation with the specific elementary control diagrams and other project specifications, to meet the equipment control requirements. All such systems and package controls shall be furnished by the equipment manufacturer,

except that controls shown in motor control centers and process controllers, remote control devices, and their interconnecting wiring shall be provided under Article 36. Provide heating, ventilating, and air conditioning controls, both 24-volt and line voltage type, by a HVAC controls specialist.

2.02 MATERIALS AND STANDARD SPECIFICATIONS

- A. Materials: Design, fabricate, and assemble equipment and systems with new materials and in accordance with acceptable modern engineering and shop practices. Manufacture individual parts to standard sizes and gauges so repair parts can be installed in the field.
- B. Uniformity: Unless otherwise specified, equipment or material of the same type or classification used for the same purpose shall be the product of the same manufacturer and shall be the same model.

2.03 LUBRICATION

- A. Provide lubricants of types recommended by equipment manufacturers, in quantities sufficient for consumption prior to completion, testing and final acceptance.

2.04 STRUCTURAL METAL FRAMING

- A. Details of fabrication shall be in accordance with the Drawings.

2.05 EQUIPMENT BASES AND BEDPLATES

- A. Mount equipment assemblies on a single heavy cast iron or welded steel bedplate unless otherwise shown or specified. Provide bases and bedplates with machined support pads, tapered dowels for alignment or mating of adjacent items, adequate openings to facilitate grouting, and openings for electrical conduits. Round or chamfer and grind smooth all corners. Continuously weld seams and contact edges between steel plates and shapes, and grind welds smooth. Do not support machinery or piping on bedplates other than that which is factory installed. Provide jacking screws in equipment bases and bedplates to aid in leveling prior to grouting. Mount all equipment bases and baseplates on reinforced concrete pads at least 3 inches high.

2.06 ANCHORS

- A. Each equipment manufacturer shall furnish an anchor bolt pattern and the required anchor bolts, nuts, and washers of adequate design for securing bases and bedplates to concrete bases. Provide anchor bolts of length to allow for 1 ½-inch of grout under baseplates and adequate anchorage into structural concrete unless otherwise shown or specified.
- B. Provide anchor and assembly bolts and nuts of ample size and strength for the purpose intended. All bolts shall be standard machine bolts, with cold pressed

hexagon nuts. Provide suitable degauling compounds for bronze and stainless steel threaded components. Any space wholly or partially underground, or having a wall or ceiling forming part of a water channel, is classified as a moist location. Unless otherwise specified or noted on the Drawings, provide materials as follows:

1. Bolts and nuts in submerged locations or submerged and embedded in concrete or buried in earth: Type 304 stainless steel.
 2. Bolts and nuts for supports or equipment in dry or moist locations: Galvanized steel (hot-dipped), with oversize nuts.
 3. Use other bolting materials where specifically called for in the Specifications or on the Drawings.
- C. Anchor all motor-driven equipment with cast-in-place anchor bolts or drilled-in anchors set with epoxy adhesive. Do not provide expansion type anchors for motor-driven equipment.
- D. Anchor all non-motor-driven equipment with cast-in-place anchor bolts or drilled-in anchors set with epoxy adhesive except that, where specifically allowed by note on the Drawings, expansion type anchors may be used.
- E. Refer to Article 31.01 for technical specification requirements for cast-in-place and post-installed anchors.

2.07 SAFETY GUARDS

- A. Cover all pipes, manifolds, heaters, and other surfaces which have a surface temperature sufficient to burn human tissue with a thermal insulating material or otherwise guard against contact.
- B. Guards to comply with OSHA and local requirements or CCR Title 8 CAL/OSHA 3940 through 3944.

2.08 LIFTING EYES

- A. Supply all equipment weighing over 100 pounds with lifting eyes. Parts of equipment assemblies which are normally serviced separately, such as motors, to have lifting eyes of their own.

2.09 NAMEPLATES

- A. Manufacturer's Nameplate: Furnish each piece of equipment and its driver with a corrosion-resistant metal nameplate fastened to the item in a readily readable position. This nameplate to contain the manufacturer's name, equipment rating, capacity, size, model, serial number, and speed. All information written or printed to be in English.

- B. Direction of Rotation: Furnish each piece of rotating equipment with a direction of rotation arrow.
- C. Functional Identification: Label each piece of equipment using a plastic laminate label with the functional name and number of the equipment.
 - 1. Fasten labels to the equipment, its base, or other acceptable location:
 - a. Letters: At least ½-inch high with the border trim on all sides not less than ¼-inch.
 - b. Color: Green background with white letters.
 - c. Fasteners: Brass or stainless steel screwed into inserts, anchor shields, or tapped holes in equipment or base.

2.10 PROTECTION AGAINST ELECTROLYSIS

- A. Where dissimilar metals are used in conjunction with each other, provide suitable insulation between adjacent surfaces so as to eliminate direct contact and any resultant electrolysis. Connections of dissimilar piping materials shall utilize dielectric unions, flanges, couplings, or bushings.

2.11 SPECIAL TOOLS

- A. For each type of equipment to be furnished, provide a complete set of all special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, and maintenance of such equipment.

2.12 FINISHES

- A. Factory Painting: On pumps, motors, drives, starters, control panels, and other similar self-contained or enclosed components, apply a factory protective paint system unless otherwise noted. Paint or otherwise protect surfaces that are inaccessible after assembly by a method which provides protection for the life of the equipment.
- B. Shop Priming: Except where field sandblasting is required, apply one or more shop coats of metal primer on surfaces to be finish painted at the site, of sufficient thickness to protect surfaces until finished. Primer shall be compatible with finish coat.
- C. Rust Preventive: Coat machined, polished, other ferrous surfaces, and non-ferrous surfaces which are not to be painted with rust preventive compound.

2.13 NOISE AND VIBRATION

- A. Mechanical and electrical equipment, as installed in this project, shall not create sound levels in excess of that permitted by CAL/OSHA for 8 hours per day worker exposure unless otherwise noted for the specific piece of equipment

involved. If the required sound level cannot be achieved by bare equipment in its designated environment, provide sound attenuating enclosures. Sound attenuating enclosures shall have necessary ventilation to prevent equipment overheating and shall be constructed for easy removal to permit maintenance. Devices necessary for day-to-day operation shall pierce the enclosure or otherwise be accessible without need to remove the enclosure.

- B. Equipment which when operating has obvious excessive vibrations shall be repaired or replaced as directed by the Engineer. Baseline vibration measurements shall be made where specified.

2.14 FACTORY TESTS

- A. Perform factory tests for each piece of equipment where specifically called for in the article specifying that equipment. Note that factory tests are inherent in many reference standards. The requirement for a factory test in a referenced standard is hereby made a part of these Specifications. Conduct factory tests at the same speeds and other conditions at which the equipment will operate in the field, except as noted.
- B. Where specifically noted, performance tests may be witnessed by the Engineer or his representative. Inform the Engineer in sufficient time to allow arrangements to be made for witness of such tests. When non-witnessed tests are performed, supply certified results.
- C. Tests of other equipment shall conform to the requirements set forth in these Specifications.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Inspect each item of equipment for damage, defects, completeness, and correct operation before installing.

3.02 PREPARATION

- A. Prior to installing equipment, ensure that the areas are clean. Maintain the areas in a broom-clean condition during installation operations. Clean, condition, and service equipment in accordance with the approved Instruction Manuals and specific recommendations of the equipment manufacturer.

3.03 INSTALLATION

- A. Structural Fabrications: Conform to the AISC Code and Specification referenced in Article "Structural Steel Fabrications," and conform to the Drawings.
- B. Equipment: Conform to approved Operations and Maintenance Manuals. Employ skilled craftsmen experienced in installation of the types of equipment specified.

Use specialized tools and equipment, such as precision machinist levels, dial indicators, gauges, and micrometers, as applicable. Produce acceptable installations free of vibration or other defects. Align and pin to common bedplate equipment and drivers connected by flexible couplings.

- C. Anchor Bolts: Deliver bolts with templates or setting drawings and verify that bolts are correctly located before structural concrete is placed.
- D. Base and Bedplate Grouting: Do not place grout until initial fitting and alignment of connected piping is completed. Level and align equipment on the concrete foundations, then entirely fill the space under base or bedplates with grout. Bevel exposed grout at 45-degree angle, except round exposed grout at horizontal surfaces for drainage. Trowel or point exposed grout to a smooth, dense finish and damp cure with burlap for 3 days. When grout is fully hardened, remove jacking screws and tighten nuts on anchor bolts. Check the installation for alignment and level, and perform approved corrective work as required to conform to the tolerances given in the applicable Instruction Manual.
 - 1. Make an allowance of at least 1 ½ inches for grout under the equipment bases, whether or not shown on the Drawings. Use steel shims to level and adjust the bases. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise approved, all grout shall be a favorably reviewed non-shrink, non-metallic grout.
 - 2. Grout: Dimensionally stable, inorganic, premixed and resistant to acids, alkalis, and salt water, and unaffected by water and oil. It shall have high strength even when used as a pourable mixture, and shall bond well with steel and cured concrete or be compatible with a suitable bonding agent which shall then be used to affect the bond. Use in strict accordance with the manufacturer's recommendations. Provide Five Star Grout as manufactured by U.S. Grout Corporation, Bonsal Construction Grout as manufactured by Bonsal Company, or equal. Submit for favorable review by the Engineer prior to use.
 - 3. Where practicable, place the grout through the grout holes in the equipment base and work outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge of the finished foundation.

3.04 EQUIPMENT STARTUP AND ADJUSTMENT

- A. Arrange for an authorized factory-trained representative of the company or companies supplying the various items of equipment to check the installation and adjust and test the equipment. Said representative shall be experienced and knowledgeable of the equipment being tested. Furthermore, the representative shall assist and instruct the operating staff in adjusting and operating the equipment during the initial plant operation period.

1. Provide initial lubrication for all equipment.
2. Test and demonstrate to the Engineer that all equipment operates properly, and specified performance has been attained. Furnish any test equipment or measuring devices required which are not part of the permanent installation.
3. In addition, demonstrate that the entire facility is in full operating condition prior to the acceptance of the work. Should any equipment or part thereof fail to operate as intended, immediately remove and replace it, all at the Contractor's expense. Pay for all tests involved in this Article.
4. Pressure test equipment and connections thereto as required by these Specifications.

3.05 PERFORMANCE TESTS

- A. Upon completion of the work, and after all systems are set and balanced, conduct performance tests in accordance with applicable articles of these Specifications. Submit test conditions, test data and results to the Engineer for review.

3.06 SOUND LEVEL TESTING

- A. Measure the sound level developed by all mechanical and electrical equipment provided. Perform testing as required by the technical specifications or in all rooms and spaces containing such equipment during the final operation test program with all equipment operating. Use OSHA approved instrument and record the highest sound level developed when measured according to OSHA standards in each room and space. Deliver a copy of records to the Engineer.

3.07 TOOLS, LOOSE PARTS, AND LUBRICANTS

- A. Tools and Loose Parts Supplied: Provide an inventory of tools and loose parts required to be supplied under the project. Turn over inventory and parts to the Owner. The Owner's written acknowledgment of receipt is required for project completion. Loose parts are defined as items such as special tools, keys, safety equipment, and portable equipment. Refer to relevant technical articles of these Specifications for additional instructions.
- B. Recommended Spare Parts: Furnish a complete list of recommended spare parts and supplies for each equipment furnished with current prices and a source of supply.
- C. Provide a list of all recommended lubricants not listed in the Operations and Maintenance Manuals.

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**ARTICLE 32.05
HEATING, VENTILATING AND
AIR CONDITIONING DUCT ACCESSORIES**

SECTION 32

PART 1 GENERAL

1.01 SUMMARY

A. Article Includes:

1. Furnish all labor, materials, equipment, services and incidentals required to retrofit fire and smoke damper assemblies and provide other needed duct repairs needed to shutdown air movement systems and isolate the ASC Gallery of the Pacheco Pumping Plant from air infiltration/exfiltration during a fire event. Materials and equipment to be supplied shall be new, of the best quality as specified and as shown on the Drawings.
2. Work Included in This Article:
 - a. Ductwork and accessories and duct silencers
 - b. Control dampers.
 - c. Testing, adjusting, and balancing.

B. Correction of Conflicts: When ductwork configurations, size, or location conflicts with other work (piping, electrical, structural, ceiling heights or doors) due to failure to coordinate duct layout with respective items, rework of other work and/or rework of ductwork to eliminate conflicts shall be provided as a part of the work of this Article, without additional cost.

C. Following definitions apply to terms as used in this Article:

1. Seams: Joining of two longitudinally (in direction of airflow) oriented edges of duct surface material occurring between two joints. All other duct surface connections made on perimeter are deemed to be joints.
2. Joints: Girth intersections of duct surface material; branch and subbranch intersections; tap-ins (duct collar, etc.)' fitting subsections; louver and air terminal connections to ducts; access door/panel frames and jambs; duct, plenum, and casing abutments to building structure.

D. System Performance Requirements: Duct system design, as indicated, has been used to select and size air moving and distribution equipment and other components of air systems. Changes or alterations to layout or configuration of duct systems must be specifically approved by Engineer, in writing. Accompany requests for layout modifications with calculations showing that proposed layout will provide original design results without increasing system total pressure.

E. Application and installation provisions for ductwork hangers and supports are included in Part 3 of this Article. Duct hangers and supports are not normally shown on Drawings. However, appropriate hangers and supports shall be

provided at proper intervals in compliance with provisions of this Article, with SMACNA standards and applicable code requirements.

- F. Fire and Smoke damper detection and control provisions are included in Article 36 and Article 32.13 or in this Article.
- G. Except as otherwise indicated, obtain vibration control products from single manufacturer. Engage manufacturer to provide technical supervision of installation of vibration control products.
- H. Provide Project Record Documents:
 - 1. Actual locations of ducts and duct fittings showing any additional fittings used.
 - 2. Actual location of each assembly or accessory.
 - 3. As-built HVAC drawings representing actual locations of ducts, fittings, and equipment.

1.02 REFERENCES

- A. Standards and document references in text of this Article shall be the edition current at date project manual was issued.
 - 1. American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE):
 - a. ASHRAE Handbook Equipment, CH Duct Construction
 - b. ASHRAE Handbook Fundamentals, CH Duct Design
 - 2. ASTM International (ASTM):
 - a. ASTM A36 Standard Specification for Carbon Structural Steel
 - b. ASTM A90 Standard Test Method for Weight of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
 - c. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process
 - d. ASTM A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 - e. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

3. California Energy Commission (CEC)
4. National Fire Protection Association (NFPA):
 - a. NFPA 70—National Electrical Code (NEC)
 - b. NFPA 90A—Standard for Installation of Air Conditioning and Ventilating Systems
5. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
 - a. SMACNA, HVAC Air Duct Leakage Test Manual
 - b. SMACNA, HVAC Duct Construction Standards, Metal and Flexible
 - c. Seismic Restraint Manual: Guidelines for Mechanical Systems
6. Underwriters Laboratories, Inc. (UL):
 - a. UL 181, Standard for Safety, Factory-Made Air Ducts and Connectors
7. California Building Code (CBC)
8. California Mechanical Code (CMC)

1.03 SUBMITTALS

- A. Provide shop drawings and technical literature covering all equipment and accessories being furnished under this Article. The data shall include information to demonstrate compliance with all of the requirements of these Specifications. Submittals shall include but not be limited to the following:
 1. Manufacturer's drawings detailing equipment assemblies and indicating dimensions, weights, required clearances, components, and location of field connections.
 2. Manufacturer's installation and maintenance instructions. Complete operation and maintenance (O&M) manuals shall be in accordance with the requirements of Section 14.10. It shall be the responsibility of the Contractor to correct deficiencies and provide an overall system manual.
 3. Damper data, including housing, linkages, and operators.
 4. Manufacturer's product certification, where applicable.
 5. Product data and shop drawings for each duct device and accessory to be installed on the project. In addition, submit certified performance

reports for each size and type of factory fabricated sound attenuating unit to be installed on this project, including the following:

- a. Certified test data shall include dynamic insertion loss, self-noise power levels, and aerodynamic performance. Test data shall be for a standard product having not less than 24-inch x 24-inch cross-section.
- 6. Submit product data for insulation, jackets, coverings, adhesives, sealants, cements and other materials being installed on this project. List materials and thickness for each service application.
 - a. Provide shop and installation drawings of field fabricated covers.
- B. Manuals: Furnish manufacturer's installation, lubrication and maintenance manuals, bulletins and parts lists. Furnish separate list of recommended spare parts, motor and drive replacement part numbers, service depot location and telephone number.
- C. Affidavits: Furnish affidavits from the manufacturers stating that the equipment has been properly installed and tested and each is ready for full time operation.
- D. One copy of all submittals and construction documents shall be maintained on the construction site.

1.04 QUALITY ASSURANCE

- A. Codes: Comply with all rules and regulations of authorities having jurisdiction over the work specified herein.
- B. Permits shall be in accordance with Section 4.07 of Standard Provisions of these Specifications.
- C. All equipment furnished under this Article shall: (1) be of a design and manufacturer who has been regularly engaged in the design and manufacture of the equipment for a minimum of 3 years; and (2) be demonstrated to the satisfaction of the Engineer that the quality is equal to equipment made by those manufacturers specifically named herein.
- D. The Installer shall be a company specializing in performing the work of this Article with a minimum of 3 years of documented experience.
- E. The Drawings shall be taken in a sense as diagrammatic. Size of ducts and pipes including general method of running them are shown, but it is not intended to show every offset and fitting nor every structural difficulty that may be encountered.

- F. Ductwork construction and air system performance shall be in accordance with:
 - 1. California Mechanical Code.
 - 2. ASHRAE Handbook Equipment, Chapter 1.
 - 3. ASHRAE Handbook Fundamentals, Chapter 32.
 - 4. SMACNA HVAC Duct Construction Standards, Metal, and Flexible.
- G. Provide hangers and support in accordance with SMACNA HVAC Duct Construction Standards:
 - 1. Hangers and support devices shall be designed, suitable, and appropriate for respective application, installed in compliance with product manufacturer's recommendations.
 - 2. Comply with guidelines for SMACNA seismic restraint manual requirements.
- H. Comply with applicable provisions of NFPA 90A "Standards for the installation of Air Conditioning and Ventilating Systems" for the installation of fire and smoke dampers.
 - 1. Comply with UL 555 "Standards for Fire Dampers": Dampers shall be UL listed and labeled. Smoke dampers shall also comply with UL 555S "Standard for Leakage Rated Dampers for Use in Smoke Control System."
 - 2. Manufacturer shall have tested and qualified with UL a complete range of damper sizes including all dampers covered by this specification. Testing and UL qualifying a single damper is not acceptable.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site, properly store, and protect under applicable provisions of Article 32.01.
- B. Protect motors, shafts, and bearings from weather and construction dust.
- C. Deliver sealants used for ductwork in original unopened containers, clearly labeled with product description and identification. Labeling shall include expiration date for use, pot life, curing time, and mixing instructions when applicable. Store and handle per manufacturer's instructions.

PART 2 PRODUCTS

2.01 GENERAL

- A. Similar items of equipment specified herein shall be the end product of one manufacturer.

- B. Specific information relative to the various equipment, including identification numbers, capacities, horsepower, and other information shall be as listed on the Drawings.

2.02 DUCTWORK AND ACCESSORIES

- A. Ductwork: Unless otherwise indicated ductwork shall be galvanized steel.
 - 1. Ductwork shall be of lock forming quality, ASTM A653 and ASTM A924, coating designation G90. Zinc coating in accordance with ASTM A90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.
 - a. Carbon steel sheets: ASTM A36, cold-rolled sheets, commercial quality, oiled exposed matte finish.
 - b. Reinforcements shapes and plates: Unless indicated otherwise, galvanized steel where installed on galvanized sheet metal duct. Where installed on duct of other material, shapes and plates shall be of compatible materials.
 - c. Tie rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths over 36 inches.
 - d. Other sheet metal materials: Included in this Article.
 - e. Stainless steel duct material: ASTM A480, sheet form; exposed ducts, Type 316, No. 4 finish on surfaces exposed to view; concealed ducts shall be Type 304, No. 1 finish; gage per SMACNA Standards for respective static pressure classifications.
 - f. Stainless steel duct fabrication: Fabricate ductwork in accordance with provisions of this Article, continuous external weld joints, and liquid tight. Grind seams and joint smooth where exposed.
 - 2. Rectangular duct fabrication:
 - a. General: Except as indicated otherwise, fabricate rectangular ducts of galvanized sheet steel in accordance with SMACNA "HVAC Duct Construction Standards," Tables 1-3 through 1-19, including associated details. Conform to requirements of referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.
 - b. Materials: Free from visual imperfections such as roller marks, seam marks, pitting, stains, and discolorations.

- c. Size ductwork as indicated on Drawings, coordinate with structure and other installations.
- d. Static pressure classifications: Except where indicated otherwise, construct duct systems to following pressure classifications:
 - (1) Supply ducts: 3 inches water gauge.
 - (2) Return ducts: 2 inches water gauge, negative pressure.
 - (3) Exhaust ducts: 2 inches water gauge, negative pressure.
- e. Interior ducts shall be suitably braced and stiffened at floor and roof penetrations, as well as over their unsupported length, to maintain duct integrity and to limit vibration and noise.
- f. Crossbreaking or cross beading: Crossbreak or bead duct sides as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, on following ducts, unless they are lined or externally insulated:
 - (1) 20-gauge or less duct sides, 19 inches and larger with more than 10 square feet of unbraced panel area.
- g. Low pressure ductwork joints:
 - (1) Transverse stiffeners and joints shall be appropriately spaced to maintain duct cross-section integrity in accordance with the pressure class specified and at the prevailing operating velocities.
 - (2) After joints are crimped, they shall be further secured by bottom punching or riveting. Longitudinal seams shall be Pittsburgh locked, and shall be cross-broken outward. Intake or exhaust side ducts shall be cross-broken inward. Discharge ducts shall be cross-broken outward. All plenums and casings shall be similarly cross-broken and further reinforced with 1-inch by 1-inch by 0.125-inch angles, running diagonally between joints, riveted to the casings.
 - (3) Girth joints shall be secured with "S" clips and drive cleats.
 - (a) Stiffen girth joints on ducts with any dimension larger than 15 inches to prevent bulging or sagging.

- (b) "Ductmate" connector flanges are acceptable and, when used, all duct sealing tests as required by this specification shall hold with no variation.
- h. Low pressure duct construction:
 - (1) Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees, convergence downstream shall not exceed 45 degrees.
 - (2) Ductwork fabrication:
 - (a) All ductwork shall be constructed, erected, and tested in accordance with the most restrictive of local regulations, procedures detailed in the ASHRAE Handbook of Fundamentals, or the applicable SMACNA standards. Provide duct material, gages, reinforcing, and sealing for operating pressure indicated.
 - (b) Size round ducts installed in place of rectangular ducts in accordance with ASHRAE Table of Equivalent Rectangular and Round Ducts. No variation of duct configuration or sizes permitted except by written permission.
 - (c) Joints shall be sealed, as required, to limit total system leakage to a maximum of 3-1/2% of the specified equipment airflows.
 - (d) All connections to main ducts shall be made with low loss fittings.
 - (e) Decrease in duct size shall be made by a uniformly tapering section. The change in direction of the tapering section shall not be more than 1 inch for every 5 inches of run, unless otherwise specified.
 - (f) With the exception of mitered bends, the inside radii of bends in ducts shall be equal to the duct width or diameter. Double-wall turning vanes shall be provided at all 90-degree mitered bends.
 - (g) Tee's, bends, and elbows shall be constructed with radius of not less than one times width of duct on centerline. Where not possible and where

rectangular elbows are used, turning vanes shall be provided, unless otherwise indicated on drawings.

- (h) Standard 45° lateral wye takeoffs shall be provided unless otherwise indicated where 90° conical tee connections may be used.
 - (i) Whenever ducts extend through concrete they shall be provided with a sleeve. Concrete inserts shall be provided to support all ductwork.
 - i. The Contractor shall provide all ductwork, plenums, and auxiliary work and products necessary to make the HVAC systems complete and ready for operation. Ductwork shall comply with the following restrictions and conditions:
 - (1) Snap lock seams will not be permitted.
 - (2) Visible duct deflection, loss of shape, or unwarranted noise or vibration resulting from faulty or inadequate support, reinforcing, metal gauge, fabrication, or joint spacing shall not be permitted.
 - (3) Sway bracing shall be provided, with a minimum of one at right angles to each duct run.
 - (4) Joints shall not interfere with airflow in the ducts.
 - (5) Ducts over 17 inches in largest dimension shall be cross-broken or beaded on all four sides. Sway rods, 0.375-inch diameter, shall be installed at each transverse joint in ducts over 72 inches. The spacing between rods or the rods on the side of ducts shall not exceed 48 inches.
 - (6) Supports shall be designed and installed in accordance with UBC for Seismic Zone 4 and Article 12.01.
 - 3. Rectangular duct fittings: Fabricate fittings (elbows, transitions, offsets, branch connections) and other duct construction in accordance with SMACNA "HVAC Duct Construction Standard," Figures 2-1 through 2-10.
- B. Sealing Materials:
- 1. Sealant shall be non-hardening, water resistant, fire resistant, compatible with mating material; liquid used alone or with tape, or heavy mastic, meeting the fire hazard classification rating of 25/50 when tested in accordance with ASTM E84.

2. Duct Sealer: Miracle #D-618, United McGill "UNI-WELD," United Sheet Metal "Duct-Sealer."
 3. Flanged joint mastics: One-part, acid-curing, silicone elastomeric joint sealants; ASTM C 920, Type S, Grade NS, Class 25, Use O.
- C. Duct Accessories:
1. Regulatory Requirements:
 - a. Products requiring electrical connection shall be in accordance with CCR, Title 8, and shall be listed and classified by UL as suitable for the purpose specified and indicated.
 - b. Non-metallic components shall meet the fire hazard classification rating of 25/50 when tested in accordance with ASTM E84.
 2. Openings in ductwork shall be provided where required to accommodate thermometers and controllers. Pitot tube openings shall be provided where required for testing of systems. Where openings are provided in insulated ductwork, insulating material shall be installed inside a metal ring.
 3. Ductwork and accessories shall be installed to provide a system free from buckling, warping, breathing, and vibrating. Ductwork installation shall permit installation of other required services without piercing, crimping, or reducing duct sizes. Where space conditions permit, full radius turns shall be used at offsets.
 4. To ensure airtight ducts, seams shall be sealed with liquid- or mastic-type sealants. Taped joints will not be permitted. All joints shall be in accordance with SMACNA Seal Class A.
 5. Duct sealants shall not be installed when surface and ambient temperatures are less than those recommended by sealant manufacturers. Temperatures during and after installation of duct sealants shall be maintained as recommended by the manufacturer.
 6. Duct Test Holes:
 - a. Cut or drill temporary test holes in ducts as required. Cap with threaded metal caps.
 - b. Permanent test holes shall be factory fabricated, airtight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

7. Duct access panels and doors:
 - a. Access doors shall be rigid, airtight, and fabricated in accordance with SMANA HVAC Duct Construction Standards - Metal and Flexible, as indicated.
 - b. Factory fabricated of three one-piece stampings (door frame, panel/door, and inner pan), having 1-inch fiberglass contained between panel/door and pan, which shall be welded together. Panel door shall be hung to frame with heavy loose pin hinges and equipped with cam latches, and equipped with foam rubber seals around frame attachments to duct and door to frame. Doors shall not vibrate or cause noise under service. Ventfabrics "Ventlok"; Air Balance; Advanced Air; Louvers and Dampers; Ruskin; or acceptable equivalent.
 - c. Access doors shall be rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices as follows:
 - (1) Less than 12 inches square: Sash locks.
 - (2) 12 to 18 inches square: Two hinges and two sash locks.
 - (3) Access doors with sheet metal screw fasteners are not acceptable.
 - d. Panel/door size: Not less than 18 inches in length along run of duct and a minimum of 75% of duct width across duct, up to 24-inch x 18-inch maximum size door, regardless of duct dimensions.
 - e. Access panel/doors for round and flat oval ducts: Insulated; United Sheet Metal Company Type "AR-W"; or acceptable equivalent.
8. Flexible duct connections:
 - a. Flexible connection material: Fire-retardant, waterproof, airtight, abrasion proof, ozone-resistant, neoprene coated woven glass fabric that is not affected by temperature as low as -10°F or as high as 200°F and manufactured for pressures involved. The coating shall not weigh less than 24 ounces per square yard.
 - b. Flexible duct connections shall be Ventfabrics, Inc. "Ventglas"; Duro- Dyne Corporation "Neoprene"; or equal.
 - c. Fabric shall conform to the requirements of NFPA 90A, maximum flame spread rating of 25, smoke developed rating of 50 for all materials, including connecting tape and sealant when tested in

accordance with the requirements of ASTM E84. Minimum density shall be 30 ounces per square yard.

- d. Flexible connectors shall be UL-listed.
- e. Flexible connectors shall be provided with the necessary angle, straps, bolts, clips, or other fasteners to secure the flexible material to the equipment and ducts.
- f. Flexible connections shall be designed to be removed and reinstalled without disassembling adjacent ductwork.
- g. Flexible duct connectors shall be fabricated in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible, and as indicated on the Drawings.

2.03 FIRE/SMOKE DAMPERS

- A. Fire Dampers shall be Pacific Air Products Company model FD-100-14-H, Terry; or equal, approved and listed by Underwriters Laboratories Inc. and bearing the UL label (1½-hour rating) with fusible link set for 165°F.
- B. Combination Fire and Smoke Damper:
 - 1. The fire and smoke dampers shall be 1½-hour, UL labeled in accordance with UL Standards 555 and 555S, and approved for use where ducts penetrate partitions with fire resistance ratings of two hours. The fire and smoke dampers shall meet all NFPA requirements for smoke dampers and shall be Ruskin Model FD-35, FSD-36 fire/smoke damper; Greenheck Model FSD-22; Safe Air Inc. Smoke/Shield Model 700; or equal.
 - 2. The fire and smoke dampers shall be furnished complete with factory furnished sleeves of the correct length and gauge to comply with the applicable building codes.
 - 3. UL classified as a leakage rated damper for use in smoke control systems under UL 555S, Class I (4 cfm ft² at 1-inch w.g. static pressure), unless indicated otherwise on Drawings. Incorporate following, or acceptable equivalent materials and features:
 - a. Frame: 16-gauge minimum galvanized steel formed into a structural channel shape with reinforced corners.
 - b. Blades: 16-gauge minimum galvanized steel with longitudinal ribs for reinforcement.
 - c. Bearing: Stainless steel sleeve in extruded hole in frame.

- d. Blade and jamb seals: Approved for required leakage class at specified temperature classification.
- 4. Damper operation: Capable of interfacing electrically with smoke detectors, building fire alarm systems, and remote indicating/control stations, coordinated with respective control method. Provide following incorporated in or furnished with each damper:
 - a. Damper actuator: Appropriate type supplied with damper, installed by damper manufacturer and furnished as a single entity that meets all applicable UL 555 and UL 555S qualifications for both dampers and actuators. Damper/actuator assembly shall be factory cycled 10 times to assure operation.
 - b. Blade lock device: UL classified, arranged to electrically and mechanically lock damper in closed position when duct temperatures exceed 165°F and still allow appropriate authority to override device and operate damper as may be required for smoke control functions. Damper must be operable while temperature is within device temperature category, 250°F minimum unless indicated otherwise on Drawings.
 - c. Damper position indicator switches: Two, linked directly to damper blades, shall provide capability of remotely indicating damper position. One switch shall close when damper is fully open; another switch shall close when damper is fully closed.
 - d. Control device fire protection feature: Return damper to fire protection mode when temperature reaches operational limit of damper/actuator assembly, to comply with NFPA 92A requirements.
- 5. Operator and controls will provide the following functions:
 - a. Fail-safe closure on signal from smoke sensors or fire alarm control panel.
 - b. Fail-safe closure on power failure (after a 20-second delay to eliminate momentary power loss closure).
 - c. Automatic reset of dampers from central control panel after resolution of emergency condition. DAMPERS MUST NOT OPEN AUTOMATICALLY ON RESTORATION OF POWER.
 - d. External manual control override or reset from outside the duct with or without the availability of electrical power.

- e. The damper shall provide all the automatic closing functions of a basic fire damper with a fusible actuator overriding all control functions at 165°F.

PART 3 EXECUTION

3.01 GENERAL

- A. Examination, Coordination and Incorporation of Related Work:
 - 1. Examine areas and conditions, with installer present, for compliance with requirements for installation tolerances, roof curbs, existing roof openings, equipment supports, ductwork, and other conditions affecting performance of fans.
 - 2. Contractor shall notify Engineer of deficiencies that impact his ability to complete his work. The deficiencies will be corrected as directed by the Engineer.
 - 3. Automatic dampers: fire and smoke dampers are specified in this Article. Ductwork trades shall see that dampers are properly selected, shall notify supplier when dampers will be required on project, and install those dampers.
 - 4. Before installing insulation, verify that respective work to be insulated is complete, has been tested and cleaned, and is ready to be insulated.
 - 5. Contractor shall obtain wall and ceiling construction information from General Construction Drawings and Specifications and coordinate diffusers, register and grille mounting arrangement and accessories with respect to adjacent construction.
- B. Protection: Fully protect all surfaces exposed to the air stream and all unfinished parts of the materials and equipment against damage from whatever cause during the progress of the work and until final completion. All materials and equipment shall be covered while in storage and during construction in such manner that no finished surfaces shall be damaged or marred and all moving parts shall be kept perfectly clean and dry.
 - 1. When installing insulation, use tarpaulins or other coverings to protect equipment, uncovered piping and ductwork from dirt and rubbish that may be caused by insulation installation operations.
 - 2. Prior to starting insulation installation operations and while performing work, verify that environmental conditions are within manufacturer's recommendations for sealants, tapes, and other adhesives to be used.

3.02 DUCTWORK INSTALLATION

- A. All sheet metal ductwork shall be erected in a first class and workmanlike manner and shall be in accordance with the applicable sections of CBC, CMC, and CEC, and in accordance with "Low Pressure Duct Standards" of the Sheet Metal and Air Conditioning Contractors National Association, Inc., and as specified above. No ductwork shall be fabricated or installed until it has been carefully coordinated with other trades. Ducts shall be located with sufficient space around equipment to allow normal operations and manufacturing activities. All transverse duct joints shall be taped airtight. Duct dimensions shown are "net" inside clear. Each air supply outlet and each air return or outside air intake shall have either an integral volume control device or shall be furnished with a volume damper.

1. Duct installation, general:
 - a. Duct system pressure class: Construct and install each duct system for the specific duct pressure classification indicated.
 - b. Install ducts with fewest possible joints.
 - c. Secure joints with sheet metal screws.
 - d. Seal all joints and seams. Apply sealer to male end connectors before insertion, and afterwards to cover entire joint and sheet metal screws.
 - e. Flanged joints: Seal with neoprene rubber gaskets.
 - f. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.
 - g. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.
 - h. Install ductwork generally in the location and manner shown and detailed on Drawings, with all fittings and connections made in accordance with applicable SMACNA Standards. Modifications or deviations required by job conditions must be approved by the Engineer prior to fabrication.
 - i. Provide and install duct accessories (dampers, turning vanes, and access doors) where called for and where shown on Drawings and where required.
 - (1) Openings in ductwork shall be provided where required to accommodate thermometers and controllers. Pitot tube openings shall be provided where required for testing of systems, complete with metal can with spring device or

- ensure against air leakage. Where openings are provided in insulated ductwork, insulating material shall be installed inside a metal ring.
- (2) Ductwork and accessories shall be installed to provide a system free from buckling, warping, breathing, and vibration. Ductwork installation shall permit installation of other required services without piercing, crimping, or reducing duct sizes. Where space conditions permit, full radius turns shall be used at offsets.
 - (3) To ensure airtight ducts, seams shall be sealed with liquid- or mastic-type sealants. Taped joints will not be permitted. All joints shall be in accordance with SMACNA Seal Class A.
 - (4) Duct sealants shall not be installed when surface and ambient temperatures are less than those recommended by sealant manufacturers. Temperatures during and after installation of duct sealants shall be maintained as recommended by the manufacturer.
 - (5) No power actuated anchors shall be used.
 - (6) Duct Test Holes:
 - (a) Cut or drill temporary test holes in ducts as required. Cap with threaded metal caps.
 - (b) Permanent test holes shall be factory fabricated, airtight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.
- j. Provide 1-inch minimum clearance between structure components, furring, and outside of duct insulation and outside of uninsulated duct.
- k. Provide sleeves for ductwork passing through walls, roofs, ceilings or floors, and seal against water, air and smoke penetration.
- (1) Sleeves: Steel, 10-gauge minimum.
 - (2) Sleeves for externally insulated ductwork: Of sufficient size to permit insulation to continue through sleeve unbroken.
 - (3) Sleeve flanges shall not be less than 4 inches wide, and shall be installed tight against each side of the barrier. Sleeves shall be 2 inches larger than the duct or external

duct insulation. The space between the duct or insulation and the sleeve shall be packed with fiberglass or the material of the original wall. Duct flanges exceeding 4 inches wide shall be installed tight against the wall on each side and shall be fastened to the duct sleeves.

- (4) Sealing material for duct sleeves: Foamed in place fire-resistant silicone foam sealant that remains pliable after application and curing. Comply with ASTM 119-73, UL classified as a wall opening protective device. Foam shall be Dow Corning silicone RTV foam; General Electric Company silicone foam Pensil 851; Chase Foam CTC PR 855; or Pyro-Pac by Thunderline Corporation.
 - (5) Coordinate wall and floor penetrations with firestopping requirements specified in Article 07840.
- l. Penetration flanges: Where ducts exposed to view pass through non- fire-rated interior partitions and exterior walls, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gauge as duct. Overlap opening on all sides by at least 1½ inches.
- m. Provide flexible connections between sheet metal assemblies such as ductwork and plenums, and operating machines and/or mechanisms such as fans and air handlers.
 - (1) Flexible connections not less than 8 inches long (net) between connected Articles of ductwork shall be held in place by 1-inch by 1/8-inch band iron bolted in place around entire perimeter of connecting ductwork.
- n. Joint sealing during fabrication and assembly:
 - (1) Thoroughly seal all air ducts and taps against air leakage and all exterior and outside air ducts against moisture leakage. Paint or trowel sealer on joints before assembly.
 - (2) Thoroughly streamline all fittings in rectangular ducts around joints by applying a filler to cover all edges extending in to the air stream.
 - (a) Set damper frames in a sealer with frame filleted into ductwork with a filler compound.
 - (3) Butted flanged joints in ductwork shall be wiped smooth with a filler compound.

- (4) Seal heating and cooling coils, headers, manifolds or return bends external of forced air (whether serpentine type or otherwise) with field applied duct sealer.
- (5) Seal terminal box joints with field applied duct sealer.
- (6) Flanged Joints: Seal with neoprene rubber gaskets.
- (7) Seal variable air volume terminal unit joints with field applied duct sealer.
- o. Adjusting and cleaning: Vacuum duct systems prior to final acceptance to remove dust and debris. Duct systems shall be cleaned with high power vacuum machines. Equipment that may be harmed by excessive dirt shall be protected with filters, or bypassed during cleaning. Adequate access into ductwork shall be provided for cleaning purposes.
- p. The inside of all ducts visible through grilles and registers shall be painted flat black.

3.03 DUCT ACCESSORIES

- A. General: Provide and install duct accessories where called for, where shown Drawings, and where required according to manufacturer's installation instructions, applicable portions of details of construction in SMACNA Standards, and applicable provisions of ductwork sections and drawings.
- B. Application and Installation of Duct Access Panels and Doors:
 - 1. Provide access panels/doors in ducts in the following locations:
 - a. Where shown or required for inspection and cleaning.
 - b. On reset side of fire dampers.
 - c. On both sides of duct mounted coils.
 - d. Adjacent to duct mounted automatic dampers.
 - e. At each volume damper if the damper is concealed or inaccessible.
 - 2. Installations involving other than four-sided duct: Provide necessary transition collars and fittings to correctly install proper size access panels/doors.

3. Access panels/doors for service of fire dampers: Stencil words "FIRE DAMPER" in $\frac{3}{4}$ -inch minimum height on outside of door.
- C. Application and Installation of Flexible Connections for Ductwork:
 1. Flexible connections in ducts shall be installed in folds, and of sufficient length to accommodate the maximum deflection resulting from vibration and contraction without causing strain.
 2. Minimum length in folded position shall be 6 inches. Allow for at least 1-inch of slack.
 3. Provide flexible connections between sheet metal assemblies and equipment, and between different sheet metal assemblies, as called for in respective specifications and as shown on respective Drawings.
 4. Installation: Governed by respective application specifications and details.

3.04 FIRE AND SMOKE DAMPERS

- A. Application and Installation of Fire and Smoke Dampers:
 1. Provide type dampers installed in locations as prescribed by NFPA and where shown on Drawings.
 2. Install dampers in accordance with damper manufacturer's UL-approved printed instructions, utilizing steel sleeves, angles, other materials, and practices required to provide an installation equivalent to that used in UL tests. Sleeves may be factory installed or field-installed, in compliance with UL provisions.
 3. Provide service openings in ductwork, adjacent to each damper, sized and arranged to permit maintenance and resetting of damper, equipped with duct access door or panel. Provide specified access panels (doors) (15055) in ceilings and walls, as required of access to each damper.
 4. Acceptance testing: Perform acceptance test in accordance with provisions of NFP 90A.
 5. Demonstrate to Engineer, Owner's Representative, and Insurance Carrier Representative that dampers are properly installed and will operate satisfactorily.
- B. Interface and Operation of Fire/Smoke (Smoke) Dampers:
 1. Coordinate interface of each fire/smoke (smoke) damper with smoke detection/control devices and systems. Refer to Drawings, Article 32.13 and this Article.

2. Arrange each damper and interfaced device to function as described under Damper Operation in fire/smoke damper specification of this Article and further described in temperature control and fire alarm specification Article 32.13 and on the Drawings.

3.05 FIELD QUALITY CONTROL

A. Test and Adjustment of Dampers:

1. Following installation, single-blade dampers and splitter dampers shall be tested to ensure operation through their full range of movement, without binding or interference.
2. Prior to installation and following installation, multiple-blade dampers shall be manually tested to ensure operation through their full range of movement, without binding or interference.

3.06 DEMONSTRATION

- A. Demonstrate equipment operation to Owner's operating and maintenance personnel. Instruct personnel in procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance, and how to obtain replacement parts.
- B. Familiarize personnel with contents of Operating and Maintenance Manuals.
- C. Schedule demonstration and instruction with at least 7 days advance notice.

ARTICLE 32.13 FIRE ALARM CONTROL SYSTEM

SECTION 32

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Applicable provisions of Santa Clara Valley Water District (SCVWD) Technical Specifications become a part of this Section as if repeated herein.
2. This performance specification provides the minimum requirements for the Life Safety System. The work provided shall include, but not limited to furnishing all permits, equipment, materials, delivery, labor, documentation, testing and services necessary to design and furnish and install a complete, operational system Fire Alarm System.
3. At the time of bid, all exceptions taken to these Specifications, all variances from these Specification and all substitutions of operating capabilities or equipment called for in these Specification shall be listed in writing and forwarded to the Designer. Any such exception, variances or substitutions that were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment.
4. Contractor shall be responsible for the replacement of the existing Fire Alarm System and verifying existing fire alarm devices to remain are functional and connected back to the new fire alarm system for a complete working system.
5. The Contractor shall prepare the appropriate fire alarm system design and shall submit all the required drawings, equipment specifications, riser diagrams, worst case voltage drop calculations, battery calculations, mounting details, and equipment to SCVWD and local Fire Department for review and obtain a deferred approval.
6. The Contractor shall be responsible to repair or replace damaged electrical conduit or wiring and shall maintain cleanliness in the fire control room during any given project.

1.02 REFERENCE STANDARDS

A. American National Standards Institute (ANSI) Publication:

1. C2 National Electrical Safety Code

- B. National Fire Protection Association (NFPA) Publications:
 - 1. 20 Fire Pumps
 - 2. 70 National Electrical Code
 - 3. 71 Signaling Systems for Central Station Service
 - 4. 72 National Fire Alarm Code, as amended by CA code
 - 5. 2001 Clean Agent Fire Extinguishing Systems
- C. Underwriters Laboratories (UL)
- D. California State Fire Marshal Listed Components
- E. Bureau of Reclamations:
 - 1. 3-32 Transformer Fire Protection
 - 2. 5-2 Firefighting and Fire Prevention
 - 3. 5-12 CO2 Systems
- F. Merced County Fire Marshal

1.03 CONTRACTOR QUALIFICATIONS

- A. All work in this Section shall be performed (furnished, installed and connected) by a qualified fire alarm Contractor (California C-10 License). The fire alarm Contractor shall provide the following documentation to show compliance with the Contractor qualifications within 14 days after notice of award of Contractor.
 - 1. Contractor's License: A copy of the Contractor's valid State of California License. The Contractor shall be licensed in the state of project location and have been incorporated in the business in that state for a minimum of 5 years.
 - 2. Proof of Experience: Proof that the fire alarm Contractor has successfully installed similar system fire detection, evacuation voice and visual signaling control components on a previous project of comparable size and complexity.
 - 3. Insurance Certificates: Copy of fire alarm Contractor's current liability insurance and state industrial insurance certificates in conformance with the contract document.
 - 4. The Contractor shall be a Honeywell Authorized Partner or Contractor that has installed Silent Knight FACP, Very Early Smoke Detection Apparatus (VESDA) detection equipment, and clean agent suppression equipment. Proof of authorization shall be required.

1.04 SCOPE OF WORK

- A. Replacement of the existing Fire Alarm Panel and associated initiating and notification devices. The existing Fire Alarm Panel is connected to a central station and the central station notifies the SCVWD staff and Cal Fire of any alarms. The pumping station is normally unmanned and the response time from the nearest fire station is approximately 30-45 minutes. Existing initiating devices include manual pull stations, smoke detectors, and duct detectors. Duct detectors currently are not connected to the existing FACP but are connected to SCADA. SCADA system shall be modified to reflect duct detectors connected to the new FACP. Existing notification devices are horn/strobes.
- B. All new fire alarm equipment and devices shall be a product of Honeywell.
- C. The Contractor shall obtain and pay for all permits and related fees including any fees for after-hours testing and expedited plan check.
- D. The Contractor will be responsible for providing all required professional Engineering stamps/certification and all required Contractor's license requirements, which are required by the Authority Having Jurisdiction (AHJ).
- E. The Contractor shall coordinate and work with SCVWD for an optimal allowable fire alarm system shut-down period. Provide an interim fire alarm system while installing the new system. The existing fire alarm system has a limited coverage so the need for a fire watch should be minimal.
- F. The Contractor shall guarantee for a period of one year upon completion and final acceptance by SCVWD that the fire alarm system functions appropriately and all addressable devices do not "hang-up" or stay on a tripped state after the fire alarm has been reset.
- G. The fire alarm scope of work shall consist of the following minimum requirements.
 - 1. A clean agent fire suppression system shall be installed in the Adjustable Speed Control Gallery, ASC Gallery covered in Article 32.15 and shall be connected to the new Fire Alarm Control Panel, FACP.
 - 2. Fire Alarm Control Panel shall have the following features:
 - a. VESDA type smoke detection system VESDA smoke detection s shall activate horn strobes throughout the building, send a distinct signal to the central station and the remote District center, and show a distinct signal on the building panel.
 - b. Addressable smoke detectors in the ASC Gallery. The first activated smoke detector in the ASC Gallery shall activate horn strobes throughout the building and send a distinct alarm signal to central station, district, and show a distinct signal on the FACP. Activation of any additional smoke detectors would shut down the

HVAC, close dampers to prevent agent from escaping, start a time delay, discharge the clean agent, send alarm signal to central station, the District, and show a signal on the FACP.

- c. Addressable Manual Pull Stations in the ASC Gallery. In the event a manual pull station is activated, horn strobes are activated throughout the building, shut down the HVAC, close dampers to prevent agent from escaping, start a time delay, discharge the clean agent, send alarm signal to central station, the District, and show a signal on the FACP.
- d. Addressable heat detectors at hydraulic oil system. Activated heat detectors shall activate horn strobes are activated throughout the building, send alarm signal to central station, the District, and show a signal on the FACP.
- e. Addressable smoke detectors above electrical panels in the Pump Gallery. Activated smoke detectors shall activate horn strobes are activated throughout the building, send alarm signal to central station, the District, and show a signal on the FACP.
- f. Addressable manual pull stations in the remaining Pump Building (excludes ASC Gallery). Activated manual pull stations shall activate horn strobes are activated throughout the building, send alarm signal to central station, the District, and show a signal on the FACP.
- g. Addressable duct detectors. Activated duct detectors shall activate horn strobes are activated throughout the building, send alarm signal to central station, the District, and show a signal on the FACP.
- h. Addressable fire sprinkler system flow switch. Activated flow switch shall send alarm signal to central station, the District, and show a signal on the FACP.
- i. Addressable horn/strobes throughout the building and exterior.
- j. Contacts to connect the existing duct smoke detectors
- k. The FACP shall monitoring the following additional status signals and send signals to central station, the district, and display on the FACP:
 - (1) Fire Pump:
 - (a) Running
 - (b) Loss of Phase
 - (c) Phase reversal

- (2) Tamper switches
 - (3) Flow switch
- I. FACP shall be Honeywell Silent Knight or approved equal from Honeywell:
 - (1) Power: 120VAC
 - (2) 24-hour battery-backup.
- m. Communication to Central Station and District shall be through existing phone lines.

1.05 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Review category of the General Conditions and the submittal requirements of SCVWD submittal specifications.
- B. Shop Drawings: Shop drawings shall include interconnection diagrams, elementary diagrams, riser diagrams, and complete descriptions of components and zones. Interconnection diagram shall be of sufficient detail to verify suitability of the fire alarm control system shown on the Drawings. Shop drawings shall include battery calculations supporting a minimum 24-hour standby plus 5 minutes in alarm. Interconnection diagram shall be of sufficient detail to verify suitability of the fire alarm control system shown on the Drawings. It shall also allow coordination for fire alarm control system conduit and wiring inside structures, which is not shown on the Drawings.
 - 1. CSFM listing sheet for each component.
 - 2. Bill of Materials with part numbers, device mounting height, peripheral device backbox size.
 - 3. Detailed system operational description.
 - 4. Riser Diagram that individually depicts control panels, annunciators, addressable devices and notification appliances. Field addressable devices and notification appliances may be grouped together by specific type per loop or circuit if allowed by AHJ. All addressable devices, initiating and relay, must have the identifying addresses in all drawings. All annunciators and control panels must be clearly identified and accurately located in all drawings.
 - 5. Complete scaled floor plan drawings locating all system devices and elevation of all equipment. Floor plans shall indicate accurate locations for all control and peripheral devices as well as raceway size and routing, junction boxes, and conductor size, and quantity in each raceway. All notification appliances shall be provided with a candela rating and circuit

address that corresponds to that depicted on the Riser Diagram. End-of-line resistors (and values) shall be depicted.

6. Control panel wiring and interconnection schematics. The drawing(s) shall depict internal component placement and all internal and field termination points. Drawing shall provide a detail indicating where conduit penetrations shall be made, so as to avoid conflicts with internally mounted batteries. For each additional data-gathering panel, a separate control panel drawing shall be provided, which clearly indicated the designation, service and location of the control enclosure.
 7. Complete calculations shall clearly indicate the quantity of devices, the device part numbers, the supervisory current draw, the alarm current draw, totals for all categories, and the calculated battery requirements. Battery calculations shall also reflect all control panel component, remote annunciator, and auxiliary relay current draws.
- C. As-Built Diagrams and Manuals: Upon completion of work and prior to final testing and inspection, furnish as-built drawings showing the exact sequence of all initiating devices as they were installed in the circuits.
- D. Operational and Maintenance Manuals: Furnish operation and maintenance manuals as required under SCVWD Specifications. Provide:
1. Statement of Guarantee including date of termination and name and phone number of service personnel to be called in the event of equipment failure.
 2. Individual factory issued manuals containing all technical information on each piece of equipment installed.
- E. Regarding the seismic anchorage requirements:
1. Submit in accordance with SCVWD Specifications.
 2. Shop Drawings: Submit signed and sealed structural calculations and detailed drawings for the attachments and anchorage to the structure of the equipment and appurtenances in this section: Calculations shall conform to the design criteria and requirements noted on the structural drawings.
 3. Submit certification from the manufacturer that the equipment is capable of resisting seismic loads. Loading shall be as described on the structural drawings.

PART 2 PRODUCTS**2.01 GENERAL**

- A. All equipment and components shall be the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approval agency for use as part of a protected premises (fire alarm) system.
- B. All equipment shall be listed by the State Fire Marshal, UL listed, FM listed, and tested by a nationally recognized fire test laboratory.
- C. The Contractor shall provide, from the acceptable manufacturer's current product lines, equipment and components, which comply, with the requirements of these specifications. Equipment or components, which do not provide the performance and features, required by these specifications are not acceptable, regardless of manufacturer.

2.02 SYSTEM OPERATION

- A. General Alarm Operation: Upon alarm activation of any area smoke detector, duct smoke detector, heat detector, manual pull station, sprinkler waterflow, VESDA Detector, the following functions shall automatically occur:
 - 1. The FACP shall include a full featured operator interface control and annunciation panel that shall include a backlit, 80-character liquid crystal display, individual, color coded system status LED's, and an alphanumeric keypad for the field programming and control of the fire alarm system. The readout shall indicate the device in alarm, device location and time/date.
 - 2. Alarm tones shall sound throughout the facility. The system shall have the capability to generate multiple distinct alarm tones as determined by event initiated programs.
 - 3. All horn/speaker/flasher alarms shall sound continuously until reset at main panel.
 - 4. De-energize air handling units serving the area in alarm. Also, de-energize supply fans serving the area in alarm.
 - 5. Release smoke dampers.
 - 6. FACP shall communicate with the ASC Gallery Fire Suppression Control Panel (FSCP) and the existing water-based fire suppression system.
 - a. Activation of the first smoke detector in the ASC Gallery shall actuate audible and visual alarm signals throughout the PPP facility which is communicated to both FACP and FSCP.

- (1) Initiates a 'warning' alarm providing time for site personnel to evacuate the ASC Gallery and time to interrupt the sequencing of the clean agent discharge system.
 - (2) If site personnel 'aborts' the clean agent discharge system via the Abort Switch, then separate horn/strobe units with different color and tone shall be actuated throughout the pump station.
 - (a) If the clean agent discharge system starts to discharge the 'Abort' switches shall cease system operation.
 - (b) A manual release switch shall provide an override of the 'Abort' switch.
 - b. Activation of the second smoke detector shall initiate the clean agent fire suppression system. The FSCP shall:
 - (1) Close the dampers and shutdown HVAC units supplying air to the ASC Gallery.
 - (2) Close the fire dampers between the ASC Gallery and the adjoining Pump Gallery.
 - (3) Shut down the rooftop exhaust fans for the ASC Gallery.
 - (4) Discharge the clean agent after a time delay period.
 - (5) Send secondary alarm signal to the Main FACP and to the Central Station monitoring location and to the District Operations.
 - c. Activation of the manual pull stations shall initiate the alarm notification system and the clean agent discharge sequence without the time delay period of the pre-discharge 'warning' notification.
 - d. 'Supervisory', 'Alarm', and 'Trouble' signals shall be relayed between FSCP and FACP for communication to both the Central Station and the District's Operations.
7. FACP shall communicate with the existing water-based fire suppression system.
- a. Addressable relays on the flow switch at the existing fire pump discharge shall initiate an alarm.

- b. Addressable relays on the tamper switches at the existing fire pump discharge valve and supply valve piping shall initiate an alarm when activated.
 - c. Voltage monitoring relay shall be added to the fire pump controller for run station, loss of phase, and phase reversal. The relays shall communicate to FACP, fire pump running, fire pump loss of phase, and fire pump phase reversal signals.
8. Transmit alarm warning to Central Station and the district via telephone line.

2.03 COMPONENTS

- A. Addressable Detector Bases: All addressable smoke and heat detector heads shall be suitable for insertion into twist lock bases. The base shall contain electronics that communicate the detector status (normal, alarm, trouble) to the control panel via an electric circuit. The same circuit shall also provide power to the base and detector. Different detector heads (smoke or heat) shall be interchangeable. Upon removal of the head, a trouble signal shall be transmitted to the control panel. Provide Silent Knight B210LP; or equal.
- B. Addressable Photoelectric Detector: The Photoelectric type detector shall be a plug-in unit, which mounts to a base. The detectors shall be of the solid-state photoelectric type and shall contain no radioactive material. They shall use a pulsed infrared LED light source and be sealed against rear air flow entry. Provide Silent Knight SK-PHOTO; or equal. The detector shall fit into a base that is common with both the heat detector and ionization type detector and shall be compatible with other addressable detectors.
- C. Addressable Thermal Detector: Provide a combination rate-of-rise and fixed temperature (135°F) type, automatically restorable. The detector shall fit into a base that is common with both the photoelectric and ionization type detectors and shall be compatible with other addressable detectors. The thermal detectors shall be shock and corrosion resistant. Provide Silent Knight SK-HEAT; or equal.
- D. Addressable Manual Pull Stations:
 - 1. Addressable manual pull stations shall contain electronics that communicate the station's status (alarm, normal) to a control panel which also provides power to the pull station. The address shall be set on the station. They shall be manufactured from high impact red Polycarbonate. Pull stations shall be single action. Provide Silent Knight SK-PULL-DA; or equal.
 - 2. The front of the station shall be hinged to a backplate assembly and must be opened with a key or Allen head screw to reset the station.

3. The addressable manual pull station shall be capable of field programming of its "address" location on an addressable initiating circuit. The manual station shall be fitted with screw terminals for field wire attachment.
- E. Addressable Duct Detector:
1. The detector shall be a non-polarized 24-VDC type that is compatible with the Control Panel and obtain its operating power from the supervisory current in the fire alarm detection loop.
 2. Detectors shall be of the solid-state photoelectric type and shall operate on the light scattering, photodiode principle. To minimize nuisance alarms, detectors shall have an insect screen and be designed to ignore invisible airborne particles or smoke densities that are below the factory set alarm point. Manufacturer shall be Silent Knight/Honeywell with appropriate addressable detector; or equal.
 3. Auxiliary SPDT relays and/or remote LED alarm indicators and key operated test stations shall be installed where indicated.
- F. Addressable Vesda Detector:
1. VESDA laser plus detector shall sample air along a ¾-inch pipe and shall be provided per plans and scope of work.
 2. VESDA detectors shall be Honeywell Xtrais VEU-A10 and the associated monitoring modules.
- G. Interface Modules:
1. General: Interface modules shall be used for monitoring of flow switches, tamper switches, and non-addressable detectors. They shall also be used for control of dampers, door latches, fire windows, elevator controls, HVAC system and for signaling horns and lights. An addressable interface module shall be provided for interfacing direct contact devices to an addressable initiating circuit. Provide interface modules suitable for mounting in a terminal box. Interface modules shall receive power from a separate circuit running from an appropriate power supply or be loop powered directly from the fire alarm system.
 - a. Interface modules shall be supervised and uniquely identified by the control panel. Device identification shall be transmitted to the control panel for processing according to the program instructions. Should the interface module become non-operational, tampered with, or removed, a discrete trouble signal, unique to the device, shall be transmitted to, and annunciated at, the control panel.

- b. The interface module shall be capable of being programmed for its "address" location on the addressable device initiating circuit. The interface module shall be compatible with addressable manual stations and addressable detectors on the same addressable initiating circuit.
 - c. Provide two types of devices:
 - (1) Type 1: Monitor, Input
 - (2) Type 2: Control, Output
 - 2. For Type 1:
 - a. Provide addressable interface module for supplying power to and monitoring the status of a zone consisting of conventional 2-wire detectors or normally open contact devices as specified elsewhere. The supervision of the zone wiring shall be Class B. The Interface module shall communicate the zone's status (normal, alarm, trouble) to the control panel.
 - b. Provide addressable interface module for supplying power to and monitoring the contact status of a zone consisting of conventional 4-wire smoke detectors as specified elsewhere and identified in the schedule. The interface module shall provide detector reset capability and a fuse to provide over-current power protection for the 4-wire detector. The interface module shall communicate the zone's status (normal, alarm, trouble) to the control panel.
 - 3. For Type 2:
 - a. Provide a fused, addressable interface module for double pole double throw relay switching that can be used to connect: a zone of signals to a power source; speakers to an audio source; horns; or activate a variety of controlled devices. The module shall be Class B supervision type. Class B devices shall be provided as identified in the schedule on the Drawings. The inter-face modules shall communicate the supervised wiring status (normal, trouble) to the control panel and shall receive a command to transfer the relay from the fire alarm control panel.
- H. Addressable Device Supervision:
 - 1. All devices shall be supervised for trouble conditions. The system control panel shall be capable of displaying the type of trouble condition (open, short, device missing/failed).
 - 2. Should a device fail, it shall not hinder the operation of other system devices.

- I. Sprinkler system flow switches and post indicating valve switches shall be provided under other sections. All interconnecting conduit and wire shall be provided under this Specification Section except as described below.
- J. Microprocessor Based Control Panel: Control panel shall be field configurable, programmable and editable. The control panel shall be equipped for total system control including continuous supervision and verification of detector operation. All devices and their location shall be identified by a system of addresses. The control panel shall be able to adjust detector sensitivity and check calibration from a preset value. The control panel shall include all interface modules for control, signal and monitoring of all devices in the fire alarm system. The control panel shall include built-in self-check, multiple system and automatic operation with manual override. Provide Nickel-cadmium batteries and battery charger system capable of 24 hours of backup power. Manufacturer shall be Silent Knight 6820.
- K. Conduit and Wire: No fire alarm control system wiring is shown on the Drawings. All fire alarm interconnecting conduit and wire shall be coordinated and provided under this Section. Should the fire alarm system require additional conduits not shown on Drawings, Contractor shall provide them as part of the system at no additional cost to the Owner. Provide all conductors as required for a fully operational system. Power conductors shall be 12 AWG minimum. Control conductors shall be 16 AWG minimum. Signal conductors shall be 18 AWG minimum signal cable with shield. All conductors shall be suitable for installation underground in conduit or cable tray. Provide grounding and ground wires as necessary; conduit shall not be used for ground return. All conductors shall conform to Specification Sections 26 05 19 and 26 05 36. All conductors shall be labeled to represent the function in the circuit. Each fire alarm circuit wire termination shall be made with a solderless tool crimped ring terminal.
- L. Horn/Strobe Audio-Visual Signaling Device: Unit shall have a red surface mounting enclosure containing a horn and a xenon flash tube operating on 24 Vdc. Sound level shall be 90 to 94 decibels at 10 feet distance. Strobe shall be enclosed in a white translucent lens having the words "FIRE" imprinted on three sides. Strobe flash rate shall be 1 to 1.5 times per second. Unit shall have a surface mounting red enclosure. Device shall be with LED (designed for industrial purposes for indoor and outdoor) Silent Knight; Fire-Lite; or equal.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Installation shall not begin until the State Fire Marshal Listing for all equipment and plans and specifications have been approved by the Fire Marshal's office in Merced County and the State of California Fire Marshal's Office.
- B. Installation of wiring and equipment shall conform to Article 760 of NFPA 70 and Article 210 of NFPA Standard No. 72.

- C. Earthquake resistant installation/fastening of equipment shall be required.
- D. All wiring shall be in conduit. Terminations in control panels shall be made on terminal strips with a separate point for each conductor.
- E. Mount all ends of line resistor boxes where they will be readily accessible at all times and at 54 inches above the finished floor.
- F. Install no automatic detection equipment on its ceiling mounting plate until the associated room has been painted and cleaned. A minimum of 2% or two (whichever is larger) automatic detection elements shall be given to the Owner as spares.
- G. After completion of the installation and after all environmental systems are in normal operation, the equipment supplier shall supply the services of a factory-trained technician to test and calibrate the system.
- H. After completion of check-out, a certified letter shall be provided to the Engineer indicating that fire alarm system is complete and operable.
- I. System check-out to include check of all flow switches by activating paddles to simulate water movement and activating the preaction panels to simulate an activated detector.
- J. During test, in conjunction with other sections under this Article, ascertain that all other equipment operated by or in conjunction with automatic fire detection system operates in proper fashion.

3.02 TESTING

- A. A factory-trained representative of the manufacturer shall supervise final testing of the complete system. This test of each component of the total system shall be made in the presence of the Engineer and in the presence of the enforcing fire agency. Upon completion, the Owner's maintenance staff shall be instructed in the testing and operation of the system by the manufacturer's representative.
- B. A factory-trained, certified representative shall be available a minimum of 16 hours (two 8-hour periods), to instruct the Owner in the use and maintenance of Fire Alarm hardware and software. The service shall include but not be limited to the following:
 - 1. Each manual alarm station shall be activated to ascertain that all fire-alarm horns operate satisfactorily.
 - 2. Each ionization and photoelectric detector shall be activated to demonstrate proper operation.
- C. Any equipment proving defective shall be immediately replaced with new equipment at no additional cost to the Owner.

- D. All wiring shall be checked and tested to ensure that there are no grounds, opens or shorts. The minimum allowable resistance between any two conductors or between conductors and ground is ten (10) megohms as checked by a Megger after all conduit, conductors, detector bases, etc., have been installed; but before the detector devices are plugged into the bases or end-of-line devices installed.
- E. Perform all electrical and mechanical tests required by the equipment manufacturer's form. In addition, measure and adjust each of the ionization and photoelectric detectors to the maximum stable sensitivity setting. This must be performed at the operational location of the unit and under normal operational environmental conditions in the area. Bench settings are not acceptable. A checkout report shall be prepared by the technician and submitted in triplicate, one copy of which will be registered with the equipment manufacturer. The report shall include, but not be limited to:
 - 1. A complete list of equipment installed and wired.
 - 2. Indication that all equipment is properly installed and functions and conforms to these specifications.
 - 3. Tests of individual zones.
 - 4. Serial numbers, locations by zone and model number for each installed detector.
 - 5. Voltage (sensitivity) settings for each ionization and photoelectric detector as measured in place with air conditioning system operating.
 - 6. Response time on thermostats and flame detectors (if used).
 - 7. Technician's name, certificate number and date.
 - 8. After completion of all the tests and adjustments listed above, the Contractor shall submit the following information to the Engineer:
 - a. Conduit layout diagrams including wire color code and/or tag number.
 - b. Complete as-built wiring diagrams, including room and equipment designation.
 - c. Detailed catalog data on all installed system components.
- F. The completed smoke detection system shall be tested to insure that it is operating properly. This test shall consist of exposing the installed units to a standard test. Acceptance of the system shall also require a demonstration of the stability of the system. This shall be adequately demonstrated if the system operates for a 30-day period without any unwarranted alarms. Should an unwarranted alarm(s) occur, the Contractor shall readjust or replace the

detector(s) and begin another 30-day test period. The Contractor shall recheck the detectors using the fire test after each readjustment or replacement of detectors. This test shall not start until the Owner has obtained beneficial use of the building under test. If the requirements provided in the paragraph above are not completed within one (1) year after beginning the tests described therein; the Contractor shall replace elements of the system with another acceptable manufacturer and the process repeated until acceptance of the equipment by the Owner.

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ARTICLE 32.14

WATER-BASED FIRE SUPPRESSION SYSTEM

SECTION 32

PART 1 GENERAL

1.01 SUMMARY

- A. Article Includes: Furnish all labor, materials, equipment, services, permits and incidentals required for modifications to provide complete, integrated and operating, water-based fire hose system for fire suppression for the equipment at the facilities of this project. Materials and equipment to be supplied shall be new and commercial quality.

1.02 REFERENCES

- A. National Fire Protection Association (NFPA):
 - 1. NFPA 14 Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems
 - 2. NFPA 20 Standard for the Installation of Stationary Fire Pumps for Fire Protection
- B. California Fire Code (CFC), 2016 edition
- C. California Building Code (CBC), 2016 edition
- D. California Electric Code (CEC), 2016 edition
- E. Underwriters' Laboratories Inc. (UL)
- F. Factory Mutual Systems (FM)
- G. California Code of Regulations, Division of Industrial Safety, State of California (Cal/OSHA)

1.03 SYSTEM DESCRIPTION

- A. Standpipe and Hose Fire Protection System: Provide replacement nozzles for the existing hose fire protection system throughout the facility and provide notification devices, control valves and other piping modifications as an upgrade to the existing pumped water supply system to meet the requirements of all governing local codes and as required by the California Building Code.
- B. Scope: The scope of work includes provision of an automatic operated fire protection and supervisory system including but not limited to:
 - 1. Design drawings and hydraulic calculations.
 - 2. All pipes, fittings, and valves.

3. Fire hoses and nozzles.
 4. Pipe hangers with seismic restraint.
 5. Fire pump accessories, including:
 - a. Controls, annunciation system, and wiring.
 - b. Pressure-relief and pressure-reducing control valve.
 - c. Alarm Devices
 6. Record drawings.
 7. Tests.
- C. Performance Requirements: System performance requirements shall meet or exceed requirements of local authority having jurisdiction.

1.04 SUBMITTALS

- A. Master Submittal: Submit a complete list of submittals in compliance with Paragraph 7.02 of the Specifications and as indicated on the Drawings. This list shall include catalog identification numbers, drawings, cut sheets, and other descriptive data and material necessary to completely define all components of the work. Favorable review of Master Equipment List will be tentative subject to submission of complete Shop Drawings indicating compliance with the Contract Documents.
- B. Shop Drawings and Product Data:
1. After receiving tentative favorable review of Master Equipment List, and before installation, the Contractor shall submit the following as a single complete initial submittal in accordance with Paragraph 7.04 of the Specifications:
 - a. Product data fully describing all items proposed for use to demonstrate that the equipment conforms to the Contract Documents.
 - b. Seismic separation assemblies, sway bracing assemblies, and related sketches.
 2. If the Contractor deems it necessary to depart from the Specifications, details of such departures, including changes in related portions of the project and the reasons therefor, shall be submitted with the Shop Drawings and other material specified above.
- C. Manuals: Furnish manufacturer's installation, lubrication, operation and maintenance manuals, bulletins, and spare parts lists.

- D. Affidavits: Furnish affidavits from the manufacturer stating that the equipment has been properly installed and tested and is ready for full-time operation.
- E. Performance Testing: Submit results of a performance test witnessed by the Engineer demonstrating satisfactory operation of the fire protection system equipment, showing it has been properly installed, adjusted, and is ready for full-time operation.
- F. Record Drawings: At the completion of contracted work, as defined in the Specifications and Drawings, submit a complete set of record drawings. Record drawings shall show the installed fire protection system configuration and include the mechanical, electrical, control, and alarm systems. Record drawings shall show as-built conditions. If the Contractor wishes, they may obtain Mylar reproducible of original working drawings and modify them as required.

1.05 QUALITY ASSURANCE

- A. Qualifications: Equipment furnished under this Article shall be supplied by a manufacturer who has been regularly engaged in the design and manufacture of the equipment for at least ten years. Demonstrate to the satisfaction of the Engineer that the quality is equal to equipment made by those manufacturers named herein.
- B. Permits and Inspection: Permits and inspection shall be in accordance with the General Conditions and Special Conditions.
- C. Contractor License: The Contractor installing the system modifications shall be licensed in accordance with the Business Professional Code, State of California, and shall be skilled and regularly engaged in the design, fabrication, installation and testing of fire sprinkler systems and have a California C16 license.
- D. Regulatory Requirements: All work and supplied equipment shall conform to the current edition of the following applicable codes and standards:
 - 1. CFC, with local amendments.
 - 2. CBC, with local amendments.
 - 3. CEC, with local amendments.
 - 4. California Code of Regulations, Title 8, Division 1, Chapter 4, Safety Orders, Division of Industrial Safety, State of California.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Immediately upon delivery to job site, place materials in area protected from weather. Use non-marring slings for loading, unloading, and handling units to prevent rope or cable damage to surfaces and protective wrappings.

PART 2 PRODUCTS**2.01 GENERAL**

- A. Provide materials specified herein for the modification of the standpipe hose protection outlets and the pipe, valve, and alarm notification accessories of the pumped water supply system. All materials utilized shall be UL listed and Factory Mutual approved. All materials installed shall adhere to the manufacturer's installation guidelines.

2.02 STANDPIPE AND HOSE SYSTEM

- A. Pipe and Fittings: Piping and fittings used in the installation of the standpipe and hose system shall be listed in NFPA 14 as an acceptable material with 250-psi minimum rated working pressure, at 100°F working temperature and 4-inch pipe size. All system piping shall be metallic and shall be protected against corrosion.

- 1. CUP Type T-1 Pipe:

- a. Pipe: Copper, ASTM B88. Type L (hard drawn).
- b. Joints: Brazed.
- c. Flux: BCuP-3 or BCuP-4 classification, conforming to AWS A5.8.
- d. Fittings:
 - (1) Wrought copper, ASTM B75 for materials and ANSI B16.22 for dimensions; or cast bronze, ASTM B62 for materials and ANSI B16.18 for dimensions.
 - (2) Mechanical grooved end fittings and couplings, listed by UL, may be used under approval from the District.

- B. Valves:

- 1. Pressure-Reducing and Pressure-Sustaining, Globe-Style, Control Valve:

- a. General: Hydraulic control valves shall consist of a main valve of globe configuration with hydraulically controlled, diaphragm-actuated stem assembly. Hydraulic control assemblies shall be as described in succeeding paragraphs.
- b. Main Valve Construction: Ductile-iron body and cover, 175-psi rated, with fusion epoxy lining, bronze trim, stainless steel stem, nut and spring, Buna-N diaphragm and seat disc. Provide valve in globe (straight-thru) configuration with 125-pound flange connections.

- c. Control: A spring-loaded, pressure-relieving pilot valve shall be plumbed to the diaphragm of the main valve to sustain inlet pressure above a minimum value ± 70 psi and not permit flow if the inlet pressure falls below such value. The inlet pressure setting shall be manually adjustable through the pilot valve. A spring-loaded, pressure-reducing pilot valve shall be plumbed to the diaphragm of the main valve in series with the pressure-relieving pilot to maintain the downstream pressure at or below a maximum value ± 25 psi. The downstream pressure setting shall be manually adjustable through the pilot valve.
 - d. Accessories:
 - (1) Check Feature: Provide accessory piping at downstream tap of main valve to piping connection at diaphragm with an in-line swing check valve to prevent reverse flow through the main valve.
 - (2) Limit Switch: Provide electronic limit switch assemblies on main valve for indication that valve has reached 'full-open' or 'full-closed' position.
 - (3) Opening/Closing Speed Controls: Provide adjustable needle valves on pilot piping between the upstream and downstream taps of the main valve to the piping connections at the diaphragm at all installations.
 - (4) Strainers: Provide bronze Y-strainer with stainless steel screen on pilot piping between the upstream tap of the main valve to the piping connection at the diaphragm.
 - e. Manufacturers: Cla-Val 92-01; (globe configuration); Watts; Singer; or equal.
2. Swing Check Valves 2-inch through 12-inch:
- a. Rating: 300 psi CWP
 - b. Type: Swing, metal seats, UL Listed/FM approved.
 - c. Connections: Flanged, 125-pound ANSI.
 - d. Materials: Ductile iron body and disc, EPDM disc liner and gasket, bronze seat. Provide fusion body epoxy coating of interior and exterior of valve body, conforming to AWWA C550
 - e. Manufacturers: United Water Products #8700; or equal.

3. Fire Department Pumper Connection Assembly:
 - a. General: An exposed-type fire department pumper connection assembly shall be provided, accessible for Fire Department uses and plumbed to the high-pressure service water system for distribution to the fire hose stations within the building.
 - b. Fire Department Connection: Fire Department pumper connection shall be of a brass body with dual inlet and dual clapper assembly to separate flow between inlets. Fire Department connection shall be UL listed and Factory Mutual approved for fire protection use with cast 'STANDPIPE' lettering denoting use for at hose stations. Hose connection and threads shall be compatible with equipment used by the Roseville Fire Department. Guardian Fire 6324, or equal. Provide spring-loaded check valve, cast brass construction with thread connections, 250-psi rating, UL Listed and FM approved to prevent outflow from building through fire department connection; Guardian Fire 6422, or equal.
- C. Nozzles: Provide 'All-Fog', adjustable flow rate nozzles rated for use on Classes A and B fires and on Class C fires in electrical hazard areas at distances of greater than 10 feet and voltages below 250,000 volts (UL listed at 1½-inch). Cast brass finish with rubber bumper. Croker 3470 Series, Elkhart Brass L(D)-205-EB, or equal, sized as indicated on the Drawings.
- D. Hangers and Supports: Piping shall be substantially supported to the building structure with appropriate hangers and supports. Materials used in the installation or construction of hangers and supports shall be listed and approved for such application. Hangers or supports not specifically listed for service shall be designed and bear the seal of a professional fire protection engineer registered in the State of California. All supports shall be designed for seismic loading as identified on the Drawings.

2.03 FIRE PUMP ANNUNCIATION AND NOTIFICATION SYSTEM

- A. General: The existing fire pump installation shall be provided with the following appliances to provide notification to the new building fire alarm system, specified in Article 32.13. Refer to drawings for location of appliance installation.
- B. Annunciation System:
 1. General: Products noted under this paragraph shall be designed for operation with and draw power from the Fire Alarm Control System specified under Article 32.13.
 2. Valve Supervisory Switch: Provide a 'special-purpose' valve supervisory switch containing one set of SPDT contacts with plug connector and designed for mounting on non-rising stem globe valve with handwheel where handwheel actuation 'breaks' cable sensor and closes contacts to

initiate alarm circuit. Switch shall be System Sensor PSP-1; Potter Signal PTS-C; or equal.

3. Water Flow Alarm Switch: Wet type fire sprinkler systems shall be equipped with the means to provide an alarm when a water flow condition exists. This shall be accomplished through the provision of a vane type water flow switch affixed to the system riser. Water vane type switch shall be labeled as to the correct orientation of flow when mounted on system piping. If drilling of the system riser is necessary to mount flow switch, the drilled-out disc shall be retrieved and attached to the mounting U-bolt of the flow switch. The vane type flow switch shall be equipped with an adjustable delay of audible alarm initiation. Adjustment range shall be from 0 seconds to 120 seconds. Vane type water flow switch shall be Viking/Potter Signal VSR-F; System Sensor WFDT; or approved equal.

2.04 ACCESSORIES

- A. Provide the appropriate accessories and fittings to conform to the requirements of the CFC, NFPA 14 and local ordinances.
- B. Provide signage as identified on the Drawings to meet the requirements of the CFC, NFPA 14, and local ordinances.

2.05 FINISHES

- A. The hydraulic control valve shall be supplied with a factory-applied epoxy coating. Accessory pipe, fittings, and controls for the control valve assembly shall be supplied with the manufacturer's standard factory paint finish.
- B. No brass or copper materials shall have a field-applied coating or protective finish.

2.06 SPECIAL TOOLS

- A. Furnish special tools that are necessary for the replacement of parts or adjustment of equipment.

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor shall examine the site and observe the conditions under which the work will be done and note other circumstances which will affect the work. No allowance will be made subsequently in this connection for any error, omission, or negligence on the Contractor's part.
- B. The design and installation of the automatic sprinkler system shall be complete with all necessary accessories for proper operation.

3.02 INSTALLATION**A. Piping:**

1. Persons who are regularly engaged in this type of work shall install the entire system.
2. The installation of hangers and pipe supports shall adhere to the requirements set forth in NFPA 14, Standard for Installation of Sprinkler Systems.
3. All piping and equipment shall meet the seismic anchorage requirements of Article 31.01.
4. Coordinate or modify sprinkler system layout with other trades so the fire sprinkler system does not interfere with light fixtures, mechanical ductwork, piping, electrical cable trays, conduit, etc. (light fixtures, mechanical ductwork, and piping have the right-of-way.) In areas where there are finished, lay-in, modular type ceilings, heads shall be located at centerline of lay-in panel.

B. Pipe Penetrations: Provide watertight seals at external wall and floor surface penetrations. Provide fire-rated seals at wall and floor penetrations to maintain fire rated separations noted on the Drawings.**C. Wall Escutcheons:** Escutcheons shall be provided at all penetrations of piping at exterior walls and into finished areas. Where finished areas are separated by partitions through which piping passes, escutcheons shall be provided on both sides of the partition. Escutcheons shall be one-piece, chrome plated in all occupied spaces and shall conceal openings in building construction. All escutcheons shall be firmly attached.**D. Painting:**

1. All manufacturers' standard finish equipment surfaces damaged during construction shall be brought to as-new condition by touchup or repainting to the satisfaction of the Owner or replaced with new undamaged equipment at no additional cost to the Owner.

E. Electrical Work:

1. All conduit, wire, and fittings required for the operation of electrically monitored fire alarm equipment described under this Article shall be provided and installed as specified in Article 36.
2. All conduits shall be properly identified.

3.03 FIELD TESTING

- A. Upon completion and prior to acceptance of the installation, the Contractor shall subject the system to tests required by NFPA 14, NFPA 20 and local authority having jurisdiction. Representatives of local authority having jurisdiction and Owner's representative shall witness all tests. The Contractor shall furnish the Owner with copies of all certificates.

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ARTICLE 32.15
CLEAN AGENT FIRE EXTINGUISHING SYSTEM

SECTION 32

PART 1 GENERAL

1.01 SUMMARY

- A. Article Includes: Chemicals, containers, piping, control panel, instrumentation, and accessories required to provide one, complete, single zone, dry Novec 1230 Clean Agent Fire Extinguishing System for the Adjustable Speed Control (ASC) Gallery of the Pacheco Pumping Plant.

1.02 REFERENCES

- A. Underwriters Laboratories Inc. (UL):
 - 1. UL Standard 864: Control Units and Accessories for Fire Alarm Systems
- B. National Fire Protection Agency (NFPA) Standards:
 - 1. NFPA 70 National Electric Code
 - 2. NFPA 72 National Fire Alarm Code
 - 3. NFPA 75 Protection of Electronic Computer/Data Process Equipment
 - 4. NFPA 76 Fire Protection for Telecommunications Systems
 - 5. NFPA 2001 Clean Agent Fire Extinguishing Systems
- C. U.S. Environmental Protection Agency SNAP (Significant New Alternate Policy) Program
- D. California Fire Code (CFC), 2013 edition

1.03 SUBMITTALS

- A. Shop Drawings and Product Data: Submit the following as a single complete initial submittal in accordance with Special Provisions, Sections 7.04 and 7.05:
 - 1. Product data fully describing all items proposed for use to demonstrate that the equipment conforms to the Specifications.
 - 2. System layouts and/or schematics, stamped by a fire protection engineer or fire protection contractor (C-16), registered in the State of California.
 - 3. Elementary and connection wiring diagrams clearly showing external connections to other equipment.

- B. Manuals: Submit an operation and maintenance manual in accordance with Special Provisions, Article 14.10.02, after all other submittals in this Article have been approved. Manual shall include operations and maintenance information on all system components. Include catalog information, in addition to or duplicates of previously submitted information, to provide a complete description of all system components.
- C. Affidavits: Submit affidavits from the manufacturer stating that the equipment has been properly installed, adjusted, and tested and is ready for full-time operation.
- D. As-Built Drawings: Upon completion, Contractor shall provide two copies of as-built drawings showing installation details, actual equipment locations, conduit and pipe routing, and cylinder storage positions.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer: Equipment furnished under this Article shall be supplied by a single manufacturer who has been regularly engaged in the design and manufacture of the equipment for at least 5 years, except where specifically indicated in this specification. The manufacturer of the system shall have been certified to ISO 9001 for a minimum period of 5 years for the design, production and distribution of fire detection, fire alarm, and fire suppression systems. Demonstrate to the satisfaction of the Owner's Representative that the quality is equal to equipment made by those manufacturers named herein.
- B. Contractor (Supplier):
 - 1. The system shall be supplied and installed by a factory-authorized distributor of the submitted manufacturer's products. The Contractor shall be authorized to calculate/design, install, test, and maintain the system and shall be able to produce a certificated stating as such upon request.
 - 2. Contractor License: The Contractor installing the fire protection system shall be licensed in accordance with the Business Professional Code, State of California, and shall be skilled and regularly engaged in the design, fabrication, installation, and testing of fire protection systems and have a California C16 license.
- C. Permits and Inspection: Permits and inspection shall be in accordance with the General Conditions and Special Conditions.
- D. Regulatory Requirements: All work and supplied equipment shall conform to the 2013 edition of the following applicable codes and standards:
 - 1. CFC, with local amendments.

2. CBC, with local amendments.
3. CEC, with local amendments.
4. California Code of Regulations, Title 8, Division 1, Chapter 4, Safety Orders, Division of Industrial Safety, State of California.

PART 2 PRODUCTS**2.01 EQUIPMENT****A. General:**

1. All equipment in this Article shall be supplied by a single manufacturer. Kidde 'ADS'; or equal.
2. Systems shall be designed in accordance with the standards of NFPA 72 and NFPA 2001.

B. Clean Agent Storage:

1. Fire suppression agent shall be Novec 1230 (carbon, flourine, and oxygen compound), with a nitrogen expelling agent. The agent shall be stored in listed, floor-mounted steel cylinder containers, super-pressurized with nitrogen gas to provide total flood suppression of the area to be protected within 10 seconds at a storage location remote from the area to be protected, designed for the facilities described below, in accordance with NFPA 2001. Cylinders shall be painted red, and include discharge valves, level indicators, safety cap, and nameplate. Preliminary sizes are noted in the Schedule below:

Location	Room Dimensions, Approx. (Area x Height)	Estimated Cylinder Capacity	Cylinder Storage Distance from Protection Area
ASC Gallery	185-foot x 16-foot floor area; flat ceiling, 22 feet	3000 lbs.	~150 feet, equivalent length

2. Cylinder shall include pressure gauge and switch for supervision of cylinder pressure.
3. Cylinders shall include pressure relief device set to release upon internal pressure of 805 psi.
4. Cylinders shall be located remote from the hazard area as indicated on the Drawings.

5. Cylinders shall be securely mounted to building structure through anchors rated for 1000-lb. thrust for 5 seconds. Cylinders shall be set on raised pad, 3 inches above floor surface.

C. Distribution System:

1. Distribution piping shall be designed so that the discharge time to achieve 95% of the minimum design concentration for flame extinguishment shall not exceed 10 seconds.
2. The system capacity shall be designed so that 85% of the minimum design concentration shall be maintained for a minimum period of 10 minutes.
3. Discharge nozzles shall be 180- and/or 360-degree styles and distribute the fire suppression agent evenly throughout the room(s).
4. Distribution piping shall be of material and service rating in accordance with NFPA 2001 for the selected clean agent.
5. Provide Teflon tape only as sealant material for threaded fittings.
6. Piping and supports between the cylinders and nozzles shall as recommended by the manufacturer.

D. Control Panel, Actuation, Detection and Alarm Systems:

1. Provide one horn/strobe inside of room to be protected as first-stage 'fault' alarm and one blue strobe inside of room to be protected as second-stage 'pre-discharge' alarm.
2. Provide three horn/strobes for installation outside of room to be protected, one at each as 'system activation' alarm.
3. Control Panel: Provide a fire control panel with alarm and suppression capabilities in a NEMA 1 rated enclosure, installed in the vicinity of the clean agent storage cylinders, as indicated on the Drawings. The unit shall be provided with a 120-VAC power source rated at 15 amps, supplied from a dedicated circuit. Supplier shall be responsible for providing all wiring, conduit, transformers, etc. serving all system components for a complete and operable system. Control panel shall include a 24-VDC power supply and self-contained battery charger, and automatically switch to battery power in case of AC power loss. Provide panel with dry contacts for connection to the building fire alarm panel. Provide two Class B alarm detection circuits, compatible with contact type devices. A field selectable time delay shall be provided with the second detection circuit.

4. Provide manual release station for manually initiating the suppression system. Release shall be handle-actuated with hinged protective cover over handle. Manual release station shall by-pass any time delay. Locate within room to be protected, clearly labeled, at each exit of the room to be protected as noted on the Drawings.
 5. Provide abort switch for momentarily disabling the firing circuit. Switch shall be overridden by activation of the manual release station. Locate switch adjacent to manual release stations.
 6. Provide a minimum of two photoelectric smoke detectors located and spaced to provide no more than 100 square feet of coverage per detector. Smoke detectors shall be provided as specified in Article 32.13 and shall be compatible for use with the above control panel.
- E. Control Sequence:
1. The first-stage alarm shall be activated when a single detector alarms, and the following functions shall occur:
 - a. Illuminate the 'Alarm' lamp on the Clean Agent Control Panel.
 - b. Activate first stage horn/strobe within the ASC Gallery.
 - c. Relay remote alarm signal to building fire alarm panel. (HVAC system shutdown shall be initiated via the building fire alarm control panel).
 2. When two or more detectors alarm, the second-stage alarm shall activate, and the following functions shall occur:
 - a. Illuminate the 'Pre-Discharge' lamp on the Clean Agent Control Panel.
 - b. Activate second stage horn/strobe within the ASC Gallery.
 - c. Start 0 to 60-second adjustable time delay. (The 'System Abort' sequence shall also be enabled at this time).
 3. After completion of the time delay sequence, the Novec 1230 extinguishing agent shall be discharge along with the following:
 - a. The horn/strobes throughout the building shall be activated.
 - b. Illuminate the 'System Activation' lamp on the Clean Agent Control Panel.
 - c. Shut-off all power to the high-voltage equipment.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install all equipment in strict conformance with the manufacturer's installation instructions.
- B. All pipes shall be reamed, blown clear with air or nitrogen gas, and swabbed with suitable solvents to remove burrs, mill varnish, and oils prior to assembly.
- C. All piping and equipment shall meet the seismic anchorage requirements of Article 31.01.
- D. Coordinate or modify sprinkler system layout with other trades so the fire sprinkler system does not interfere with light fixtures, mechanical ductwork, piping, electrical cable trays, conduit, etc. (light fixtures, mechanical ductwork, and piping have the right-of-way.) In areas where there are finished, lay-in, modular type ceilings, heads shall be located at centerline of lay-in panel.
- E. Electrical Work:
 - 1. All conduit, wire, and fittings required for the operation of electrically monitored fire alarm equipment described under this Article shall be provided and installed as specified in Article 36.
 - 2. All conduits shall be properly identified.

3.02 PIPE MARKERS

- A. Provide markers for all piping in accordance with Article 31.04.
- B. Provide facility safety signage identifying the clean agent hazard in accordance with the manufacturer's requirements. Signage shall be in conformance with ANSI Z535.2, 'Standard for Environmental and Facility Safety Signage'.

3.03 SYSTEM INSPECTION AND TRAINING

- A. The equipment supplier shall supply a competent field service engineer to thoroughly check, inspect, and perform preliminary testing after installation.
- B. Wiring shall be tested for proper connection, continuity, and resistance to ground.
- C. Provide functional testing of system and equipment interlocks, including, but not limited to:
 - 1. Testing of smoke detectors.
 - 2. Testing of audible and visual alarms.

- D. Equipment supplier shall provide operational training to Staff identifying emergency procedures, abort functions, control panel operation, trouble procedures, and safety requirements.

3.04 ACCEPTANCE TESTING

- A. Submit 'Test Plan' for review, describing how the system will be tested, at the time of 'as-built' drawing and O&M Manual submittals. Test Plan shall include step-by- step description of all tests and test apparatus required. Test shall demonstrate that the entire control system functions as intended. Testing shall be conducted in presence of the Owner and shall not be conducted until Test Plan is approved.
- B. Room pressurization test shall be conducted to determine the presence of openings that could affect the clean agent concentration levels. Testing shall be in accordance with NFPA 2001. Procedures for room pressurization test shall be submitted in the Test Plan. Submittal of test reports shall be in accordance with Section 9.09 of the Special Provisions.
- C. Room inspection shall be made by the system supplier of door seals, weather-stripping and caulking, to ensure that the areas to be protected will contain the clean agent for the required suppression period. Responsibility for determining corrective action for sealing of room shall be the responsibility of the system supplier.
- D. Upon acceptance of testing, system shall be placed in operation within a 24-hour period. Contractor shall provide certification that containers are filled and pressurized as required.

END OF ARTICLE

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ARTICLE 35.01 STRUCTURAL METAL FRAMING

SECTION 35

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Structural steel, stainless steel or aluminum, such as beams, channels, angles, tees, bars, pipe, tubing and plates (connection and base plates).
2. Fabricated metal items, such as pipe supports, brackets, hangers, equipment supports, and lift hooks.
3. Fabricated tanks, hoppers, and similar structures, if not specified elsewhere.
4. All structural metal framing.

1.02 REFERENCES

A. Aluminum Association (AA):

1. AA Manual-Aluminum Design Manual

B. American Institute of Steel Construction (AISC) Specifications:

1. ANSI/AISC 360-05 Specification for Structural Steel Buildings

C. Research Council on Structural Connections (RCSC):

1. RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts, 2004

D. American Iron and Steel Institute (AISI).

E. American National Standards Institute (ANSI):

1. ANSI H35-1 Alloy and Temper Designation Systems for Aluminum

F. ASTM International (ASTM) Standard Specifications:

1. ASTM A36 Structural Steel
2. ASTM A53 Pipe, Steel, Black and Hot-dipped, Zinc-coated Welded and Seamless
3. ASTM A108 Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality

4. ASTM A123 Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products
5. ASTM A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
6. ASTM A276 Stainless Steel Bars and Shapes
7. ASTM A370 Test Methods and Definitions for Mechanical Testing of Steel Products
8. ASTM A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
9. ASTM A653 Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
10. ASTM A992 Specification for Steel for Structural Shapes for Use in Building Framing
11. ASTM B633 Electrodeposited Coatings of Zinc on Iron and Steel
12. ASTM C827 Test Method for Early Volume Change of Cementitious Mixtures
13. ASTM C1107 Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
14. ASTM E8 Test Methods for Tension Testing of Metallic Materials
15. ASTM E165 Practice for Liquid Penetrant Inspection
16. ASTM E709 Practice for Magnetic Particle Examination
17. ASTM F2329 Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

G. American Welding Society (AWS):

1. AWS D1.1 Structural Welding Code - Steel
2. AWS D1.2 Structural Welding Code - Aluminum
3. AWS D10.4 Recommended Practices for Welding Austenitic Chromium-Nickel Stainless Steel Piping and Tubing
4. AWS A4.3-93R Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding
5. AWS A5.1 Mild Steel Covered Arc Welding Electrodes

6. AWS A5.3 Aluminum and Aluminum Alloy Electrodes for Shielded Metal Arc Welding
 7. AWS A5.4 Covered Corrosion-Resisting Chromium-Nickel Steel Welding Electrodes
 8. AWS A5.5 Low Alloy Steel Covered Arc Welding Electrodes
 9. AWS A5.9 Corrosion-Resisting Chromium-Nickel Steel Base and Composite Metal Cored and Stranded Welding Electrodes and Welding Rods
 10. AWS A5.10 Aluminum and Aluminum Alloy Bare Welding Rods and Electrodes
 11. ANSI/AWS B4.0-98 Standard Methods for Mechanical Testing of Welds – U.S. Customary
 12. AWS B5.1-2003 Standard for the Qualification of Welding Inspectors
 13. AWS C4.1 Oxygen Cutting Surface Roughness Gauge and Wall Chart for Criteria Describing Oxygen-Cut Surfaces
- H. American Society for Nondestructive Testing (ASNT):
1. ASNT SNT TC-1a-2001 Recommended Practice for the Training and Testing of Nondestructive Testing Personnel
 2. ANSI/ASNT CP-189-2001 Standard for the Qualification and Certification of Nondestructive Testing Personnel
- I. Federal Emergency Management Agency (FEMA):
1. FEMA 350 Recommended Seismic Design Criteria for New Steel Moment-Frame Buildings, July 2000
- J. International Code Council (ICC)
- K. International Building Code (IBC) 2018 Edition and California Building Code (CBC) 2019.
- 1.03 SUBMITTALS
- A. Submit in Accordance with Section 01300.
- B. Product Data:
1. Hangers, pipe and equipment supports (shelf items).

2. Electrode manufacturer's data and product data, including electrodes to be used for dissimilar metals.
 3. Insulation between dissimilar metals.
 4. Manufacturer's product data sheets or catalog data for SMAW, FCAW and GMAW composite (cored) filler metals to be used.
 5. Non-shrink grout.
- C. Shop and Erection Drawings:
1. Structural framing.
 2. Connection material specifications.
 3. Gusset and base plates drawn to scale.
 4. Field assembly or erection sequence.
- D. Quality Assurance:
1. Welder performance qualification test records "welder's certification".
 2. Written Welding Procedure Specifications (WPSs) in accordance with AWS D1.1 requirements for each different welded joint proposed for use whether prequalified or qualified by testing.
 3. Procedure Qualification Record (PQR) in accordance with AWS 1.1 for all procedures qualified by testing.

1.04 QUALITY ASSURANCE

- A. General:
1. Furnish materials and fabricated items from an established and reputable manufacturer or supplier. Fabricator and Erector shall both be AISC certified for the work that they are performing.
 2. Supply all new materials and fabricated items made from first class ingredients and construction and guaranteed to perform the service required.
 3. The Contractor is responsible for preparing and submitting written WPSs. WPSs for each joint type shall indicate proper AWS qualification and be available where welding is performed. WPSs shall be included with any shop drawings referencing welds. WPSs shall include the manufacturer and specific electrode.
 4. Quality control and quality assurance shall be provided in accordance with AISC 341 Appendix Q.

B. Codes and Standards:**1. Metalwork:**

- a. Steel: AISC Specification.
- b. Aluminum: AA Manual.

2. Welding:

- a. Steel: AWS D1.1.
- b. Aluminum: AWS D1.2.
- c. Stainless Steel: AWS D10.4.

3. Welders:

- a. Qualify welders in accordance with AWS D1.1 for each process, position, and joint configuration.
- b. All welding operators are subject to examination for requalification at any time during the progress of the work.

C. Tests:

- 1. General: The Owner will provide Special Inspection, defined by CBC Section 1704, for welding and high-strength bolting. Visual welding inspection and nondestructive testing (NDT) shall be conducted in accordance with a written practice by personnel qualified in accordance with AISC 341 Appendix W.
- 2. Weld Tests: By a testing laboratory, selected by Engineer and paid by Owner.
 - a. Visual inspection:
 - (1) Check fit-up of joint materials. Verify satisfactory alignment of material. Verify gaps and bevels of penetration welds.
 - (2) Check during welding. Verify satisfactory technique is used.
 - (3) Check after welding completed and cleaned by wire brush or chipping hammer.
 - (4) Inspect with magnification when necessary and under strong, adequate light.
 - (5) Inspect for the following defects:
 - (a) Surface cracking.
 - (b) Porosity.

- (c) Excessive roughness.
- (d) Unfilled craters.
- (e) Gas pockets.
- (f) Undercuts.
- (g) Overlaps.
- (h) Size.
- (i) Insufficient throat and concavity.

b. Extent of testing:

- (1) Visual inspection of all welds.
- (2) Measurement of weld profiles for 25% of all welds at random.

D. Additional Tests: Provide and pay for all necessary additional tests made on welds or bolts required to repair or replace faulty work performed during the original fabrication.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Handle, ship and store material in a manner that will prevent distortion, rust, damage to the shop coat or any other damage.
- B. Store material in a clean, properly drained location out of contact with the ground.
- C. Ensure that dissimilar metals are not in contact with each other.
- D. Replace or repair all damaged material in an approved manner.

PART 2 PRODUCTS

2.01 STRUCTURAL STEEL MEMBERS

- A. W-Shapes and WT-Shapes: ASTM A992, $f_y = 50$ ksi, $f_u = 65$ ksi.
- B. M-, S-, and HP-Shapes and Channels, Angles, Structural Tees, Plates and Similar Items: ASTM A36, $f_y = 36$ ksi, $f_u = 58$ ksi. Except plates for W-Shapes and WT-Shapes ASTM A572, Grade 50.
- C. Hollow Structural Sections (HSS): Rectangular and square, ASTM A500, Grade B, $f_y = 46$ ksi, $f_u = 58$ ksi. Round, ASTM A500, Grade B, $f_y = 42$ ksi, $f_u = 58$ ksi.
- D. Steel Pipe: ASTM A53 Type E or S, Grade B, $f_y = 35$ ksi, $f_u = 60$ ksi.

2.02 FABRICATED ALUMINUM ITEMS

- A. Material: ANSI H35-1 Alloy and Temper 6061-T6 with an anodized finish.

- B. Surfaces in Contact With Concrete or Masonry: Shop prime with a bituminous mastic or zinc chromate coating.
- C. Bolted Connections: Provide galvanized steel bolts unless noted otherwise on contract drawings.

2.03 METAL FASTENINGS

- A. See Article 35.02.

2.04 WELDING ELECTRODES, FILLER METALS

- A. Steel:
 - 1. AWS A5.1 or A5.5, E70XX category.
 - 2. AWS A5.20, A5.29, E7XTX-X except -2, -3, -10, -GS for FCAW.
 - 3. AWS A5.17 or A5.23, F7XX-EXXX for SAW.
- B. Aluminum: AWS A5.3 or A5.10.
- C. For welding dissimilar metals, submit the appropriate electrodes for Product Review.

2.05 GALVANIZING

- A. Hot-dip galvanize all exterior and exposed steel items, except when specified otherwise.
 - 1. Sheet steel, plain or shaped: ASTM A653, coating designation G 90.
 - 2. Products fabricated from rolled, pressed and forged steel shapes, plates, bars and strip 1/8-inch-thick or heavier: ASTM A123.
 - 3. Structural tubing and pipe: ASTM A53
 - 4. Grind smooth fabricated items at welded joints, edges, and corners, and galvanize after fabrication.
 - 5. Items that are specified to receive paint or a coating after galvanizing shall receive no post treatment baths and shall not be stacked or stored in a wet environment until coated.
- B. Repair Materials: Gal-Viz by Thermacote Welco, Pasadena, CA; ReGalv by Rotometals, Inc., San Francisco, CA; or equal.

2.06 NON-SHRINK GROUT

- A. ASTM C1107 with no shrinkage as measured by ASTM C827. Furnish a pre-mixed product consisting of properly proportioned amounts of non-metallic dimensionally stable material to which water is added.

2.07 MISCELLANEOUS ITEMS

- A. Furnish all items required to complete the project, but not specified herein.

2.08 FABRICATION

- A. Structural Steel Work: Comply with the applicable provisions of the AISC Specification, the AISC Standard Practice and AWS D1.1. Weld only in accordance with favorably reviewed WPSs, which are to be available to welders and inspectors during the production process. Provide workmanship equal to standard commercial practice in modern structural shops.
1. Fabricate and assemble in the shop to the greatest extent possible, and deliver to the project as a unit ready for installation. Coordinate the work, making all provisions necessary for the passage of all applicable work into, and attachment to, the structures. Make joints carefully and neatly, with corners mitered and spliced, bolted, screwed, or welded together.
 2. Make proper allowance for the expansion and contraction of the metals, and of the materials to which they are fastened.
 3. Make completely watertight joints on exterior work.
 4. Shape all members correctly, with no kinks, twists, dents, or other blemishes prior to erection. Evenly spring all curved work.
 5. Make exposed edges free of burrs, sharp edges or corners. Make corners rounded or chamfered. Grind exposed welds smooth when specified.
 6. Include supplementary parts necessary to complete each item, even though such work may not be definitely specified. Provide all such miscellaneous metalwork required by the project in accordance with good accepted standard practice.
 7. Review monorail supports and splices with the hoist manufacturer.
 8. All materials shall be galvanized, stainless steel, or factory epoxy coated.
- B. Aluminum Work:
1. Comply with the applicable provisions of the AA Manual and AWS D1.2.
 2. Back painting: When aluminum is in contact, such as with concrete, mortar, masonry, or adsorptive materials subject to wetting, including condensation, give the contact surfaces a brush coat of cut-back asphaltic, or coal tar paint. Submit paint for favorable review.
- C. Base and Bearing Plates: Furnish under all columns, pipe supports, including rack type, supports for tanks, equipment frames and cabinets, and similar items. Provide rounded or chamfered corners.

- D. Dissimilar Metals: Insulate the faying surfaces with a brush coat of cut-back asphaltic or coal tar paint or by gasketing. Submit for favorable review.
- E. Metals in contact with cementitious or other material: Provide finish coating prior to erection.

2.09 SOURCE QUALITY CONTROL

- A. Material Tests: Not required for materials identified with valid mill test records.
 - 1. Unidentified materials: Test samples from each 20 tons of each material, or fraction thereof. Perform tension and bend tests, conforming to ASTM A370 for steel. Perform tension tests conforming to ASTM E8 for aluminum.
 - 2. Do not provide unidentified stainless steel.
- B. Welding:
 - 1. Qualify welders in accordance with AWS D1.1 for each process, position, and joint configuration.
 - 2. Weld only in accordance with favorably reviewed WPSs, which are to be available to welders and inspectors during the production process.
- C. Tolerances: AISC Standard Practice.
- D. Fabrication Tests: Standard and extent: See paragraph 1.04.

PART 3 EXECUTION

3.01 ERECTION

- A. Structural Steel Work:
 - 1. Erect members in accordance with the AISC Specification, and the AISC Standard Practice except as modified.
 - 2. Incorrect fabrication or damaged members:
 - a. When a condition exists whereby parts cannot be assembled or fitted properly as a result of errors in fabrication, or of deformation due to handling or transportation, report the condition immediately. The method of correction must be approved before any corrective work is done. Make the corrective work in the presence of the Engineer.
 - b. Straighten plates and angles or other shapes using approved methods.

- c. Do not heat already heat-treated parts for straightening.
 - 3. Connections:
 - a. Provide anchor bolts and other connections between structural steel and foundations.
 - b. Set all anchor bolts by template, with provisions to hold bolts rigid and in correct position with respect to plan and elevation.
 - c. Detail any undesigned connections in accordance with the AISC Specification
 - d. Do not increase any hole diameter or slot length without the Engineer's approval.
 - 4. Install work anchored in sleeves set in concrete with non-metallic non-shrink grout. Allow a $\frac{1}{4}$ -inch minimum clearance between items anchored and the sleeve.
 - 5. Where metal is fastened to concrete, make the connections by anchor bolts, or by fastenings embedded in concrete, such as adhesive, or expansion anchors, installed in accordance with manufacturer's recommendations and AISC. Contractor shall not substitute post-installed fasteners for cast-in-place bolts without prior written permission from the Engineer.
 - 6. Provide a 4-inch band of coal-tar epoxy applied, half in concrete and half in air, to galvanized or painted steel, partially embedded in concrete and subject to weathering.
 - 7. Provide grout pads below base and bearing plates of non-shrink non-metallic grout having a minimum thickness of $\frac{3}{4}$ -inch unless otherwise noted. Do not bear directly on concrete slabs or equipment bases.
 - 8. Provide leveling nuts on anchor bolts, below base plates, and adjust prior to grouting.
 - 9. Complete the work square, plumb, straight and true, accurately fitted, and with tight joints and intersections.
- B. Welding:
- 1. Weld only in accordance with favorably reviewed WPSs, which are to be available to welders and inspectors during the production process. Perform all welding by the shielded electric arc method in accordance with AWS D1.1.

2. Repair and make additional inspections, at the Contractor's expense, of the weld areas which have been rejected as a result of inspection. Follow this procedure until the welds are acceptable to the Engineer.
 3. Qualify welders in accordance with AWS D1.1 for each process, position, and joint configuration.
 4. All tack welds shall be of the same quality as the final welds. This includes preheat requirements. All tack welds not incorporated in the final welds shall be removed.
- C. Repair of Galvanized Coating:
1. Repair surfaces damaged by cutting or welding by the heated repair method. Repair handrails or other surfaces that will not be painted and that are field welded or damaged by the heated galvanize repair method.
 2. Heat substrate to 600°F, or apply hot process touch-up material right after welding before metal has cooled below 600°F.
 3. Rub bar of specified galvanize repair material over surface of hot substrate to apply a uniform coating of zinc. Wire brush hot coating with a clean wire brush to smooth out and bond zinc coating to substrate to apply a uniform coating of zinc.

3.02 FIELD QUALITY CONTROL

- A. Welding:
1. Qualify welders in accordance with AWS D1.1 for each process, position, and joint configuration.
 2. The Owner's testing agency will inspect shop or field welding for conformance with AWS D1.1 requirements and will verify that welds are made in accordance with favorably reviewed WPSs.
- B. Erection Sequence: Verify each stage is completed before proceeding to the next.
- C. Tolerances: AISC Standard Practice.
- D. Erection Tests: Standard and extent: See paragraph 1.04.

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ARTICLE 35.02
STRUCTURAL METAL
FASTENERS AND CONCRETE ANCHORS

SECTION 35

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. All anchors, including mechanical and adhesive anchors, adhesive rebar dowels, eye bolts, turnbuckles, cable clamps, bolts, nuts, washers, inserts, and other metal fasteners not specified elsewhere.

1.02 REFERENCES

- A. American Institute of Steel Construction Specifications:
 - 1. ANSI/AISC 360-16 Specification for Structural Steel Buildings
- B. Research Council on Structural Connections:
 - 1. RCSC Specification for Structural Joints using ASTM A325 or A490 Bolts, 2009
- C. American Iron and Steel Institute (AISI)
- D. American National Standards Institute:
 - 1. ANSI B18-2-1 Square and Hex Bolts and Screws
 - 2. ANSI B18-2-2 Square and Hex Nuts
 - 3. ANSI B18-21-1 Lock Washers
 - 4. ANSI B18-22-1 Plain Washers
- E. ASTM International Standard Specifications:
 - 1. ASTM A123 Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products
 - 2. ASTM A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 3. ASTM A325 Structural Bolts, Steel, Heat-Treated
 - 4. ASTM A370 Test Methods and Definitions for Mechanical Testing of Steel Products
 - 5. ASTM A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 - 6. ASTM A525 Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

7. ASTM A563 Carbon and Alloy Steel Nuts
8. ASTM B633 Electrodeposited Coatings of Zinc on Iron and Steel
9. ASTM B695 Coatings of Zinc Mechanically Deposited on Iron and Steel
10. ASTM E8 Test Methods for Tension Testing of Metallic Materials
11. ASTM F436 Hardened Steel Washers
12. ASTM F844 Washers, Steel, Plain (Flat), Unhardened for General Use
13. ASTM F959 Compressible-Washer-Type Direct Tension Indicator for Use with Structural Fasteners
14. ASTM F1554 Anchors Bolts, Steel, 36, 55, and 105-ksi Yield Strength
15. ASTM F1941 Electrodeposited Coatings on Mechanical Fasteners
16. ASTM F2329 Zinc Coating, Hot-Dip, Requirements for Application to Carbon

F. International Code Council (ICC) Evaluation Service Reports:

1. AC 01 Acceptance Criteria for Expansion Anchors in Masonry Elements
2. AC 58 Acceptance Criteria for Adhesive Anchors in Masonry Elements
3. AC 60 Acceptance Criteria for Anchors in Unreinforced Masonry Elements
4. AC 106 Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements
5. AC 193 Acceptance Criteria for Mechanical Anchors in Concrete Elements
6. AC 308 Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements

1.03 SUBMITTALS

- A. Submit in accordance with Section 01300.
- B. Product Data:
 1. Adhesive anchors, reinforcing steel dowels and expansion anchors.
 2. Insulation between dissimilar metals.

- C. Samples: Manufacturer's latest standard product: Specify special or unique products.
- D. ICC Evaluation Service evaluation reports or equivalent IAPMO evaluation reports for all anchors submitted, demonstrating compliance with 2018 IBC requirements and applicable ICC acceptance criteria.
- E. List of all anchors to be used including:
 - 1. Location, diameter, material type, number and length of anchors.

1.04 QUALITY ASSURANCE

- A. General:
 - 1. Furnish materials and fabricated items from an established and reputable manufacturer or supplier.
 - 2. Supply all new materials and fabricated items made from first class ingredients and construction and guaranteed to perform the service required.
 - 3. Installer Training: Conduct a thorough training with the manufacturer or the manufacturer's representative for the Contractor on the project. Training to consist of a review of the complete installation process for drilled-in anchors, to include but not limited to:
 - a. Hole drilling procedure.
 - b. Hole preparation and cleaning technique.
 - c. Adhesive injection technique and dispenser training/maintenance.
 - d. Rebar dowel preparation and installation.
- B. Codes and Standards:
 - 1. Bolting:
 - a. General: AISC Specifications
 - 2. Anchoring to Concrete
 - a. General: ACI 318
- C. Tests:
 - 1. General: The Owner shall provide Special Inspections, defined by IBC Chapter 17 and as noted in the ICC-ES or IAPMO evaluation report for the anchor. The Contractor shall provide and pay for verification testing for mechanical and adhesive anchoring systems described below.

2. Installation inspection shall be periodic Special Inspection or continuous Special Inspection as required by the ICC-ES or IAPMO evaluation report or by the Design or Specialty Engineer. Special Inspector shall visually inspect anchor layout, including required substrate thickness, anchor location, embedment, spacing, and edge distance, and observe hole cleaning procedures and the equipment to be used for adhesive anchor installation.
- D. Additional Tests: Contractor shall provide and pay for all necessary additional tests and Special Inspections made on welds or bolts required to repair or replace faulty work performed during the original fabrication.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Handle, ship and store material in a manner that will prevent distortion, rust, damage to the shop coat or any other damage.
- B. Store material in a clean, properly drained location out of contact with the ground.
- C. Ensure that dissimilar metals are not in contact with each other.
- D. Replace or repair all damaged material in an approved manner.
- E. Store anchors in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 METAL FASTENERS, ANCHORS, AND FASTENING HARDWARE.

- A. General:
 1. For anchors, provide anchor embedment depth, edge distance, and spacing as shown on the Drawings, favorably reviewed anchorage design submittals and Shop Drawings, and in accordance with manufacturer's recommendations for published design loads.
 2. Provide named mechanical anchors and anchor adhesives where noted on Drawings. Otherwise, submit supporting documentation and applicable connection and anchorage design calculations for the proposed product, in accordance with Section 1.03, to demonstrate that the proposed product is a direct replacement for the named product. The connection and anchorage design calculations shall be signed and stamped by a Civil or Structural Engineer licensed in the State where the project is located.
 3. All reinforcing steel indicated to be embedded in hardened concrete shall be embedded using post-installed injectable adhesive anchoring systems.

B. Materials and Finishes:

1. Hot Dip Galvanizing: Steel hardware, nuts, bolts, washers, anchors, and threaded rods: ASTM F2329 or ASTM A153.
2. Mechanical Zinc Plating/Mechanical Galvanizing: Minimum ASTM B695 Class 55 Type 1.
3. Size galvanized and plated nuts to accommodate galvanized and plated threads.
4. Repair Materials: Gal-Viz by Harris Products Group; ReGalv by Rotometals, Inc.; or equal.
5. Unless otherwise noted, for dry interior spaces, all metal fasteners, anchors, and fastening hardware shall be hot dip galvanized.
6. Unless otherwise noted, post-installed mechanical anchors that are not offered in hot-dip galvanized by the manufacturer shall be mechanical galvanized.

C. Nuts:

1. Carbon Steel:
 - a. For Non-High Strength Bolts, Headed Anchor Bolts, and Threaded Anchor Rods: ASTM A563 Grade A Hex or Heavy Hex.
 - b. For High Strength Bolts, Headed Anchor Bolts, and Threaded Anchor Rods: ASTM A563 Grade DH Heavy Hex.
 - c. Dimensional requirements: ASME B18.2.2.

D. Washers:

1. Carbon Steel:
 - a. For Non-High Strength Bolts, Headed Anchor Bolts, and Threaded Anchor Rods: ASTM F844 Round Flat Washer.
 - b. For High Strength Bolts, Headed Anchor Bolts, and Threaded Anchor Rods: ASTM F436, Type 1 Circular Washer.
 - c. High Strength Direct Tension Indicators: ASTM F959.
 - d. Split lock washers.
 - e. Dimensional requirements: ASME B18.21.1.

- E. Threaded Anchor Rods:
 - 1. Straight, fully threaded.
 - 2. Carbon Steel:
 - a. Non-High Strength: ASTM F1554, Grade 36.
 - b. High Strength: ASTM F1554 Grade 55 or 105, or ASTM A193 B7.
- F. Bolting:
 - 1. Bolts:
 - a. Carbon Steel:
 - (1) Non-High Strength: ASTM A307 Grade A Hex Head.
 - (2) High Strength: ASTM F3125 Grade A325 Type 1 Heavy Hex Head.
 - (3) Dimensional requirements: ASME B18.2.1.
- G. Cast-in-Place Anchors:
 - 1. Headed Anchor Bolts:
 - a. Carbon Steel:
 - (1) Non-High Strength: ASTM F1554 Grade 36.
 - (2) High Strength: ASTM F1554 Grade 55 or 105.
 - 2. Threaded Anchor Rods:
 - a. See Section 2.01.E.
 - b. At anchored end, provide double nuts with washer in between.
 - c. For Carbon Steel Non-High Strength threaded anchor rods 1-3/4-inch diameter or greater, provide ASTM A563 Grade A Heavy Hex nuts, and ASTM F436, Type 1 Circular Washer.
 - 3. Provide minimum embedment shown on the Drawings, favorably reviewed submittals, or a minimum of eight bolt diameters.

H. Post-Installed Mechanical Anchoring Systems:**1. General:**

- a. For mechanical anchors in concrete, submit ICC-ES or IAPMO evaluation report stating that the anchors are approved per ICC AC193 for use in cracked concrete to resist seismic loads in Seismic Design Categories A thru F.
- b. For mechanical expansion anchors in CMU, submit ICC-ES or IAPMO evaluation report stating that the anchors are approved per ICC AC01 for use in masonry elements to resist seismic loads in Seismic Design Categories A through F.
- c. For screw anchors in CMU, submit ICC-ES or IAPMO evaluation report stating that the anchors are approved per ICC AC106 for use in masonry elements to resist seismic loads in Seismic Design Categories A thru F.

2. Mechanical Undercut Anchoring Systems:

- a. Required for overhead applications.
- b. Anchor: Undercut anchor shall be of an undercut style with brazed tungsten carbides on the embedded end that perform the self-undercutting process.

(1) Carbon Steel Bolt and Sleeve:

- (a) Bolt: ISO 898, Class 8.8, SAE Grade 5, or ASTM A193 B7.
- (b) Sleeve: AISI 1045.
- (c) Nuts: ASTM A563 Grade A and meeting the dimensional requirements of ANSI B18.2.2.
- (d) Washers: SAE 1005-1033 or AISI 1040 and meeting the dimensional requirements of ANSI B18.2.2 Type A Plain.
- (e) Products: Hilti HDA-TF; DeWalt Atomic+ High Strength ASTM A193 B7 Undercut; or equal.

3. Mechanical Expansion Anchoring Systems:

- a. Anchor: Expansion anchor shall be pre-assembled expanding sleeve or wedge type with a single piece three section wedge. Anchors shall meet the description of Federal Specification A-A 1923A or A-A 1922A, Type 4. Anchor shall bear a length

identification code that is visible after installation. Provide hex head stud style unless flat or rod coupler styles are noted on Drawings.

b. Carbon Steel Anchors:

- (1) Anchor Body: ASTM A510 or AISI 1018 or AISI 12L14 or SAE J403.
- (2) Nuts: ASTM A563 Grade A and meeting the dimensional requirements of ANSI B18.2.2.
- (3) Washers: SAE 1005-1033 or ASTM F844 and meeting the dimensional requirements of ANSI B18.2.2 Type A Plain.
- (4) Products: Hilti Kwik Bolt TZ CS; Simpson Strong-Bolt 2 Carbon Steel; DeWalt Power-Stud+ SD1 and SD2; or equal.

4. Screw Anchoring Systems:

- a. Anchor: Concrete screws shall be self-tapping and heat treated. Screw anchors shall have complete contact with the base material and shall not require oversized holes for installation. Anchors shall bear a length identification code that is visible after installation.

b. Carbon Steel Anchors:

- (1) Anchor Body: $f_u \geq 81.6$ ksi
- (2) Products: Hilti KH-EZ; Simpson Titen HD Mechanically Galvanized; DeWalt Screw-Bolt+ Mechanically Galvanized; or equal.

c. Stainless Steel Anchors:

- (1) Anchor Body: $f_u \geq 125$ ksi
- (2) Products: Hilti HUS-HR SS 316 (ICC pending); Simpson Titen HD SS 316; or equal.

I. Post-Installed Injectable Adhesive Anchoring Systems in Concrete:

1. General: For application in contact with potable water provide NSF/ANSI STD 61 certified product.
2. Submit ICC-ES or IAPMO evaluation report stating that the anchors are approved per ICC AC308 for use in cracked concrete to resist seismic loads in Seismic Design Categories A thru F.

3. High Strength Epoxy Injectable Adhesive:
 - a. Adhesive: A two-component high-solids epoxy base resin and hardener material meeting the requirements of ASTM C881 Types I and IV, Grade 3, Class C. The adhesive shall be supplied in manufacturer's standard side-by-side cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer.
 - b. Products: Hilti HIT RE 100 (NSF 61), HIT-RE 500 v3 (NSF 61); Simpson SET-XP (NSF 61 216 in²/1000 gal); DeWalt Pure110+ (NSF 61), Pure50+, PE1000+; or equal.
4. Threaded Anchor Rods:
 - a. Chamfered edge of top end for ease of starting nut. Provide 45-degree chisel or cut point on embedded end.
- J. Post-Installed Injectable Adhesive Anchoring Systems in CMU:
 1. Submit ICC-ES or IAPMO evaluation report stating that the anchors are approved per ICC AC508 for use in masonry elements to resist seismic loads in Seismic Design Categories A thru F.
 2. Injectable Adhesive:
 - a. Adhesive: A two-component high-solids resin and hardener material. The adhesive shall be supplied in manufacturer's standard side-by-side cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer.
 - b. Products: Simpson SET-XP (NSF 61 216 in²/1000 gal), ET-HP, Hilti HIT-HY 200, HIT-HY270; Dewalt AC100+ Gold, or equal.
 3. Threaded Anchor Rods:
 - a. See Section 2.01.E.
 - b. Chamfered edge of top end for ease of starting nut. Provide 45-degree chisel or cut point on embedded end.

2.02 MISCELLANEOUS ITEMS

- A. Turnbuckles: ASTM F1145 and AISI C-1035.
- B. Eye Bolts and Eye Nuts: ASTM F541 and AISI C-1030.
- C. Clevises: AISI C-1035.
- D. Threaded Rods (Tie Rods): ASTM A36 or ASTM F1554 Grade 36 except as noted on Drawings.

- E. Insulating products for dissimilar materials:
 - 1. Galvanic Insulating Washers. NEMA LI 1 Glass Reinforced Epoxy G-10.
 - 2. Galvanic Insulating Sleeves. 1/32-inch thick, Mylar or Glass Reinforced Epoxy G-10.
- F. All metal fasteners not specified elsewhere.

2.03 NON-SHRINK GROUT

- A. ASTM C1107 with no shrinkage as measured by ASTM C827. Furnish a pre-mixed product consisting of properly proportioned amounts of non-metallic dimensionally stable material to which water is added.

PART 3 EXECUTION

3.01 ERECTION

- A. Structural Steel Work:
 - 1. Connections:
 - a. Provide anchor bolts and other connections between structural steel and foundations.
 - b. Set all anchor bolts by template, with provisions to hold bolts rigid and in correct position with respect to plan and elevation.
 - c. Install adhesive and expansion anchorages by personnel with satisfactory previous experience using the same products, following the manufacturer's recommendations and in compliance with the latest ICC-ES report.
 - d. Detail any undesigned connections in accordance with the AISC Specification.
 - e. Do not increase any hole diameter or slot length without the Engineer's approval.
 - f. Washers:
 - (1) Provide washers for slotted holes.
 - (2) Provide plate washer for long-slotted holes as noted on Drawings.
 - (3) Provide washers under the turned element for bolts installed with the Calibrated Wrench Pretensioning Method.

- (4) Provide washers for bolts installed with the Direct-Tension-Indicator Pretensioning Method.
 2. Install work anchored in sleeves set in concrete with non-metallic non-shrink grout. Allow a ¼-inch minimum clearance between items anchored and the sleeve.
 3. Where metal is fastened to concrete, make the connections by cast-in-place anchors or post-installed anchors as noted on Drawings.
 4. Post-installed anchors may not be substituted for cast-in-place anchors without Engineer's approval. For post-installed anchors proposed as a substitute, submit a Request for Deviation. Submit product data, evaluation reports, and anchorage calculations demonstrating equivalence, signed and stamped by a Civil or Structural Engineer licensed in the State in which the project is located, in accordance with Engineer's response to the Request for Deviation.
 5. Provide grout pads below base and bearing plates of non-shrinknon-metallic grout having a minimum thickness of ¾-inch unless otherwise noted. Do not bear directly on concrete slabs or equipment bases.
 6. Provide leveling nuts on anchor bolts, below base plates, and adjust prior to grouting.
 7. Where anchorage requires drilling into existing concrete, Contractor shall locate all reinforcing steel at least 14 days prior to drilling and shall notify Engineer of any conflicts immediately upon discovery. Contractor shall not drill through or cut any reinforcing steel without Engineer's approval.
- B. Post-Installed Mechanical Anchoring Systems:
1. Install mechanical anchors in accordance with the ICC-ES or IAPMO evaluation report for the specific anchor.
 2. Mechanical anchors may not be substituted for cast-in-place anchors or post-installed adhesive anchors without Engineer's approval. For mechanical anchors proposed as a substitute, submit a Request for Deviation. Submit product data, evaluation reports, and anchorage calculations demonstrating equivalence, signed and stamped by a Civil or Structural Engineer licensed in the State in which the project is located, in accordance with Engineer's response to the Request for Deviation.
 3. Where anchorage requires drilling into existing concrete, Contractor shall locate all reinforcing steel at least 14 days prior to drilling and shall notify Engineer of any conflicts immediately upon discovery. Contractor shall not drill through or cut any reinforcing steel without Engineer's approval.

4. Install adhesive anchors in accordance with the ICC-ES or IAPMO evaluation report for the specific anchor.
 5. Adhesive anchors are not allowed in overhead applications in general.
 6. Adhesive anchors may not be substituted for cast-in-place anchors or post-installed mechanical anchors without Engineer's approval. For adhesive anchors proposed as a substitute, submit a Request for Deviation. Submit product data, evaluation reports, and anchorage calculations demonstrating equivalence, signed and stamped by a Civil or Structural Engineer licensed in the State in which the project is located, in accordance with Engineer's response to the Request for Deviation.
 7. Where anchorage requires drilling into existing concrete, Contractor shall locate all reinforcing steel at least 14 days prior to drilling and shall notify Engineer of any conflicts immediately upon discovery. Contractor shall not drill through or cut any reinforcing steel without Engineer's approval.
- C. Repair and Modification of Connections and Anchorages: The Contractor shall pay for all necessary work and material, redesign work by the Engineer, and all additional tests and Special Inspections made on welds, bolts, and anchors required to repair or replace faulty work performed during the original fabrication and during erection.
- D. Repair of Galvanized Coating:
1. Repair surfaces damaged by cutting or welding by the heated repair method. Repair handrails or other surfaces that will not be painted and that are field welded or damaged by the heated galvanize repair method.
 2. Heat substrate to 600°F, or apply hot process touch-up material right after welding before metal has cooled below 600°F.
 3. Rub bar of specified galvanize repair material over surface of hot substrate to apply a uniform coating of zinc. Wire brush hot coating with a clean wire brush to smooth out and bond zinc coating to substrate to apply a uniform coating of zinc.

3.02 FIELD QUALITY CONTROL

- A. Post-Installed Mechanical and Adhesive Anchoring Systems:
1. Anchoring systems shall be installed in accordance with the ICC-ES or IAPMO evaluation report for the specific anchor. All anchors shall be tested and inspected in accordance with paragraph 1.04.C.
 2. Set torque-controlled expansion-type anchors to the recommended installation torque using a calibrated torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be

reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed or abandoned.

3. Set displacement-controlled expansion-type anchors to the recommended displacement. If the concrete cracks during installation of the anchor, the anchor shall be removed or abandoned.
 4. Anchors should exhibit no discernable movement during load testing.
 5. Holes drilled for anchors that do not set properly or fail in a tension test may not be reused, and shall be abandoned and filled with non-shrink grout. Notify the Engineer. Do not drill additional holes near abandoned drilled holes without the Engineer's approval.
 6. Where anchorage requires drilling into existing concrete, Contractor shall locate all reinforcing steel at least 14 days prior to drilling and shall notify Engineer of any conflicts immediately upon discovery. Contractor shall not drill through or cut any reinforcing steel without Engineer's approval.
- B. Erection Sequence: Verify each stage is completed before proceeding to the next.
- C. Tolerances: AISC Standard Practice.

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ARTICLE 36.01

GENERAL ELECTRICAL REQUIREMENTS

SECTION 36

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work Included:

1. Provide all required labor, project equipment and materials, tools, construction equipment, safety equipment, transportation, and test equipment, and satisfactorily complete all electrical work shown on the Drawings, included in these Specifications, or required for a complete and fully operating facility. In addition, provide wiring for the equipment that will be provided under other Divisions of these Specifications.
2. Auxiliary Devices: Provide conduit and wire for power and control for all auxiliary devices such as solenoid valves, pressure switches, and instruments that are included as part of a manufacturer's packaged system (i.e., all systems specified in Article 32). Contractor shall be responsible for conduit and wire to these auxiliary devices even if not specifically shown on the Drawings or specified herein.

B. Work Specified in Other Divisions:

1. Article 32.13: Fire Alarm System

C. Safety: Conduct operations in accordance with NFPA 70E, Standard for Electrical Safety Requirements for Employee Workspaces.

1.02 SUBMITTALS

A. Shop Drawings:

1. General: Submit Product Review or Product information shop drawings for materials and equipment as required under each Specification section.
2. For Product Review submittals, submit a single, complete submittal package for all items specified in a particular Specification section. Submittal packages shall be organized by equipment type. Include separators and tabs or other means of identifying each Specification paragraph (e.g., 2.01, 2.02, etc.) of the submittal.
3. All drawings shall computer generated utilizing AutoCAD Release 2012 computer aided drafting program. All drawings shall be prepared in a professional manner and shall include borders and completed title blocks. Provide copies of all CAD produced drawings on magnetic media satisfactory to the Owner in AutoCAD DWG format.

- B. As-Built Shop Drawings: Revise manufacturer's shop drawings to show any construction changes. Prior to final acceptance, deliver one complete set to the Engineer for his favorable review. After such review, provide copies of all CAD produced drawings on magnetic media satisfactory to the Engineer in AutoCAD DWG format.
1. Submit shop drawings (diagrams) for review in complete bound sets indexed by Specification number, with exterior tabs marked by subject. Submit manufacturer's catalog cuts for each item for which shop drawings are not required. Manufacturer's catalog cuts, specifications or data sheets shall be clearly marked to delineate the options or styles to be furnished. Show dimensions, physical configurations, methods of connecting equipment together, mounting details, and schematics. Drawings shall be complete with designations, equipment numbers, wire numbers and terminal board numbers. Submit fabrication details, nameplate legends, and internal wiring schematic drawings. Show all wire numbers, terminal numbers, spare wires and terminal blocks points. Include material lists and/or bills of material.
 2. Submit an elementary diagram for control, protection, and monitoring circuits. Elementary diagrams are not required for lighting, communications and those systems clearly defined on the single line diagram. Show all interconnections between power sources, apparatus, and device elements of a particular system or equipment, and all interlocks with other systems in a manner which fully indicates circuit function and operation. Refer to the Drawings for functional and operational requirements.
 3. For deferred shop drawings and product data such as the fire alarm control system, drawings shall be stamped by California registered Electrical Engineer or Fire Protection Engineer and shall include the requirements of Article 32.13
- C. Manuals:
1. Furnish Manuals for equipment where Manuals are specified in the equipment Specifications. Submit manuals in accordance with the requirements of Section 14.10 of the Special Provisions.
 2. In each manual, include equipment descriptions, record shop drawings, operation and maintenance instructions, parts ordering data and ratings for the equipment furnished for this project.
- D. Spare Parts: For each piece of equipment, submit a list of recommended spare parts. Include part numbers and the name, address, and telephone number of the supplier.
- E. All equipment provided under this Division shall be submitted.

1.03 QUALITY ASSURANCE

- A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the following applicable codes:
 - 1. NFPA 70, National Electrical Code (NEC), 2014 edition;
 - 2. National Electrical Safety Code (NESC), 2017 edition;
 - 3. Occupational Safety and Health Act (OSHA) standards;
 - 4. SCVWD Electrical Authority Having Jurisdiction: Standard Procedure for Safe Electrical Installations (IAHJ Program)
 - 5. California Fire Code Regulations, Part 9, Title 24
 - 6. NFPA 72 - National Fire Alarm Code, current version
 - 7. NFPA 90A - Installation of Air Conditioning and Ventilating Systems
 - 8. NFPA 101 - Life Safety Code, current version
 - 9. UL – Underwriters' Laboratories
 - 10. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, International Electrical Testing Association (ANSI/NETA-ATS), 2017 edition.
- B. Variances: In instances where two or more codes are at variance, the most restrictive requirements shall apply.
- C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA). The revisions of these standards in effect on the date of issuance of the Contract Documents shall apply.
- D. Underwriters Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the authority having code enforcement jurisdiction. Provide service entrance labels for all equipment required by the NEC to have such labels.
- E. Contractor's Expense: Obtain and pay for all required bonds, insurance, licenses, permits and inspections, and pay all taxes, fees and utility charges that will be required for the electrical construction work.
- F. Series short circuit ratings for protective devices are not allowed.

1.04 DRAWINGS

- A. Drawings: The Electrical Drawings are diagrammatic; exact locations of electrical products shall be verified in the field with the Engineer. Except where special details are used to illustrate the method of installation of a particular piece or type of equipment or material, the requirements or descriptions in this Specification shall take precedence in the event of conflict.
 - 1. Locations of equipment, inserts, anchors, motors, panels, pull boxes, manholes, conduits, stub-ups, fittings, lighting fixtures, power and convenience outlets, exterior lighting units and ground wells are approximate unless dimensioned; verify locations with the Engineer prior to installation. Field verify scaled dimensions on Drawings.
 - 2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for the installations.
 - 3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.
 - 4. Resolution of conflicting interpretations of the Contract Documents shall conform to Section 2.01 of Standard Provision.
- B. As-Built Drawings:
 - 1. Maintain a complete and accurate record set of Drawings for the electrical construction work.
 - 2. Record all work that is installed differently than shown on the Drawings.
 - 3. Upon completion of the work, transfer all marked changes to a clean set of full-size Drawings with red ink. Mark the Drawings "AS-BUILT DRAWINGS" and submit them to the Engineer when the electrical work is completed.
 - 4. Locate all underground conduits by accurate field-measured dimensions from walls and corners, etc., of surrounding structures.

1.05 TESTS

- A. The Contractor shall be responsible for factory and field tests indicated in Article 36.01, as required by the Engineer and as required by other authorities having jurisdiction.
- B. Furnish necessary testing equipment.

- C. Pay the costs of the tests, including replacement parts and labor due to damage resulting from damaged equipment or from testing and correction of a faulty installation.
- D. Reporting:
 - 1. Where test reporting is indicated, submit proof-of-design test reports for mass-produced equipment with the Shop Drawings.
 - 2. Submit factory performance test reports for custom-manufactured equipment for approval prior to shipment.
 - 3. Submit field test reports for review prior to Substantial Completion.
- E. Remove and replace equipment or material that fails a test, or, if the Engineer approves, repair and retest for compliance.
- F. Connections to equipment or materials with a factory warranty shall be as recommended by the manufacturer and shall be performed in a manner that does not void the warranty.

1.06 PERMITS AND INSPECTIONS

- A. Obtain all necessary permits and pay all fees required for permits inspections.
- B. The Engineer may inspect the fabricated equipment at the factory before shipment to job site. Provide the Engineer with sufficient prior notice so that an inspection can be arranged at the factory.
- C. Inspection of the equipment at the factory by the Engineer will be made after the manufacturer has performed satisfactory checks, adjustments, tests and operations.
- D. Favorable review of the equipment at the factory only allows the manufacturer to ship the equipment to the project site. The Contractor shall be responsible for the proper installation and satisfactory startup operation of the equipment to the satisfaction of the manufacturer and the Engineer.

1.07 DEMOLITION AND RELATED WORK

- A. General:
 - 1. Perform electrical demolition work as indicated.
 - 2. The Contractor is cautioned that demolition work may also be indicated on non-electrical Drawings.
 - 3. Coordinate with all trades regarding electrical de-energization, disconnection and removal, and the overall sequence of construction.

- B. Electrical Requirements for Removed Equipment:
 - 1. Remove dedicated wiring and exposed conduits back to the source.
 - 2. Abandon in place wiring that shares conduit with other equipment wiring, except power wiring.
 - 3. Remove power wiring from the power source to the first pullbox or manhole remote from the panel and abandon in place the remaining wiring.
 - 4. Abandon in place wiring routed through encased conduits and cut encased conduits flush to the floor and grout flush with the floor.
 - 5. Remove remote mounted starters, disconnect switches, circuit breakers, sensors and transmitters
- C. Junction Boxes:
 - 1. Wiring and conduits indicated to be extended shall be terminated in a new junction box with terminal strips.
 - 2. Provide a junction box with a NEMA rating in accordance with the area in which it is located and sized as required by the NEC.
 - 3. Properly identify wires and terminals before disconnection.
- D. Removed materials and equipment not indicated to be returned to the Owner shall, upon removal, become the Contractors property and shall be disposed of off-site.
- E. Remove and relocate material and equipment indicated to be relocated or reused and reinstall with care in order to prevent damage.
- F. Place materials indicated to be returned to the Owner in boxes, with the contents clearly marked, and store at a location determined by the Engineer.

1.08 COORDINATION

- A. Coordinate the electrical work with the other trades, code authorities, local Fire Marshal, and the Owner.
- B. The electrical contractor shall attend all project meetings associated with work specified in Article 36.
- C. When two trades join together in an area, make certain that no electrical work is omitted.

D. Field Verifications:

1. Visit the site before submitting a Bid to become better acquainted with the Work of this Contract.
2. The lack of knowledge will not be accepted as justification for extra compensation to perform the Work.
3. The Contractor shall be responsible for identifying available existing circuit breakers in lighting panel for the intended use as required.
4. The cost for the above field verifications shall be included as part of the Work.

1.09 EQUIPMENT COORDINATION

A. The Contractor is responsible to coordinate the equipment supplied from various manufacturers and vendors. This includes but is not limited to:

1. Obtaining specific information on equipment ratings and sizes and verifying the electrical components supplied meet, or match the requirements such as voltage, phase, frequency, starter types, etc.
2. Providing equipment that will fit within the space allocated and meet OSHA and NEC clearances.
3. Coordination of the supplied equipment's electrical power and control requirements.
4. Providing power and control equipment, wiring, and raceways to meet the requirements of the mechanical equipment supplied.
5. Providing all necessary control wiring and components for any special requirements from an equipment manufacturer.

B. The Contractor shall verify as a minimum:

1. Correct voltage, phase and frequency.
2. Size and space requirements.
3. Mounting requirements.
4. Proper coordination with the controls and fire suppression manufacturer.

C. Any discrepancies between the electrical equipment and other equipment shall be brought to the immediate attention of the Engineer and Owner.

D. The Contractor shall assure that no instrumentation or control interferences are created by the variable frequency drives (VFDs) or load wiring. The Contractor shall coordinate with the existing VFD manufacturer to provide necessary separation of conductors or shielding and/or filtering equipment as required by

the VFD manufacturer. If interferences do occur, the Contractor shall be responsible to take corrective action at no additional cost to the Owner.

1.10 ELECTRICAL NUMBERING SYSTEMS

- A. Tagging: All circuit raceways and armored cables shall be tagged at all terminations, panels, junction boxes, etc. in accordance with the assigned numbers developed with the Owner during the shop drawing review process. The tags shall be installed in a clean and high workmanship manner. In addition to tags at the terminations, exposed raceways and armored cables shall be tagged at each side of concealment.
- B. Prefix Modifiers: The following prefix modifiers shall be used when scheduling/tagging cables and raceway:

Raceway Prefix	Type of Function
P	Power
C	Control (120V)
S	Low level signal (less than 90-volt communication or less than 30-volt instrumentation).
D	Data
FA	Fire Alarm
PSP, CSP, SSP, DSP, FSP	Spare power, spare control, spare signal, spare data, spare fiber.

- C. Raceway Numbers:
- The circuit schedule identifies individual and discrete circuits necessary for the operation of their associated piece of equipment or element. Where multiple and similar control type circuits "C" and signal type "S" circuits only are listed going from one enclosure, panel, cabinet, etc. to another enclosure, panel, cabinet, etc. the contractor may combine like "S" circuit types and combine like "C" circuit types into a single "S" or "C" raceway or cable type; however, do not combine 24VDC or analog 4-20mA signal with 120VAC.
 - Where circuit/raceway numbers have not been assigned, Contractor shall assign raceway numbers in accordance with the following system.
 - Prefixes shall be followed by a process area code, multi-alpha numeric number defined by the equipment number or source panel, cabinet, MCC, etc. Where there is more than one raceway to a particular piece of equipment, a letter suffix is added to distinguish the raceways and cables.

Example: Raceway Number = P-xxxxA	
Where:	
P	= Raceway contains power wiring
-	= Delimiter
xxxx	= Sequential 3 or 4-digit number. The first digit shall be the same as the process area of the equipment being fed.
A	= Suffix letter to distinguish from other raceways and cables to same equipment

- D. Cable Numbers: Where cable numbers have not been assigned, Equipment Supplier shall assign cable numbers in accordance with the above system:
- E. Conductor Numbers:
1. Wire Markers: All control, fire alarm, and signal conductors in panels, pull boxes, power, instrument, and control cabinets, instrument cabinets, field cabinets, fire alarm control panels, fire alarm suppression control panel, and control stations, as well as connections to mechanical equipment, shall be tagged at each end with legible, coded tight fitting wire-marking sleeve showing the complete wire designation. The letters and numbers that identify each wire shall be machine printed on sleeves with permanent black ink. The figures shall be 1/8-inch high. Sleeves shall be yellow or white tubing, sized to fit the conductor insulation. The sleeves shall be shrunk to fit the conductor with hot air after installation. They shall be T&B, SHRINK-KON HVM or equal. Adhesive strips are not acceptable. Conductors size No. 10 AWG or smaller shall have identification sleeves. Conductors No. 8 AWG and larger shall use cable markers of the locking tab type. Tabs shall be white plastic with conductor identification number permanently embossed.
 2. Internal Wiring:
 - a. Wiring within a single enclosure shall be marked with the basic wire and terminal number at each end. The wire number shall designate the terminal or equipment number at each end of the wire separated by a slash.
 3. Field Wiring: All field wiring shall have wire labels at each end. The labels shall be marked with the output terminal number at the original equipment (control cabinet) and the remote device terminal # (if applicable) and tag name separated by a slash. Conductors shall be identified with numbers at both ends. Conductor tag numbers shall be the conductor number specified on the control diagram or if not shown, shall follow the convention below.
 - a. Wires from Fire Alarm Control Panels (FACP) shall be labeled with Panel Number (FACP001) – Terminal Number (12) (001-12).

Wires from PLC Processor panels (CCP) shall have Rack or Bus (1) – Card or Block (7) -Terminal number(A3) only (1-7-A3).

- b. Wires from devices, instruments etc. shall have the instrument or device name and terminal number if applicable. Equipment name is typically SYSTEM - DEVICE TYPE - NUMBER. (SNGHS011) (TSMPIX300) (INFLIX322).

1.11 JOB CONDITIONS

A. Operations:

1. Keep all power shutdown periods to a minimum.
2. Carry out shutdowns only after the schedule has been favorably reviewed by the Engineer.

B. Construction Power:

1. Make all arrangements for the required construction power.
2. When required, provide all equipment, materials and wiring in accordance with the applicable codes and regulations.
3. Upon completion of the project, remove all temporary construction power equipment, material and wiring from the site as the property of the Contractor.

- C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.12 DAMAGED PRODUCTS

- A. Notify the Engineer in writing in the event that any equipment or material is damaged.
- B. Obtain prior favorable review by the Engineer before making repairs to damaged products.

1.13 OPTIONAL EQUIPMENT

- A. For optional or substituted equipment, refer to Section 7.07 of the Standard Provision.

1.14 LOCATIONS

- A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located, as defined in Paragraph B. herein.

B. Definitions of Types of Locations:

1. Dry Locations: All those indoor areas which do not fall within the definitions below for Wet, Damp, Hazardous, or Corrosive Locations and which are not otherwise designated on the Drawings.
2. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.
3. Damp Locations: All spaces wholly or partially underground, or having a wall or ceiling forming part of a channel or tank, unless otherwise designated on the Drawings.
4. Corrosive Locations: Areas where chlorine or sulfur dioxide gas under pressure, liquid chlorine, sulfuric acid, or liquid polymer are stored or processed. These areas are shown on the Drawings.

C. Unless otherwise specified herein or shown on the Drawings, electrical enclosures and associated installations shall have the following ratings:

1. NEMA 1 gasketed or 12 for dry, non-process indoor above grade locations
2. NEMA 3R for outdoor installations identified not to be hazardous or corrosive.
3. NEMA 4X enclosures of Type 304 or 316 stainless steel in corrosive areas except in chlorine and HFS areas where non-metallic enclosures shall be provided.
4. NEMA 6 or 6P enclosures for submersible, indoor or outdoor use. Enclosures for temporary submersion shall be rated NEMA 6 and prolonged submersion shall be rated 6P at limited depth.
5. NEMA 7 enclosures (and listed for use in the area classifications shown) for "Class 1 Division 1 Group D" and "Class 1 Division 2 Group D" hazardous locations shown on the Drawings or as defined in NFPA 820 or other codes.
6. NEMA 9 enclosures (and listed for use in the area classifications shown) for "Class 1 Division 1 Groups E, F and G" and "Class 1 Division 2 Groups E, F and G" hazardous locations shown on the Drawings or as defined in NFPA 820 or other codes.

PART 2 PRODUCTS**2.01 STANDARD OF QUALITY**

- A. 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 favorably reviewed by the Engineer prior to installation.

- B. It is the intent of these Specifications and Drawings to secure high quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product. 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.
- C. 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.

2.02 WIRE MARKERS

- A. Wire and cable markers shall be "Omni Grip" as manufactured by the W.H. Brady Co., Thomas & Betts Co., 3M Co., or equal.
- B. Wire and cables with diameters exceeding the capacity of the "Omni Grip" shall be marked with preprinted, self-adhesive vinyl tapes as manufactured by the W.H. Brady Co., Panduit Corp., or equal.
- C. Printed using Brady marker "XC PLUS," or equal.
- D. Markers used in tunnels or other wet locations shall be on heat shrinkable marking sleeves.
- E. Use self-laminating vinyl on white background for markers within electrical equipment such as panels, termination cabinets, motor control centers

2.03 MULTICONDUCTOR CABLE AND RACEWAY TAGS

- A. Tags shall be:
 - 1. Manufactured of permanent metal or heavy mill plastic.
 - 2. Fastened to the raceways at both ends of the tag with permanent fasteners.
 - 3. Tag numbers shall be 1" tall and machine printed. Hand labeled tags are unacceptable.

2.04 NAMEPLATES

- A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings and the model designation.
- B. Equipment nameplates shall have both the equipment name and number.
- C. Nameplates shall be made of 1/16-inch thick machine engraved laminated phenolic having black letters not less than 3/16-inch high on white background or as shown on the drawings or other sections of the specifications. Nameplates on the interior of panels shall be White Polyester with printed thermal transfer lettering and permanent pressure sensitive acrylic; TYTON 822 or equal. All nameplates shall include the equipment name and number (and function, if applicable).
- D. Each control device, including pushbuttons, control switches, and indicating lights, shall have an integral legend plate or nameplate indicating the device function. These shall be inscribed as indicated on the Drawings or as favorably reviewed by the Engineer.
- E. Nameplates shall be secured to equipment with stainless steel screws/fasteners.

2.05 FASTENERS

- A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel. Provide stainless steel fasteners in Corrosive Locations. When fastening to existing walls, floors, and the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements. Minimum size capsule anchor bolt is 3/8-inch.

2.06 PAINTING

- A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Engineer.
- B. Wiring System: Coordinate the painting of all exposed conduits, boxes and fittings. Paint finishes shall include proper surface preparation, prime coat and a final finish coat, and shall conform to Article 36.

2.07 ENCLOSURES

- A. Unless otherwise noted, provide enclosures as follows:
 - 1. Dry Locations: NEMA Type 1
 - 2. Wet Locations: NEMA Type 4
 - 3. Damp Locations: NEMA Type 12
 - 4. Corrosive Locations: NEMA Type 4X (non-metal)

PART 3 EXECUTION**3.01 REQUIREMENTS**

- A. All electrical installations shall conform to the codes and standards outlined in this Section.

3.02 WORKMANSHIP

- A. Assign a qualified representative who shall supervise the electrical construction work from beginning to completion and final acceptance.
- B. Perform all labor using qualified craftsmen, 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 improperly fit installations at no additional expense to the Owner.

3.03 CONDUCTOR IDENTIFICATION

- A. Identify all wires and cables in conformance with the requirements of Articles 36.14 and 36.18. This requirement applies to all equipment provided under this contract, regardless of Division, as well as to all conductors provided or worked on during this contract.

3.04 INSTALLING EQUIPMENT

- A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.
- B. Install all floor-mounted equipment on 3-inch-high reinforced concrete pads. The Contractor, suppliers, and fabricators shall take this requirement into consideration when designing, fabricating, and installing panels, motor control centers, and other enclosures so that height above the floor of the operating handles of electrical devices meets the requirements of these Specifications and applicable codes.

3.05 CUTTING, DRILLING, AND WELDING

- A. Provide any cutting, drilling, and welding that is required for the electrical construction work.
- B. Structural members shall not be cut or drilled, except when favorably reviewed by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.
- C. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel.

- D. Perform patch work with the same materials as the surrounding area and finish to match, as specified in Article 36 of these Specifications.

3.06 METAL PANELS

- A. Mount all metal panels which are mounted on or abutting concrete walls in damp locations or any outside walls $\frac{1}{4}$ -inch from the wall and paint the back sides of the panels with a high build epoxy primer. Film thickness shall be 10 mils minimum.

3.07 FIELD TESTS

- A. Perform tests in accordance with applicable procedures as described in NETA Acceptance Testing Specifications.
- B. Give sufficient notice to the Engineer prior to any test to permit witnessing the test.
- C. Provide the services of a recognized independent testing laboratory and pay all costs of performing the inspections and tests as specified herein.
- D. The testing laboratory shall provide all materials, equipment, labor and technical supervision to perform such tests and inspections. It is the intent of these tests to ensure that all electrical equipment is operational within industry and manufacturer's tolerances and is installed in accordance with the Contract Documents and manufacturer's instructions. The tests and inspections shall determine the suitability for energization.
- E. The testing laboratory shall meet federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907. Membership in the International Electrical Testing Association (NETA) constitutes proof of meeting such criteria. The testing laboratory shall submit proof of these qualifications to the Engineer for review. Testing laboratory shall be Apparatus Unlimited, Electrical Testing and Controls, Electro- Test, Power Systems, or equal.
- F. The testing laboratory shall have a calibration program which maintains all applicable test instrumentation within rated accuracy. The accuracy shall be traceable to the National Bureau of Standards in an unbroken chain. Instruments shall be calibrated in accordance with the following frequency schedule:
 - 1. Field instruments: 6 months maximum
 - 2. Laboratory instruments: 12 months
 - 3. Leased specialty equipment: 12 months
 - 4. Date calibration labels shall be visible on all test equipment.
- G. Where testing pursuant to NETA requirements is required in these specifications, submit a test report which includes the following:
 - 1. Name of project, name of person performing test, and date of test.

2. Description of equipment tested.
 3. Description of test.
 4. List of test equipment used and calibration date.
 5. Test results.
 6. Conclusions and recommendations.
 7. Appendix, including appropriate test forms. The test report shall be bound, and its contents certified. Submit the completed report directly to the Engineer no later than thirty (30) days after completion of the test unless directed otherwise. Number of reports to be submitted for review shall be the same as the number required for shop drawing submittals.
- H. Safety practices shall include, but are not limited to, the following requirements:
1. Occupational Safety and Health Act of 1970, OSHA.
 2. Accident Prevention Manual for Industrial Operations, Seventh Edition, National Safety Council, Chapter 4.
 3. Applicable state and local safety operating procedures.
- I. All field tests shall be performed with apparatus de-energized except where otherwise specifically required by Section 8 of the latest Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems published by NETA. The testing laboratory shall have a designated safety representative who shall be present on the project and supervise operations with respect to safety. Circuits operating in excess of 600 volts between conductors shall have conductors shorted to ground by a hot-line grounded device approved for the purpose. In all cases, work shall not proceed until the safety representative has determined that it is safe to do so. The testing laboratory shall have available sufficient protective barriers and warning signs to conduct specified test safely.
- J. Electrical equipment and materials furnished and installed by the Contractor, and the testing equipment listed below shall be tested in accordance with the "Inspection and Test Procedures" and "System Function Tests" (Section 8) of the latest Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems published by NETA. Tests shall not include any tests listed as optional in the aforementioned NETA Specifications unless specifically noted in respective equipment specifications for this project.
- K. Retesting will be required for all unsatisfactory tests after the equipment or system has been repaired. Retest all related equipment and systems if required by the Engineer. Repair and retest equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

- L. Putting Equipment and Cables into Service: Submittal and favorable review of the specified factory and field tests shall occur before the Contractor is permitted to place the respective equipment or cable into service.
- M. Miscellaneous Tests:
 - 1. Insulation Resistance, Continuity, Rotation: Perform routine insulation resistance, continuity and rotation tests for all distribution and utilization equipment including all motors $\frac{1}{2}$ -horsepower and larger prior and in addition to tests performed by the testing laboratory specified herein. Supply a suitable and stable source of test power to the test laboratory at each test site. The testing laboratory shall specify requirements. Notify the testing laboratory when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling. All testing shall be performed in the presence of the Engineer. The testing laboratory shall be responsible for implementing all final settings and adjustments on protective devices and tap changes. Any system material or workmanship which is found defective on the basis of acceptance tests shall be reported directly to the Engineer. The testing laboratory shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report.
 - 2. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed, adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions and demonstrate satisfactory interfacing with the data acquisition and alarm systems.

3.08 EQUIPMENT PROTECTION

- A. Exercise care at all times after installation of equipment, motor control centers, etc., to keep out foreign matter, dust, dirt, debris, or moisture. Use protective sheet metal covers, canvas, heat lamps, etc., as needed to ensure equipment protection.

3.09 CLEANING EQUIPMENT

- A. Thoroughly clean all soiled surfaces of installed equipment and materials.
- B. Clean out and vacuum all construction debris from the bottom of all equipment.
- C. Provide and touch-up to original condition any factory painting that has been marred or scratched during shipment or installation, using paint furnished by the equipment manufacturer.

3.10 CLEANUP

- A. Upon completion of the electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Engineer.

ARTICLE 36.08

MISCELLANEOUS ELECTRICAL DEVICES

SECTION 36

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Article 36.01 become a part of this Section as if repeated herein.
- B. Work Included: Furnish and install all control devices complete, including, as applicable, enclosures, engraved escutcheons or nameplates, gaskets, lenses, lamps and mounting provisions.
- C. Related Work Specified Elsewhere:
 - 1. Article 32.13: Fire Alarm System

1.02 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association (NEMA) Publications:
 - 1. ICS1 General Standards for Industrial Controls and Systems
 - 2. ICS2 Standards for Industrial Control Devices, Controllers and Assemblies
 - 3. ICS6 Enclosures for Industrial Controls and Systems

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Review category of the General Conditions and the submittal requirements of Article 36.01.

PART 2 PRODUCTS

2.01 GENERAL

- A. All control devices shall conform to applicable provisions of NEMA Standards ICS1 and ICS2.

2.02 CONTROL AND TIMER RELAYS

- A. General: Relays shall be provided as necessary to perform switching functions required of control panels and other control circuits. Relays shall be of the following types (abbreviations in parentheses correspond to labels on the Drawings):

1. Size 0 Magnetic Contactors (MS): Provide Size 0 magnetic contactors for driving Size 4 and Size 5 ac operated motor starters. Provide Size 0 contactors of the same type and manufacture as the motor starter contactors.
2. Relays (CR):
 - a. Provide machine tool relays for the following applications:
 - (1) All relays driving 120 Vac motor starters up to and including Size 3.
 - (2) All relays driving non-motor loads up to 6 amps (or 720 VA).
 - b. Provide machine tool type relays with convertible contacts rated 10 amperes continuous with NEMA Rating Designation A600 for ac applications and N600 for dc applications. Coils shall be designed for continuous duty and shall have the voltage rating indicated on the Drawings.
 - c. Relays shall be the magnetically held type unless designated otherwise on the Drawings. For each relay provide one spare Form C contact over and above the number indicated on the Drawings. In addition, for latching relays, provide coil clearing contacts as necessary.
 - d. Manufacturer: General Electric CR120B; or equal.
3. General Purpose Control (CR) or (AR) Relays (plug-in):
 - a. Provide plug-in style 2-, 3-, or 4-pole enclosed relays with integral neon or LED indicators for the following applications:
 - (1) Relay logic (relays driving other relays, including machine tool relays) operating at voltages up to 120 Vac.
 - (2) Control power switching.
 - (3) All relays driving non-motor loads up to 2 amps (240 VA) at 120 Vac.
 - b. Provide relay sockets rated for 10 amp, 240 Vac with screw-type barriered terminals.
 - c. Manufacturer: Allen-Bradley Bulletin 700; or equal.

4. Analog or Digital Signal Switching (SR) Relays: Provide plug-in style indicating type relays with gold plated silver contacts for switching low level currents (less than 100 mA). Provide relay sockets screw-type barriered terminals.
5. Latching Relays (LR): Latching relay shall be general purpose plug-in relay, two- coil magnetically held with an integral neon or LED indicators. Relay contacts shall be rated for 10 amp, 240 volts with coil voltage as shown on the Drawings. Relay shall be complete with socket and shall be Idec RR2KP Series; or equal.
6. Timing Relays (TR) and (TD):
 - a. General: Relays designated TR shall be machine tool industrial relays, while those designated as TD shall be general purpose plug-in time delay relays.
 - b. Timing Relay (TR): Timing relay shall be machine tool industrial relay with solid-state timer and external adjustment dial. Range shall be 0 to 120 seconds unless indicated otherwise on the Drawings. Relay shall include an LED indicator and instantaneous and time-delay contacts rated at 10 amps, meeting NEMA A600 designation. Timing relay shall be "on delay" or "off delay" as indicated on the Drawings and shall be Allen Bradley Type RT-RTA; Square D; or equal.
 - c. Time Delay Relays (TD): Relay shall be solid-state with multi-range programmable settings. The relays shall include a calibrated front dial and LED indicator and shall be complete with socket. Relays shall be "on delay" or "off delay" type as indicated on the Drawings. Provide an additional form C contacts over and above the number indicated on the Drawings. Relay contacts shall be rated 10 amp, 120 Vac. Relays shall be ATC Type 328; Idec Type RTEL; or equal.
7. General Requirements:
 - a. Provide relays rated for 1 million operations at 10 amp, 120 Vac, at power factor of 0.2.
 - b. Where timing relays are interfaced to motor starters or adjustable speed motor controllers, provide auxiliary machine-tool relays or Size 0 magnetic contactors. Refer to previous specifications for machine-tool relays and Size 0 magnetic contactors.
 - c. Where timing relays or control relays require additional contacts, provide auxiliary control relays, properly sized for the application as described previously in this Section.

2.03 TERMINAL BLOCKS

- A. Terminal blocks shall be furnished and installed as required for "fan-out" of control, power, and instrumentation wiring in equipment. The blocks shall be rated 600V at a minimum of 20 amperes and sized for the conductors served. Provide terminal blocks with "follower" plates which compress the wires and have wire guide tangs for ease of maintenance. Terminal blocks which compress the wires with direct screw compression are unacceptable. All power, control and instrument wires entering and leaving a compartment shall terminate on terminal blocks with wire numbers on terminals and on both ends of the wires. Terminal blocks shall be similar to Phoenix type UK, Allen-Bradley, Buchanan, Entrelec, or equal.
- B. Numbers shall be assigned to all blocks except grounding blocks. Fuse blocks shall be assigned unique designations such as FU1, FU2. No two fuses shall be assigned the same designation. Fuse blocks shall be provided with nameplates showing the designation and identifying the current rating of the fuse.
- C. Terminal blocks shall be snap-in type for mounting on DIN EN mounting rails. End clamps and end cover plates shall be provided to hold terminal blocks securely in place. Provide single level terminal blocks only: stacked terminal blocks will not be allowed.
- D. Each terminal block shall have a unique identifying alphanumeric designation at one end (i.e.: TB1, TB2, etc.). On each terminal strip, terminal numbers shall be assigned starting with #1 at one end, incrementing in numerical sequence (i.e.: 1,2,3,4....). Plastic marking strip segments shall be provided to label terminal blocks. Each marking strip segment length shall provide labeling for no more than four terminals at one time. These marking strips shall have a unique number/letter for each terminal which is identical to the "elementary" and "loop" diagram wire designation. Numbers on this marking strip shall be machine printed and 1/8 inch high minimum.
- E. Terminal blocks shall be physically separated into groups by the level of signal and voltage served. Power and control wiring above 100 volts shall have a separate group of terminal blocks from terminal blocks for wiring below 100 volts, intermixing of these two types of wiring on the same group of terminal blocks is not allowed.
- F. Only single level terminal blocks shall be provided. No stacked terminal blocks will be allowed.
- G. Provide a separate common or neutral terminal for every input and output.

2.04 CONTROL PANEL ACCESSORIES

- A. Relays, timers and other internally mounted equipment shall be of the types specified in other sections of these Specifications.

- B. Panel face mounted equipment shall be of the types specified in other sections of these Specifications.
- C. Standards: All control devices shall conform to applicable provisions of NEMA Standards ICS 1 and ICS 2.
- D. Pushbuttons, Selector Switches and Pilot Lights:
 - 1. Shall be heavy-duty oiltight units; each unit shall have an engraved escutcheon plate unless nameplates are indicated on the Drawings or are necessary because of length of identification. Pushbuttons and selector switches shall have contacts rated 10 amperes continuous, Rating Designation A600 in conformance with NEMA ICS 2.
 - 2. Pushbuttons used as emergency stop devices shall have a padlockable means for maintaining an open circuit. Indicating lights shall be push-to-test transformer type with lenses of the colors shown on the Drawings.
- E. Multiposition control switches shall have rotary action, round knurled handle and the number of positions and stages shown on the Drawings. They shall be suitable for panel mounting. Each position shall have a positive detent. Contacts shall have a continuous current rating of 10 amperes at 300 Vac. Switches shall have integral indicator.
- F. For 4-20 mA_{dc} and 1 to 5 V_{dc} signal selector switches, provide oiltight selector switches with electronic duty gold contact blocks. Provide sliding contacts for reliable operation without benefit of thermal cleaning action.
- G. Panel Lights and Receptacles: Panels shall be internally lighted by LED lamps, provided with guards and a toggle switch located convenient to each access door. One duplex GFI type receptacle shall be provided in each panel section. The lights and receptacles shall be wired to outgoing terminal blocks for 120 volt, 60 Hertz, single phase supply.
- H. Nameplates: Unless specified otherwise in the Drawings, nameplates shall be black lamacoid with minimum 3/16-inch-high white letters for major area titles, 5/32-inch for component titles, and 1/8-inch for subtitles, and shall be fastened with a permanent but dissolvable adhesive or by screws.

2.05 CONTROL STATIONS

- A. Provide control stations complying with NEMA ICS 6 for manual control functions as follows and as shown on the Drawings: start-stop pushbutton, hand-off-auto, forward-reverse-jog-stop, etc. Control stations shall include selector switches, pushbuttons, and indicators as specified in this Section.
- B. Enclosures shall be as follows:
 - 1. Dry Locations: NEMA Type 12

- 2. Corrosive Locations: NEMA Type 4X
- 3. Wet Locations: NEMA Type 4X
- C. Nameplates: Provide an engraved plastic nameplate for each control station and escutcheons or nameplates for devices mounted thereon.
- D. Provide pushbuttons, selector switches, indicators, etc., as shown on the Drawings and as required. Provide control devices with NEMA ratings matching that of the control station.
- E. Manufacturer: Provide Allen-Bradley; Eaton; Square D; Crouse-Hinds; Killark or equal.

PART 3 EXECUTION**3.01 GENERAL**

- A. Identify all control devices with engraved plastic nameplates or escutcheons, as applicable. Install control devices as recommended by the manufacturer.

ARTICLE 36.09 ELECTRICAL GROUNDING

SECTION 36

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Article 36.01 become a part of this Section as if repeated herein.
- 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.

1.02 REFERENCE STANDARD

- 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 Fire Protection Association (NEPA):
 - 1. 70 National Electric Code (NEC)
- C. International Electrical Testing Association (NETA) Publication:
 - 1. ATS Acceptance Testing Specifications for Electrical Equipment for Power Systems

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Article 36.01.

PART 2 PRODUCTS

2.01 GENERAL

- 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.
- B. The Contractor shall coordinate with the equipment supplier to provide an equipment ground lug and contractor provided ground cable and terminations to bond the equipment to the grounding electrode system. Ground cable shall be sized in accordance with this specification. Use of conduit as a grounding connection is not acceptable.

2.02 SYSTEM COMPONENTS

- A. The System Ground Conductor shall be soft-drawn, bare annealed copper, concentric stranded, as specified. The minimum sizes shall be as follows, where American Wire Gage (AWG) conductor sizes are not shown or specified:
 - 1. Exposed metal cabinets: #2 AWG
 - 2. Electrical & Process equipment: #2 AWG
 - 3. Buildings and enclosure: #2 AWG
- B. 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.
- C. 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.
- D. Ground Connections:
 - 1. Connection to ground rods and buried connections shall be by exothermic weld.
 - a. Exothermic welding products shall be Erico's Cadweld Plus system with a remotely operated battery powered electronic ignition device and moisture resistant weld metal cup for the required mold, or equal.
 - 2. 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 #2/0 AWG.
 - 3. Connectors:
 - a. Bolted connectors shall be Burndy, O.Z. Gedney, Thomas and Betts, or equal.
- E. 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."
- 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.

PART 3 EXECUTION**3.01 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. Provide a ground rod box for each ground rod so as to permit ready access for the connection and/or removal of any pressure connectors to facilitate testing.
- C. Where ground rods must be driven to depths over 10 feet, increase rod diameter used, sufficiently to prevent the rod from bending or being damaged.
- D. 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.
- E. Provide a ground wire in every conduit carrying a circuit of over 150 volts to ground.

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ARTICLE 36.10 CONDUIT, BOXES, AND FITTINGS

SECTION 36

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Article 36.01 become a part of this Section as if repeated herein.

1.02 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI) Publications:
 - 1. C80.1 Specification for Zinc Coated Rigid Steel Conduit
 - 2. C80.3 Specifications for Zinc Coated Electrical Metallic Tubing
 - 3. C80.5 Specifications for Rigid Aluminum Conduit
- B. Federal Specifications (FS):
 - 1. FS W-C-1094 W-C-1094A Conduit and Conduit Fittings, Plastic, Rigid
 - 2. FS WW-C-540 WW-C-540A Conduit, Metal, Rigid, (Electrical, Aluminum)
WW-C-540C Conduit, Metal, Rigid and Coupling, Elbow and Nipple, Electrical Conduit, Aluminum
 - 3. FS WW-C-563 WW-C-563A Electrical Metallic Tubing
 - 4. FS WW-C-566 WW-C-566C Flexible Metal Conduit
 - 5. FS WW-C-581 WW-C-581E Intermediate Rigid Metal Conduit, Zinc Coated
 - 6. FS W-C-586 Conduit Outlet Boxes, Bodies and Entrance Caps, Electrical, Cast Metal
 - 7. FS W-J-800 Junction Box, Extension, Junction Box Cover, Junction Box (Steel, Cadmium or Zinc Coated)
- C. National Electrical Manufacturers Association (NEMA) Publications:
 - 1. RN 1 Polyvinyl Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
 - 2. TC 6 PVC and ABS Plastic Utilities Duct for Underground Installation
 - 3. TC 14 Filament-Wound Reinforced Thermosetting Resin Conduit

D. Underwriters Laboratories (UL) Standards:

1. 6 Rigid Metal Electrical Conduit
2. 360 Liquid-Tight Flexible Steel Electrical Conduit
3. 651 Electrical Rigid Nonmetallic Conduit
4. 651A Type EB and A Rigid PVC Conduit and HDPE Conduit
5. 797 Electrical Metallic Tubing
6. 1242 Intermediate Metal Conduit

E. ASTM International (ASTM) Publication:

1. A123 Specifications for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Article 36.01.
- B. Submittals shall include the following data, drawings, and description of materials.
1. Manufacturer and manufacturer's type and designations for each equipment item
 2. List of construction material for all conduits, fittings, supports and accessories
 3. The Contractor shall furnish copies of the manufacturer's certified test reports for the material being supplied to establish compliance with NEMA RN-1.

1.04 QUALITY ASSURANCE

- A. Performance and Design Requirements: The conduits and fittings shall be premium quality and suitable for installation in water facilities. The PVC coating on rigid galvanized steel conduit shall be made from virgin material.
- B. Inspection: All ducts shall be inspected by the Engineer prior to backfill. The Engineer shall inspect for drainage slope, spacers, conduit condition, and joints.
- C. All equipment furnished by the Contractor shall be listed by and bear the label of Underwriters' Laboratories, (UL) or of an independent testing laboratory acceptable to the Owner

1.05 LOCATIONS

- A. Refer to Article 36.01 for definitions of types of locations.

PART 2 PRODUCTS**2.01 CONDUIT, RACEWAYS****A. General:**

1. Rigid steel conduit (RSC) shall be used in all conduit systems, except where otherwise shown on the Drawings, where flexible conduit is required, or where these Specifications require, or allow the use of rigid steel conduit (RSC), electrical metallic tubing (EMT), flexible nonmetallic tubing (ENMT), polyvinyl chloride (PVC) conduit, intermediate metal conduit, or aluminum conduit.
2. Conduit runs concealed in or behind walls, above ceilings, or exposed on walls and ceilings 7 feet or more above finished floors and not subject to mechanical damage or corrosion may be EMT, or ENMT where permitted by the NEC.
3. The minimum size raceway shall be 3/4-inch unless indicated otherwise on the Drawings.

B. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication, conforming to ANSI C80.1 and UL 6. Couplings shall be threaded type.**C. Intermediate Metal Conduit (IMC) shall be steel, hot-dip galvanized after fabrication, conforming to UL 1242.****D. Flexible Conduit:**

1. Flexible metal conduit shall be liquid-tight, shall have a moisture- and oil-proof PVC jacket extruded over a galvanized, flexible steel conduit, and shall conform to UL 360.
2. Flexible conduit for hazardous locations shall be UL listed for the applicable Class, Division, and Group.

E. Rigid Nonmetallic Conduit: Rigid nonmetallic conduit shall be PVC Schedule 40 (PVC-40) conduit approved for underground use and for use with 90°C wires, and shall conform to UL 651.**F. Electrical Metallic Tubing (EMT) shall be galvanized thinwall conduit conforming to UL 797.****G. Electrical Nonmetallic Tubing (ENMT): Shall be UL listed rigid, hand bendable, corrugated non-metallic PVC tubing meeting NFPA 70 (NEC) Article 331 requirements.****H. Fiberglass conduit shall be filament-wound reinforced resin in accordance with NEMA TC-14.**

2.02 OUTLET, JUNCTION AND PULL BOXES

- A. Sheet Metal Boxes: Sheet metal boxes shall conform to UL 50, with a hot-dipped galvanized finish conforming to ASTM A123. Outlet boxes and switch boxes shall be designed for mounting flush wiring devices. Boxes and box extension rings shall be provided with knockouts. Boxes shall be formed in one piece from carbon-steel sheets. Outlet boxes shall not be less than 4 inches square and 1-1/2 inches deep. Ceiling boxes shall withstand a vertical force of 200 pounds for 5 minutes. Wall boxes shall withstand a vertical downward force of 50 pounds for 5 minutes. Gang-able and through-wall types are not acceptable. Boxes shall conform to FS W J 800D and UL 514.
- B. Cast Metal Boxes: Box bodies and cover shall be cast or malleable iron with a minimum wall thickness of 1/8-inch at every point, and not less than 1/4-inch at tapped holes for rigid conduit. Bosses are not acceptable. Mounting lugs shall be provided at the back or bottom corners of the body. Covers shall be secured to the box body with No. 6 or larger brass or bronze flathead screws. Boxes shall be provided with neoprene cover gaskets. Where only cast aluminum is available for certain types of fixture boxes, an epoxy finish shall be provided. Outlet boxes shall be of the FS types. Boxes shall conform to FS W C 586C and UL 514.
- C. Non-metallic Boxes: Non-metallic boxes shall be hot-compressed fiberglass, one-piece, molded with reinforcing of polyester material, with minimum wall thickness of 1/8-inch.
- D. Pull Boxes and Junction Boxes: Except where NEMA 4X fiberglass boxes are called for, all boxes shall be fabricated from carbon steel per UL 50. Boxes shall be welded construction with all seams or joints closed and reinforced. Boxes shall be galvanized after construction. Boxes intended for outdoor use shall be cast metal with threaded hubs and neoprene gasketed covers shall be of the fiberglass reinforced polyester type of 1/8-inch minimum thickness. Cover retention shall be by corrosion resistant stainless-steel screws.
 - 1. All boxes for wiring operating at 601 volts or higher shall be constructed without hinges and shall be padlockable.
 - 2. All boxes and cabinets shall be securely fastened to building structural members so as to prevent movement in any direction. Boxes shall not be supported by lighting fixtures, suspended ceiling support wires or freely hanging rods.
 - a. Covers of boxes and cabinets mounted in horizontal plane (top or bottom) shall either weigh not more than 40 pounds or shall require not more than 40 pounds of force to open or close.
 - b. Covers of boxes and cabinets mounted in vertical plane (front, back, sides) shall either weigh not more than 60 pounds or shall require not more than 60 pounds of force to open or close. All

covers over 30 pounds shall be furnished with angle support at bottom to carry weight of cover for assembly.

- c. Covers of boxes and cabinets weighing more than 30 pounds shall be provided with lifting handles or some means of grasping other than edges.

2.03 CONDUIT SUPPORTS

- A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.
- B. Supports for multiple conduits shall be hot-dip galvanized Unistrut or Superstrut channels, or equal. All associated hardware shall be hot-dip galvanized.
- C. All channels, strut, threaded rods, nuts and clamps in corrosive areas shall be of epoxy resin reinforced fiberglass material. Provide Robroy, Superstrut, or equal.

2.04 FITTINGS

- A. Fittings for use with rigid steel shall be hot dipped galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse-Hinds Condulets, Appleton Unilets, or equal. Provide threaded-type couplings and connectors; set-screw type and compression-type are not acceptable.
- B. Fittings for use with either rigid nonmetallic conduit or duct shall be PVC and have solvent-weld-type conduit connections.
- C. Fittings for flexible conduit shall be Appleton Type ST, O-Z Gedney Series 4Q, or equal.
- D. Union couplings for conduits shall be the Erickson type and shall be Appleton Type EC, O-Z Gedney 3-piece Series 4, or equal. Threadless couplings shall not be used.
- E. Bushings:
 - 1. Bushings shall be the insulated type.
 - 2. Bushings for rigid steel or IMC shall be hot dip galvanized insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or equal.
- F. Fittings for EMT shall be compression type. Connectors shall be insulated throat type. Drive-on, crimp, spring or set screw fittings are not acceptable.
- G. Fittings for ENMT shall be snap on-snap in types specially fabricated for ENMT.
- H. Fittings for use with fiberglass conduit shall be fiberglass and as recommended by the conduit manufacturer

2.05 WIREWAYS AND AUXILIARY GUTTERS

- A. General: Wireways shall consist of a prefabricated channel-shaped trough with hinged or removable covers, associated fittings, and supports. Straight sections shall not be longer than 5 feet. Cross-sectional dimensions shall be as indicated on the Drawings. Fittings shall consist of elbows, tees, crosses, and closing plates as required.
- B. Interior Locations: All components shall be constructed from sheet steel not less than 16 gauge and coated with a corrosion-resistant gray paint. Covers shall be held closed with screws.
- C. Exterior Locations: Wireway and associated fittings shall meet NEMA 3R/12 classifications, with gasketed closing end plates and gasketed hinged covers.
- D. Corrosive Locations: In corrosive locations provide enclosure type boxes for use as wireways. Enclosures and associated fittings shall meet NEMA 4X classifications and shall be manufactured from reinforced injection molded fiberglass or formed and welded stainless steel and shall have gasketed closing plates and hinged and gasketed covers with spring loaded latches.

2.06 SURFACE RACEWAY

- A. Surface metal raceways shall conform to the requirements of ANSI/NFPA 70 (the NEC) Article 352. Minimum cross-sectional area shall equal or exceed that of $\frac{3}{4}$ -inch conduit.

2.07 CONDUIT SEALANTS

- A. Moisture Barrier Types: Sealant shall be a non-toxic, non-shrink, non-hardening, putty type hand applied material providing an effective barrier under submerged conditions.
- B. Fire Retardant Types: Fire stop material shall be a reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL 1479. Provide products indicated by the manufacturer to be suitable for the type and size of penetration.

PART 3 EXECUTION**3.01 CONDUIT, RACEWAY AND FITTING INSTALLATION**

- A. From pull point to pull point, the sum of the angles of all of the bends and offsets shall not exceed 270 degrees.
- B. For power, control, fire alarm, and signal circuits, provide conduit per Conduit Use Tables below, unless specifically indicated otherwise on the Drawings:
 - 1. Exception: For raceways leaving a building above grade and then going below grade, provide PVC-coated GRS from a point 3 feet above grade to

a point 5 feet from the building wall.

- C. At all boxes and equipment, provide insulated type metallic grounding bushings for metallic conduits. Bond together all conduits to provide continuity of the equipment grounding system. Size bonding conductor per code.
- D. Provide flexible conduit in lengths of not more than 18 inches at connections to motors, valves and any equipment subject to vibration or relative movement. Flexible conduit connected to PVC coated conduit or boxes shall utilize PVC coated fittings.
- E. All conduits entering NEMA 3 and NEMA 4 enclosures, from any side, shall utilize a sealing hub, Meyers or equal.
- F. Provide galvanized rigid steel factory ells and offsets for both GRS and IMC raceways.
- G. Underground Raceways: Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the handhole located outside the building. For additional requirements see Article 36.10.
- H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits exposed except where the Drawings indicate that they are to be embedded in the floor slab, walls, or ceiling, or to be installed underground.
 - 1. Exposed Conduits:
 - a. Support exposed conduits within 1 foot of any outlet and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps. Coordinate conduit locations with piping, equipment, fixtures, and with structural and architectural elements. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel to building lines.
 - b. Group together exposed conduits in horizontal runs located away from walls and support on trapeze hangers. Arrange such conduits uniformly and neatly. Trapeze hangers shall consist of channels of adequate size, suspended by means of rods or other suitable means from the ceiling or from pipe hangers. Install such runs so as not to interfere with the operation of valves or any other equipment, and keep at least 6 inches clear of any pipe which may operate at more than 100°F. Treat cut surfaces or damaged ends with corrosion-resistant coatings such as "Devcon Z", prepared by Subox Coatings; "Galvanox Type I", prepared by

Pedley-Knowles; or equal. Application shall follow manufacturer's recommendation.

2. Conduits Embedded in Concrete: Provide concrete cover at least equal to that of the reinforcing steel, space at 3 conduit diameters apart except where they cross at angles greater than 45 degrees, and install so as not to reduce the structural integrity of the concrete element.
- I. When expansion joints are crossed, whether conduit is embedded or exposed, provide watertight expansion fittings and bonding jumpers. Provide Crouse-Hinds XD, Appleton, or equal.
- J. Spare Raceways: After completing a conduit run between manholes, handholes, or pullboxes, prove the integrity of the conduit run. Use an air compressor to blow in a pull-line, then use the pull-line to pull a mandrel through the entire conduit run. Install a new 3/16-inch nylon, 800-pound test pull-line which has tape measure marking every foot to indicate length. Plug the ends of the conduit, with conduit cap plugs.
- K. All penetrations through walls into or out of corrosive locations, as defined in Article 36.01 shall be made gas-tight. In concrete walls, pour concrete after the conduit is in place, if possible. If not, core drill concrete or CMU walls, install conduit and caulk around it with non-shrink grout. Install conduit seal in each conduit near the penetration. Provide moisture barrier type sealant.
- L. All conduit penetrations through interior walls and floors shall be sealed with fire retardant type conduit sealant.
- M. Conduit Identification: In each manhole, handhole, pullbox, cabinet, motor control center or other equipment enclosure, identify each conduit using the conduit number shown on the Drawings by means of a stamped brass tag affixed with stainless steel wire; where affixing a tag is not feasible, identify conduits by stenciling. Stencil all exposed conduits for identification at least once in each room.
- N. Conduit in finished areas shall be installed concealed.
- O. Conduit shall not be supported from T-bar ceiling suspension wires.
- P. Flexible metallic conduit shall have a maximum length of 6 feet. Flexible metallic conduit shall not be considered as a ground conductor. Flexible metallic conduit shall only be installed in exposed or accessible locations.
- Q. Rigid PVC conduit shall be stored on a flat surface and shielded from the sun.
- R. Cut EMT shall be reamed to remove all burrs.
- S. ENMT shall not be installed in hazardous areas, in concrete, or direct earth buried.

- T. Conduit used for power conductors on the load side of AFDs shall be RSC throughout.

TABLE 1
Conduit Use

Circuit Type	Inside Buildings						
	Exposed			Concealed			
	Standard	Corrosive	Hazardous	Above Suspended Ceilings	In Stud Walls	Embedded in Concrete	Slab on Grade
Power and 120 Vac Control	GRS	PVC-40* **	N/A	GRS	EMT	GRS	GRS
Signal	GRS	PVC Coated RSC	N/A	GRS	EMT	GRS	GRS

TABLE 2
Conduit Use

Circuit Type	Outside Buildings			Transition Within 5 Feet of Building
	Exposed	Buried in Soil	Duct Bank Encased in Concrete*	
Power and 120 Vac Control	GRS	PVC-40	PVC-40	PVC Coated GRS
Signal	GRS	PVC Coated GRS	GRS	PVC Coated GRS

* Provide ground wire sized per NEC requirements for all circuits.

** PVC coated GRS in wet wells, etc., that are both hazardous and corrosive, otherwise, GRS.

Notes:

- Generally, the Conduit Use Tables apply.
- Signal circuits are those subject to RF interference or induced current. MSPs, TSPs, telephone cable, coaxial cable, and manufacturer's cables specially designed for low level signals are all presumed to be part of signal circuits.
- Provide fiberglass conduit where indicated on the Drawings.

3.02 WIREWAY INSTALLATION

- Straight sections and fittings shall be solidly bolted together to be mechanically rigid and electrically continuous. Dead ends shall be closed. Unused conduit openings shall be plugged.
- Wireways shall be supported every 5 feet.
- Wireways and auxiliary gutters shall not contain wiring or control devices and shall not extend over 30 feet in length.

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ARTICLE 36.14
WIRES AND CABLES 600 VOLTS AND BELOW

SECTION 36

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provisions: Applicable provisions of Article 36.01 become a part of this Section as if repeated herein.

1.02 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM):
1. B3-74 Specification for Soft or Annealed Copper Wire
 2. B8-77 Specification for Concentric Lay Stranded Copper Conductors, Hard, Medium-Hard, or Soft
 3. B173-71 Specification for Rope Lay Stranded Copper Conductors Having Concentric Stranded Members
- B. Institute of Electrical and Electronic Engineers (IEEE):
1. 383 Shielded Instrumentation Cable, Specifications for
- C. Insulated Cable Engineers Association (ICEA):
1. S-66-524 Cross-Linked Thermosetting Polyethylene Insulated Wire and Cable
- D. International Electrical Testing Association (NETA);
1. ATS Acceptance Testing Specifications
- E. Underwriters Laboratories (UL) Standards:
1. 13 Power Limited Circuit Cable Class 2, Specifications for (Bulletin)
 2. 44 Rubber Insulated Wire and Cable
 3. 62 Flexible Cords and Fixture Wire
 4. 83 Thermoplastic-Insulated Wires and Cables
 5. 510 Insulating Tape
 6. 719 Non-Metallic Sheath Cable
 7. 1063 Stranded Conductors for Machine Tool Wire

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Article 36.01.

B. ACTION SUBMITTAL ITEMS FOR THIS SECTION:

1. A copy of this Section, addendum updates included, with each paragraph check- marked to indicate compliance or marked to indicate requested deviations from Section requirements.
2. Catalog cuts showing information of the conductors and cables to be supplied under this section.
3. Field test reports showing conductor and cable insulation resistance test results.
4. Provide engineering pull calculations for all 600V main feeders run underground outside building footprints.

1.04 LOCATIONS

- A. Refer to Article 36.01 for definitions of types of locations.

PART 2 PRODUCTS**2.01 CONDUCTORS**

- A. General: All conductors shall be copper unless specifically shown otherwise on the Drawings or in the circuit schedule. Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and in conformance with the applicable code. All insulated conductors shall be identified with printing colored to contrast with the insulation color.
- B. Power and Control Conductors, 600 Volts and Below:
1. Solid copper wires shall be 600 volt Type XHHW, sizes #12 and #10 AWG only.
 2. Stranded copper wire shall be 600 volt Type XHHW, Class B stranding, sizes #14 AWG and larger.
 3. Stranded copper wire shall be 600 volt Type XHHW or RHW, Class B stranding, Sizes #8 AWG and larger.
 4. Fixture wire shall be 600 volt, silicone rubber insulated, 200°C, UL Type SF-2, with stranded copper conductors
 5. Cords shall be 600 volt, 2-conductor plus ground, Type SO, hard service, of adequate length and with grounding type plug attached, rated in amperes as shown on the Drawings.
 6. Control cable (CC) shall be 90°C, 600 volt, UL listed multiconductor tray cable, Type TC. Individual conductors shall be #14 AWG, unless

otherwise noted. CC shall have 15 mils PVC insulation and 4 mils nylon over individual conductors; outer jacket shall be 45 mils thickness for up to 7 conductor cables and 60 mils for 9 through 19 conductor cables. Control cables shall be Dekoron Type IC99; Alpha Type TC; or equal.

2.02 SPLICES AND TERMINATIONS OF CONDUCTORS

A. Splices:

1. Wire and Cable Splicing Materials and Applications:

- a. For Lighting Systems and Power Outlets: Wire nuts shall be twist-on type insulated connectors utilizing an outer insulating cover and a means for connecting and holding the conductors firmly. They shall be UL listed and suitable for connecting two to four solid copper conductors of #14 or #12 AWG size or two or three #10 AWG solid copper conductors.
- b. All Equipment: Crimp type connectors shall be insulated type, suitable for the size and material of the wires and the number of wires to be spliced and for use with either solid or stranded conductors. They shall be UL listed.
- c. Division 36 Equipment and Power Conductors: Bolted pressure connectors shall be suitable for the size and material of the conductors to be spliced. They shall be UL listed and of the split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor.
- d. All Equipment: Epoxy splice kits shall include epoxy resin, hardener, and mold, and shall be suitable for use in wet locations and hazardous locations.

- 2. Terminal Cabinets: Provide terminal cabinets per Article 36.18. Termination system shall include insulated, crimp-type connectors. Coordinate the lug and boards for correct fit. All terminations shall include marker sleeves.

B. Terminations:

1. Low Voltage Terminations:

- a. Crimp type terminals shall be UL listed, self-insulating sleeve type, with ring or rectangular type tongue, suitable for the size and material of the wire to be terminated, and for use with either solid or stranded conductors.

- b. Terminal lugs shall be UL listed and of the split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor. Tongues shall have NEMA standard drilling.
 - c. Crimp with manufacturer recommended ratchet-type tool with calibrated dies. Hand crimping tools are not acceptable.
- C. Tape used for splices and terminations shall be compatible with the insulation and jacket of the cable and shall be of plastic material. Tape shall conform with UL 510.
- D. Wire markers shall plastic sleeve type. Wire numbers shall be permanently imprinted on the markers.

2.03 TWISTED SHIELDED PAIRS (TSP)

- A. Cable shall conform to IEEE 383, UL 13, and UL 83 and shall be type PLTC cable suitable for direct burial. Each TSP shall consist of two #16 AWG, 7 strand copper conductors per ASTM B8 with 15 mils PVC insulation. Conductors shall be twisted with 2-inch or shorter lay, with 100% foil shielding and tinned copper drain wires. Each pair shall have a 35-mil-thick outer jacket. Cable shall be rated at 90°C and for operation of 600 volts, as noted on the Drawings. Provide Alpha 5616B1601, Dekoron 1852 6860R, or equal.

2.04 MULTIPLE (TWISTED) SHIELDED PAIR (MSP) CABLES

- A. Each MSP cable shall conform to IEEE 383, UL 13, and UL 83 and shall consist of the number of pairs shown on the Drawings, of #20 AWG, 7 strand copper conductors per ASTM B8. Conductors shall have 15 mil PVC insulation and shall be twisted in 2 inch or shorter lay. Each pair shall have a 100% foil shield and a tinned copper drain wire. The MSP cable itself shall have, in addition, an overall foil shield, tinned copper drain wire, and an outer PVC jacket. Thickness of the jacket shall be 50 mils for 8 or fewer pairs, 60 mils for 10 to 16 pairs, and 70 mils for 18 or more pairs. Provide Alpha 5620B20XX, Dekoron 1874 XXX80, or equal.

2.05 TELEPHONE CABLE (TIC)

- A. Telephone cable shall consist of solid, soft bare copper. Conductors shall have a thermoplastic compound and shall be color coded per telephone industry standards. Insulated conductors shall be twisted into pairs having varying lengths of lay. This cable core shall be covered with a non-hygroscopic core tape and a 0.005-inch copper tape shield. Shield and tape shall be covered with a petrolatum-polyethylene compound for filling all cable interstices and providing a positive moisture barrier. Filling compound shall be non-toxic and shall not irritate the skin. Cable shall have an outer jacket of black, high molecular weight polyethylene jacket resistant to abrasion, moisture, weather and environmental cracking. Cable shall be suitable for installation in ducts or direct burial and shall be manufactured to REA Specification PE 39. Provide Alpha 3900 or 4000 Series; equivalent Brand-REX; or equal.

PART 3 EXECUTION

3.01 CONDUCTOR INSTALLATION

A. Provide the following types and sizes of conductors for the uses indicated for 600 volts or less:

1. Solid Copper, Sizes #12 and #10 AWG
2. Stranded Copper, Size #14 AWG and Larger, Individual Conductors or CC: As shown on the Drawings for the control of motors or other equipment. Size #14 shall not be used for power supplies to any equipment.
3. Stranded Copper, Sizes #8 AWG and Larger:
4. Fixture Wire: For connections to all fixtures in which the temperature may exceed the rating of branch circuit conductors.

B. Color Coding Table

System	Wire	Color
240/120 Volts Single-phase, three-wire	Neutral Line 1 Line 2	White Black Red
208Y/120 Volts Three-phase, four-wire	Neutral Phase A Phase B Phase C	White Black Red Blue
480Y/277 Volts Three-phase, four-wire	Neutral Phase A Phase B Phase C	White Brown Orange Yellow Green
Equipment Grounding Cables General Purpose AC Control Cables Discrete AC Cables at I/O Cards		Red Red
24V General Purpose DC Control Cables 24V Discrete DC Cables at I/O Cards 12V General Purpose DC Control Cables 12V Discrete DC Cables at I/O Cards		Blue / White w/ Blue Tracer Blue / White w/ Blue Tracer Pink w/ White Tracer / Black w/ White Tracer Blue / White w/ Blue Tracer Pink w/ White Tracer / Black w/ White Tracer
Instrumentation Cables including Shielded Pair Externally-Fed Control Cables (Interlocks)		Black/White Yellow

1. Use control cable or instrumentation cable for alarm annunciator field wiring as shown on the Drawings and specified. Use color coding and phasing consistent throughout the site. Bus bars at panelboards and motor control centers to be connected Phase A-B-C, top-to-bottom, or left- to-right facing connecting lugs.
 2. Conductors No. 2 AWG and smaller shall be factory color-coded with a separate color for each phase and neutral. Larger cables shall be coded by the use of colored tape.
 3. In addition to color coding, for all single-phase and three-phase systems, identify each cable (single or multi-conductor) and conductor at each end, in each manhole, pull box, cable tray, or other component of the raceway system. This identification is applicable to all power, control, alarm, signal, and instrumentation cables, and conductors.
 4. Identify each cable (single or multi-conductor) and groups or bundles of individual single conductors in each manhole, pull box, or other component of the raceway system with circuit identification markers. Implement a "from-to" cable/conductor bundle tagging system as part of this identification effort.
 5. Identify each individual conductor at each termination. This includes such locations as switchgear, switchboards, motor control centers, adjustable speed drives, control panels, junction/terminal boxes, all field devices, and all other locations where conductors are terminated. Identify the termination of these conductors in accordance with the accepted shop drawings. Tag conductors with sleeve-type labels.
 6. Where more than one nominal voltage system exists, identify each ungrounded system conductor by phase and system. Permanently attach means of identification at each branch-circuit panelboard, switchboard, switchgear, motor control center, or other type of power distribution equipment.
- C. Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.
- D. Wrap all cables in manholes with fireproofing tape. Extend tape 1-inch into ducts.
- E. Cable bending radius shall be per applicable code. Install feeder cables in one continuous length unless splices are favorably reviewed.

- F. Provide an equipment-grounding conductor, whether or not it is shown on the Drawings, in any flexible conduit or any raceway in which all or any portion of a run consists of non-metallic duct or conduit. For flexible conduit, an external bonding jumper is an acceptable alternative.
- G. In panels, bundle incoming wire and cables, No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.
- H. For cables crossing hinges, utilize extra flexible stranded wire, make up into groups not exceeding 12, and arrange so that they will be protected from chafing and excess flexing when the hinged member is moved.

3.02 CONDUCTOR SPLICES AND TERMINATIONS

- A. Splices: Install all conductors without splices unless necessary for installation, as determined by the Engineer. Splices, when permitted, and terminations shall be in accordance with the splice or termination kit manufacturer's instructions. Splice or terminate wire and cable as follows:
 - 1. Watertight Splices: Splices in concrete pullboxes, for any type of cable or wire, shall be watertight. Make splices in low voltage cables using epoxy resin splicing kits rated for application up to 600 volts.
- B. Terminations:
 - 1. Terminate stranded #14 wire using crimp type terminals where not terminated in a box lug type terminal. Terminals must be coordinated with type of terminal board where provided.
 - 2. Shields shall be handled as a separate conductor. Use manufacturer's compression sleeve and insulated pigtail. Keep pigtail as short as possible. Terminate pigtail with marker sleeve and tug.
 - 3. Crimp-type terminals shall be UL listed, self-insulating, sleeve type with ring or rectangular tongue, suitable for size and material of the wire to be terminated and for use with either stranded or solid wire. Spade type lugs are acceptable with telephone (TC) cable systems only.
 - 4. Crimp with manufacturer's recommended ratchet-type tool with calibrated dies. Hand crimping tools are not acceptable.

3.03 CABLE INSTALLATION

- A. Signal cable shall be installed by personnel who have a minimum of 3 years' experience in terminating and splicing twisted shielded conductors and co-axial cables.
- B. Adequate care shall be exercised by the installers to prevent cable damage or sheath distortion. Bending radius shall not be less than 10 times the cable O.D.
- C. Cables shall be continuous from initiation to termination without splices except where specifically indicated.
- D. Cable shielding shall be grounded at one end only of the cable. Bonding shall be to a single ground point only. Bonding from cable to cable in multiple run installations shall not be permitted.
- E. Heat shrinkable sleeving shall be installed on all cables to insulate shielding at the ungrounded cable terminations.
- F. Where installed in control consoles containing power circuits, cables shall be routed a minimum of 2 inches distant. Color coding shall be strictly observed throughout the installation.
- G. Manufacturer's cable pulling tension shall not be exceeded.

3.04 CONDUCTOR IDENTIFICATION

- A. Except for interior lighting and receptacle circuits, identify each wire or cable at each termination and in each pullbox, junction box, handhole, and manhole using numbered and lettered wire markers. All electrically common conductors shall have the same number. Each electrically different conductor shall be uniquely numbered. Identify panelboard circuits using the panelboard identification and circuit number. Identify motor control circuits using the equipment identification number assigned to the control unit by the motor control center manufacturer and the motor control unit terminal number. Identify other circuits as shown in the circuit schedule or as favorably reviewed by the Engineer.
- B. Conductor numbering shall be coordinated with the Interconnection Diagrams.
- C. Conductors between terminals of different numbers shall have both terminal numbers shown at each conductor end. The terminal number closest to the end of the wire shall be the same as the terminal number.

3.05 FIELD TESTS

- A. Insulation Resistance Tests: For all circuits 150 volts to ground or more and for all motor circuits over ½-horsepower, test cables per NETA Paragraph 8.3.1. The insulation resistance shall be 20 megohms or more. Submit results for review. See also Article 36.01.

- B. Phase Rotation: The phase rotation of all circuits shall be clockwise in sequence. The Contractor shall verify that each three-phase service, feeder and branch circuits meet this requirement. A record shall be kept at each circuit tested and, on completion, given to the Engineer for review.

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ARTICLE 36.18 WIRING DEVICES

SECTION 36

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Article 36.01 become a part of this Section as if repeated herein.
- B. Work Included:
 - 1. Installation, connection and furnishing all single, duplex, GFI and special purpose receptacles complete with wall plates and/or covers as shown on the Drawings.
 - 2. Installation, connection and furnishing of all single pole, three-way, pilot light and momentary position toggle switches complete with wall plates and or handle operators as shown on the Drawings.

1.02 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI) Publication:
 - 1. C73 Plugs and Receptacles
 - 2. C73a Plugs and Receptacles
- B. Federal Specifications (FS):
 - 1. W-C-596 D & E General Specifications for Cable Outlet Electrical Connector
 - 2. W-S-896 D & E General Specifications for Flush Mounted Toggle and Lock Switches
- C. National Electrical Manufacturers Association (NEMA) Publications:
 - 1. WD 1 General Requirements for Wiring Devices
 - 2. WD 6 Wiring Devices – Dimensional Requirements
- D. Underwriters Laboratories (UL) Standards:
 - 1. 20 General-Use Snap Switches
 - 2. 498 Electrical Attachment Plugs and Receptacles
 - 3. 514 Electrical Outlet Boxes
 - 4. 943 Class A Ground Fault Receptacle Interrupting Requirements

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Information category of the General Conditions and the submittal requirements of Article 36.01.

1.04 LOCATIONS

- A. Refer to Article 36.01, General Electrical Requirements, for definitions of types of locations.

PART 2 PRODUCTS**2.01 GENERAL**

- A. Wiring devices shall be UL approved for the current and voltage specified and shall comply with NEMA WD-1. Devices shall contain provisions for back wiring and side wiring with captive binding screws.
- B. Provide devices colored to conform to manufacturer's or industry standard for special use such as orange for isolated ground receptacles, blue for surge suppression receptacles, and red for emergency power receptacles. Unless shown otherwise on the Drawings or Schedules, normal use devices shall be brown, except those located in finished areas shall be ivory.

2.02 RECEPTACLES AND PLUGS

- A. General: Receptacles shall be heavy duty, high abuse, grounding type conforming to NEMA configurations, NEMA WD1 and UL 514 Standards.
- B. Single and Duplex Receptacles:
 - 1. Receptacles shall be of back and side wire design utilizing screw type terminals. Receptacles shall be rated 20 ampere, two-pole, 3-wire, 120-volt, NEMA 5-20 configuration, self-grounding. Color shall be brown in industrial areas and ivory or white in office and laboratory areas. Power contacts shall be a T-type design and shall be brass. Ground contacts shall be brass.
 - 2. Devices shall have a nylon composition face with a nylon or melamine body. Units shall comply with Federal Specification W-C-596E and meet UL 498 test requirements. Receptacles shall be Hubbell 5362, Leviton, Arrow-Hart; or equal.
- C. Special Purpose Receptacles: Receptacles shall be of the amperage, voltage and NEMA configuration indicated on the Drawing. Compliance to standards and tests shall be as listed in Item B above.

D. GFI Receptacles:

1. Device shall be rated 20-ampere, 2-pole, 3-wire, 120-volt, conforming to NEMA WD1.10 configuration. Face shall be nylon composition meeting UL 498 test standards. Unit shall have test and reset push buttons. Reset push button shall have a visible indicator band to indicated tripped condition.
2. GFCI component shall meet UL 498 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from 31°F to 158°F. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.
3. Provide Hubbell 5362, Leviton, Arrow-Hart, or equal.

2.03 SWITCHES

- A. Line Voltage Types: Switches shall be rated 20 amperes at 120 or 277 volts ac only. Units shall be flush mounted, self-grounding, quiet operating toggle devices. Handle color shall be brown in industrial areas and white or ivory in office and laboratory areas. Units shall conform to Federal Specifications W-S-896 D and E, UL 20, and NEMA WD1 standards. Sierra Electric, Monumental Grade, Catalog No. 5721, Leviton, or equal.
- B. Low Voltage Types: Switches shall meet all of the requirements listed in Item A above except to be rated at 15 amperes for switching 24 volts dc. Devices shall be three-position, momentary contact, spring return, center "off" configuration.

2.04 PLATES

- A. General: Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform with NEMA WD1, UL 514, and ANSI C73. Plates on shall be stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or cast metal having rounded corners and beveled edges.
- B. Stainless Steel: Plates shall be 0.035 inches thick with beveled edges and shall be manufactured from No. 302 alloy having a brushed or satin finish.
- C. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.
- D. Blank Plates: Cover plates for future telephone or television outlets shall match adjacent device wall plates in appearance.
- E. Damp or Wet and Corrosive Locations: Plates shall have weather protective double doors. Material of manufacture shall be die-cast aluminum for metallic

plates or nylon for non-metallic plates. Provide protective plastic bubble covers where receptacles are dedicated for equipment normally plugged in.

PART 3 EXECUTION**3.01 GENERAL**

- A. Boxes shall be independently supported by galvanized brackets, expansion bolts, toggle bolts, or machine or wood screws as appropriate. Wooden plugs inserted in masonry or concrete shall not be used as a base to secure boxes, nor shall welding or brazing be used for attachment.
- B. Receptacles and switches installed in sheet steel boxes shall be flush mounted. Flush mounted receptacles shall be located 18 inches above the floor unless otherwise indicated. Switch boxes shall be mounted 48 inches above the floor. Receptacles installed in cast device boxes shall be located 48 inches above the floor.
- C. Wiring devices shall be tested for correct connections.
- D. Damp or Wet Interior Locations: Install only wiring devices approved for outdoor service. Adjust boxes so that front edge will be 1/4-inch beyond the rear edge of the finished wall. Use metal tubing sleeves to bring device mounting straps flush with the front edge of the finished wall.
- E. Receptacles:
 - 1. Receptacles shall be grounded by a grounding conductor, not by a yoke or screw contact.
 - 2. Receptacles shall be oriented so that the grounding slot is located at the top of the outlet.
- F. Receptacles shall be installed with connections pigtailed (spliced) to the branch circuit wiring so that removal of the receptacle will not lose neutral continuity and branch circuit power will not be lost to other receptacles on the same circuit.

3.02 INSTALLATION OF WALL PLATES

- A. General: Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.
- B. Interior Dry Locations: Install plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversize plates or sectional plates.
- C. Exterior and/or Wet Locations: Install plates with gaskets on wiring devices in such a manner as to provide a raintight weatherproof installation. Cover type shall match box type.

- D. Future Locations: Install blanking cover plates on all unused outlets

3.03 TESTS

A. Receptacles:

1. Receptacles shall be tested for blade and ground plug tension prior to installation. Do not install any receptacle having less than 16 ounce individual blade retention.
2. After installation of receptacles, circuits shall be energized and each receptacle tested for proper ground continuity, reversed polarity, and/or open neutral condition.
3. GFI receptacles shall be tested with the circuits energized. Devices shall be tested with a portable GFI receptacle tester capable of circulating 7.5 milliamperes of current, when plugged in, between the "hot" line and "ground" to produce tripping of the receptacle. Resetting and tripping shall be checked at least twice at each GFI receptacle

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ARTICLE 36.34

LOW VOLTAGE CIRCUIT BREAKERS

SECTION 36

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provisions: Applicable provisions of Article 36.01 become a part of this Article as if repeated herein.
- B. Work Included: Provide all necessary labor, tools and material to install circuit protective devices as shown on the Drawings and as described in these Specifications.

1.02 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI) Publication:
 - 1. Z55.1 Gray Finishes for Industrial Apparatus and Equipment
- B. National Electrical Manufacturers Association (NEMA) Publications:
 - 1. ICS 3 Industrial Systems
 - 2. ICS 6 Enclosures for Industrial Controls and Systems
 - 3. 250 Type 1 Enclosures for Electrical Equipment (1,000 Volts Maximum)
- C. Federal Specifications (FS):
 - 1. W-C-375 Circuit Breakers, Molded Case, Branch Circuit and Series Service, Series Trip
 - 2. W-F-1726 Class H Cartridge Fuses
- D. Underwriters Laboratories (UL) Standards:
 - 1. 50 Electrical Cabinets and Boxes
 - 2. 198C Fuses, High-Interrupting-Capacity-Current Limiting Types
 - 3. 489 Molded Case Circuit Breakers and Enclosures
 - 4. 698 Industrial Control Equipment for Use in Hazardous (Classified) Locations
 - 5. 894 Switches for Use in Hazardous (Classified) Locations
- E. National Fire Protection Association (NFPA) Publication:
 - 1. 70 National Electric Code

1.03 SUBMITTALS

- A. Submit material or equipment data in accordance with the Product Review category of the General Conditions and the submittal requirements of Article 36.01.

1.04 QUALITY ASSURANCE

- A. Performance Requirements
 - 1. The frame sizes for overcurrent protective devices shall be as indicated on the contract drawings. The overcurrent protective devices shall be either thermal magnetic or fully magnetic depending on whether the device is protecting a feeder or a motor starter.
 - 2. The main circuit breakers at the motor control centers shall be of the frame sizes indicated and have adjustable trip settings.
 - 3. Molded case circuit breakers shall be provided with current ratings and pole combinations as indicated on the contract drawings.
 - 4. The molded case circuit breakers for protecting feeders shall be thermal magnetic type that provides inversed time delay overload and instantaneous short circuit protection. The molded case circuit breakers in combination type starters shall be fully magnetic type that provides instantaneous short circuit protection. In addition, the circuit breakers shall be ambient temperature compensated. The minimum interrupting rating of the breakers shall be at least equal to the available short circuit current at the line terminal.
- B. Operating Requirements: The circuit breakers shall be of the same manufacturer as the existing panelboards. The voltage, number of poles, frame size and ampere rating shall be per the drawings.

1.05 LOCATIONS

- A. Refer to Article 36.01 for definitions of types of locations.

PART 2 PRODUCTS**2.01 FUSIBLE SWITCHES**

- A. Fusible switches shall be heavy-duty safety switches with the voltage ratings, current ratings, and number of poles as indicated by the Drawings. The switches shall be horsepower rated. Auxiliary contacts shall be provided as indicated on the Drawings. Stationary contacts shall be equipped with arc chutes. Fuse clips shall accept only Class J current limiting cartridge fuses. Where indicated on the Drawings, units shall have service entrance labels and shall be equipped with an

insulated neutral lug. Switches shall be Square D, Type HD; Eaton Type H600; or equal.

B. Enclosures shall be as follows:

1. Dry Locations: NEMA Type 1.
2. Corrosive Locations: NEMA Type 4X.
3. Wet locations: NEMA Type 4.

C. Nameplates: Provide an engraved plastic nameplate for each disconnect switch identifying the equipment it protects.

D. Fuses:

1. General: Provide one complete set of fuses of each ampere rating shown on the Drawings plus one spare set for each size shown.
2. Fuse Type: Units shall be Class J current limiting, 700-volt, in the ampere ratings shown. Plug fuses are unacceptable. Barrels shall be non-hygroscopic with brass knurled ferrules.
3. Fuses shall conform to FS W-F-1726 and UL 198B, and shall carry labels showing UL class, interrupting rating, time delay characteristics, and voltage rating.

2.02 ENCLOSED CIRCUIT BREAKERS

A. Units shall be thermal-magnetic molded case circuit breakers in surface mounted non-ventilated enclosures conforming to the appropriate articles of NEMA 250, as follows:

1. Indoor, Dry, Clean Locations: NEMA Type 1.
2. Outdoor, Unprotected Locations: NEMA Type 3R/12.
3. Wet Locations: NEMA Type 4.
4. Corrosive Locations: NEMA Type 4X.

B. Each unit shall have an external operating handle with a cover interlocking mechanism which will prevent opening of the enclosure when the operating handle is in the "ON" position. The handle shall be capable of being padlocked in either the "ON" or the "OFF" position. A breaker "tripped" position shall be clearly indicated between the "ON" and the "OFF" position.

C. Where indicated on the Drawings, enclosed breakers used as service entrance equipment shall be so labeled for such service and shall contain an insulated neutral lug. The complete unit shall conform to UL 489.

D. The circuit breakers shall be of the voltage, number of poles, frame size and ampere rating shown on the Drawings. Units shall be manually operated, trip-free, thermal- magnetic, molded case, front mounted circuit breakers.

1. Frame sizes larger than 100 amperes shall have adjustable instantaneous magnetic elements. Minimum interrupting rating shall not be less than 10,000 amps asymmetrical and the breaker shall conform to FS W-C-375. Multiple breakers shall have a common trip single operating handle with three positions of indication. Circuit breaker shall be calibrated at 40°C (104°F).
2. Each breaker shall be completely enclosed in a molded case with the calibrated sensing element factory sealed to prevent tampering.

2.03 DISCONNECT SWITCHES

- A. Disconnect switches shall be heavy-duty safety switches with the voltage ratings, current ratings, and number of poles as indicated by the Drawings. The switches shall be 600-volt type and horsepower rated. Auxiliary contacts shall be provided as indicated on the Drawings. Switches shall be Square D Type HD; Cutler-Hammer HUN Series; or equal.
- B. Enclosures shall be as follows:
 1. Dry Locations: NEMA Type 1.
 2. Corrosive Locations: NEMA Type 4X.
 3. Hazardous Locations (gases): NEMA Type 7.
 4. Hazardous Locations (dusts): NEMA Type 9.
 5. Wet Locations: NEMA Type 4X.
- C. Nameplates: Provide an engraved plastic nameplate for each disconnect switch identifying the motorized equipment it controls.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install units plumb within 1/8-inch of vertical, and in accordance with manufacturer's instructions. Make sure fuse ratings are as shown on the Drawings, and that breaker trip settings are per the Engineer's instructions.

3.02 MOUNTING HEIGHTS

- A. Fusible switches and enclosed circuit breakers shall be centered 5 feet-0-inch above the floor.

3.03 FIELD TESTS

- A. Insulation Resistance Tests: Perform insulation resistance tests on circuits to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests after all equipment has been connected, except that equipment which may be damaged by the test voltage shall not be connected. Test the insulation with a

500 Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 20 megohms or more. Submit results for review.

- B. Continuity Tests: Perform circuit continuity tests from a low powered dc test source to operate a buzzer or bell. Tests shall be made prior to energizing the protected circuit.
- C. Operating Tests: Demonstrate that the protected circuit can be manually controlled by the installed equipment.

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ARTICLE 36.38 LIGHTING

SECTION 36

PART 1 GENERAL

1.01 SUMMARY

- A. Scope: This section specifies luminaries (lighting fixtures) features and installation.
- B. Specifications Referenced:
 - 1. 36.01: General Electrical Requirements
 - 2. 36.10: Conduits, Boxes, and Fittings
 - 3. 36.14: Wires and Cables 600 Volts and Below
- C. Definitions: Terminology used in this Section conforms to the following definitions:
 - 1. Lighting terminology used herein is defined in IES RP-16.

1.02 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section insofar as specified and modified herein. In the event of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

Reference	Title
NFPA 70	National Electrical Code (NEC)
IESNA LM 79	Electrical and Photometric Measurements of Solid- State Lighting Products
IESNA LM 80	Measuring Lumen Maintenance of LED Light Sources

- B. Warranty: Provide a Warranty for LED luminaires. The Warranty shall include as a minimum the following:
 - 1. A written 5-year warrant on lamp replacement material, fixture finish and workmanship. Finish warranty shall include warranty against failure or substantial deterioration such as blistering, cracking, peeling, chalking or fading.
 - 2. A written 5-year replacement material warranty for defective or non-starting LED source assemblies.
 - 3. A written 5-year replacement material warranty on all power supply units (PSU).

4. The warranty period shall begin on the date of Substantial Completion. The Contractor shall provide the Owner with appropriate signed warranty certificates. The Owner shall have received these certificates prior to final payment.

1.03 SUBMITTALS

- A. Procedures: Article 36.01.
- B. Action Submittal Items for this Section:
 1. A copy of this Section, addendum updates included, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations from Section requirements.
 2. Manufacturer's descriptive catalog literature for all fixtures and accessories being installed under this section. Information shall include manufacturer, wattage, voltage, mounting configuration, and lamp type. Catalog cuts shall be edited to show only the items, model numbers, and information which apply.
 3. Catalog information describing fixture make, materials, and dimensions.

PART 2 PRODUCTS

2.01 GENERAL

- A. Unless otherwise specified, lighting materials, including fixtures, accessories, and hardware, shall conform to the detailed requirements specified on the Drawings. Lighting fixtures shall be provided where specified on the drawings. The drawing's light fixture placement is diagrammatical in nature. The actual installation and fixture layout shall be coordinated with the various trades and equipment.

2.02 LED LUMINAIRES (LED)

- A. LED luminaires shall be a complete functioning unit with all components including light source, lamps, power supply, control interface and any additional components needed for operation shall be assembled by the luminaire manufacturer.
- B. Luminaires shall comply with ANSI chromaticity standard for classifications of color temperature. Luminaire shall be UL or ETL listed and labeled.
- C. Luminaire testing shall be per IESNA LM-79 AND LM-80 procedures.

- D. Useful Life Requirements: The useful life of the luminaire in terms of lumen output must be specified by one of the following two methods:
 - 1. Simplified L70 threshold: A minimum of 50,000 operating hours before reaching the L70 lumen output degradation point, accounting for individual LED lumen depreciation and catastrophic failures. Fifty percent of the sample population must reach the 50,000-hour point – this is known as B50. Only 10 percent of the LED lamps can have failed in a conventional sense – this is known as F10.
- E. Provide shop drawings showing illumination levels with LED systems based on lumen output at 70 percent lumen depreciation for white LEDs and 50 percent for colored LEDs. Initial lumen output for all LEDs shall be listed individually.
- F. LED Drivers:
 - 1. Drivers shall have reversed polarity protection, open circuit protection and require no minimum load.
 - 2. Drivers shall operate at a minimum 85 percent efficiency and have a class A noise rating.
 - 3. LED driver shall be solid state unit mounted within fixture and shall be adequately ventilated and match the LED fixture rating in watts and voltage.
- G. Where LED systems are required to be dimmable, the LED system shall be capable of full and continuous dimming.

2.03 EXIT SIGNS

- A. UL listed. Provide with automatic power failure device, test switch, pilot light, and fully automatic high/low trickle charger in a self-contained power pack. Battery shall be sealed electrolyte type, shall operate unattended, and require no maintenance, including no additional water, for a period of not less than 5 years. LED exit sign shall have emergency run time of 1-1/2 hours (minimum). The light emitting diodes shall have rated lamp life of 70,000 hours (minimum).

PART 3 EXECUTION

3.01 GENERAL

- A. The location and type of fixtures are shown on the drawings. Lighting circuit raceways and conductors shall be sized by the contractor. Raceways and wire shall be provided from the fixtures and switches to the lighting panel in accordance with the NEC. Raceways shall be provided in accordance with Article 36.10. Wire shall be provided in accordance with Article 36.14.

- B. Fixtures labeled to require conductors with a temperature rating exceeding 75 degrees C shall be spliced to circuit conductors in a separately mounted junction box. Fixture shall be connected to junction box using flexible conduit with a temperature rating equal to that of the fixture.
- C. Labels and marks, except the UL label, shall be removed from exposed parts of the fixtures. Fixtures shall be cleaned when the project is ready for acceptance.
- D. Fixtures shall be aligned and directed to illuminate an area as specified. Fixtures shall be directly and rigidly mounted on their supporting structures. Unless otherwise specified, conduit system shall not be used to support fixtures. Where brackets or supports for lighting fixtures are welded to steel members, the welded area shall be treated with rust-resistant primer and finish paint.
- E. All fixtures and luminaires shall be clean, and lamps shall be operable at the time of acceptance.
- F. Align, mount, and level the luminaires uniformly.
- G. Avoid interference with and provide clearance for equipment. Where an indicated position conflicts with equipment locations, change the location of the luminaire by the minimum distance necessary.
- H. Luminaire supports shall be anchored to the structural slab or structural members as recommended by the manufacturer. Supports shall maintain the luminaire positions after relamping and cleaning.
- I. Surface mounted fixtures shall be rigidly bracketed from mounting surfaces. Nipples carrying wiring between luminaires shall be watertight.
- J. Battery Operated Emergency Lighting Fixtures:
 - 1. Wall-mounted at designated height per manufacturer's instructions.
 - 2. Battery disconnect switch to be left in the "off" position until building power is fully operational.

APPENDIX A

Agreement

Payment Bond

Performance Bond

Escrow Agreement for Security Deposits in Lieu of Retention

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The following is an agreement entered into as of _____ by and between the SANTA CLARA VALLEY WATER DISTRICT, State of California, hereinafter referred to as "District" and _____, hereinafter referred to as "Contractor."

For the considerations hereinafter specified, Contractor and District agree as follows:

ARTICLE I: Work to Be Done and Documents Forming the Contract

Contractor agrees to do all the work and furnish all materials necessary to construct and complete, in accordance with the Specifications the following work:

Pacheco Pumping Plant Priority 1 Fire Alarm and Suppression System Improvements

Project No 91214010-9120, Contract No. C0653

Said work shall be performed to the satisfaction of the Engineer all in accordance with the Drawings, Specifications, Notice to Bidders, and the Proposal of the Contractor, all of which documents are hereby specially referred to and by such reference made a part of this Contract.

ARTICLE II: Contract Price

District hereby agrees and promises to pay to Contractor the sum of _____ Dollars (\$_____).

For the performance of said work; provided, however, that the above mentioned sum is one determined by the Proposal of Contractor as based upon the estimated amount of work to be done, and should there be any variance between the estimated amount of work to be done and the actual amount of work performed, then the final payment price shall be computed on the basis of the unit prices contained in the Proposal of Contractor.

ARTICLE III: Completion of Contract

It is hereby agreed that the work called for under this Contract, in all its parts and requirements, shall be completed before the expiration of **250** calendar days from the First Chargeable Day of the Contract as stated on the Notice to Begin Work unless the time for completion is extended, as allowed by the Specifications.

ARTICLE IV: Bonds Required

This Contract shall have no force or effect whatsoever unless and until Contractor delivers to District a Payment Bond in the sum of _____ Dollars (\$_____).

Nor shall such Contract be effective until Contractor also gives a good and sufficient bond in the sum of _____ Dollars (\$_____) for the faithful performance of the work to be done under the terms of this Contract.

ARTICLE V: Certification by Contractor

Contractor hereby certifies as follows:

"I certify that I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract."

ARTICLE VI: Gift Policy Observance

Contractor hereby acknowledges that District policy prohibits the acceptance by District personnel of gifts of any kind from vendors or contractors. Contractor shall honor this policy by not sending or bringing gifts to the District.

IN WITNESS WHEREOF, Contractor and District have caused this Agreement to be subscribed as of the day and year first hereinabove written.

Date Contractor signature affixed:

By

Title

Federal I.D.

"Contractor"

SANTA CLARA VALLEY WATER DISTRICT

Date District signature affixed:

By

Chair/Board of Directors

BE IT KNOWN BY THESE PRESENTS:

WHEREAS, the Santa Clara Valley Water District (hereinafter called "the Public Entity"), and _____ (hereinafter designated as "Principal") have entered into an agreement for the **PACHECO PUMPING PLANT PRIORITY 1 FIRE ALARM AND SUPPRESSION SYSTEM IMPROVEMENTS** which said agreement is dated as of _____, 20____; and

WHEREAS, said Principal is required by California Civil Code Sections 9550 and 9554 to furnish a bond in connection with said agreement;

NOW, THEREFORE, we, the Principal and _____, a corporation duly organized under the laws of the State of _____, having its principal place of business at _____ in the State of _____, and authorized to do business in the State of California, hereinafter "Surety," are held and firmly bound unto the Public Entity 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, and successors and assigns, jointly and severally, firmly by these presents.

1. THE CONDITION OF THIS OBLIGATION IS SUCH that if the Principal or the Principal's subcontractor fails to pay any of the persons named in Section 9100, or amounts due under the California Unemployment Insurance Code with respect to work or labor performed under the agreement, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal and the Principal's subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, that the Surety or Sureties will pay for the same, in an amount not exceeding the sum hereinabove specified, and also, in case suit is brought upon the bond, a reasonable attorney's fee, to be fixed by the court. The Principal may require of the Principal's subcontractors a bond to indemnify the Principal for any loss sustained by the Principal because of any default by the Principal's subcontractors under Section 9554 of the California Civil Code.
2. This bond shall inure to the benefit of any of the persons named in Section 9100 of the California Civil Code, so as to give a right of action to such persons or their assigns in any suit brought upon this bond.
3. Surety, for value received, hereby 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 to the Contract Documents accompanying the same 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 or to the work or to the other portions of the Contract Documents.
4. Should the condition of this bond be fully performed, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.



IN WITNESS WHEREOF two identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety or Sureties above named on the _____ day of _____, 20_____.

PRINCIPAL:**SURETY:**

Signature

Signature

Name

Name

(Seal)

Title

Title

Address

Address

NOTE: Signature of those executing for Surety must be properly acknowledged.

BE IT KNOWN BY THESE PRESENTS: That

WHEREAS, the Santa Clara Valley Water District, State of California, has awarded to

____ (hereinafter designated as "Principal") a Contract for **PACHECO PUMPING PLANT
PRIORITY 1 FIRE ALARM AND SUPPRESSION SYSTEM IMPROVEMENTS**, and

WHEREAS, said Principal is required under the terms of said Contract to furnish a bond for the faithful performance of said Contract,

NOW, THEREFORE, we, the Principal and _____
as Surety, are held and firmly bound unto the Santa Clara Valley Water District (hereinafter called "District") in the sum of _____ Dollars (\$_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the above bounden Principal, or heirs, executors, administrators, successors, or assigns shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the said Contract and any alteration thereof made as therein provided, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless District, its officers, agents, and employees, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

And the said 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 Specifications accompanying the same shall in any wise affect its obligation on this bond, and does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the Specifications.

In the event suit is brought upon this bond by District and judgment is recovered, Surety shall pay all costs incurred by District in such suit, including a reasonable attorney's fee to be fixed by the Court.



IN WITNESS WHEREOF two identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by Principal and Surety above named, on the _____ day of _____, 20_____.

PRINCIPAL:

SURETY:

Signature

Signature

Name

Name (Seal)

Title

Title

Address

Address

NOTE: Signature of those executing for Surety must be properly acknowledged.



CONTRACT DOCUMENTS
**Escrow Agreement for Security
Deposits in Lieu of Retention**
Page 1 of 3

Escrow Account No.: _____

This Escrow Agreement is made and entered into by and between:

SANTA CLARA VALLEY WATER DISTRICT whose address is 5750 Almaden Expressway,
San Jose, CA 95118 hereinafter called "**Owner,**" and

_____ whose address is _____ hereinafter called
"**Contractor,**" and

_____ whose address is _____ hereinafter called
"**Escrow Agent,**" and

For the consideration hereinafter set forth, the Owner, Contractor, and Escrow Agent agree as follows:

1. Pursuant to §22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to the Construction Contract entered into between the Owner and Contractor for **PACHECO PUMPING PLANT PRIORITY 1 FIRE ALARM AND SUPPRESSION SYSTEM IMPROVEMENTS** in the amount of \$ _____ dated (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the Owner shall make payments of the retention earnings directly to the Escrow Agent. When the Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the Owner within 10 days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between the Owner and Contractor. Securities shall be held in the name of **Santa Clara Valley Water District** and shall designate the Contractor as the beneficial owner.
2. The Owner shall make progress payments to the Contractor for those funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.
3. When the Owner makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until the time that the escrow created under this contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the Escrow Agent directly.
4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the Owner. These expenses and payment terms shall be determined by the Owner, Contractor, and Escrow Agent.

-
5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.
 6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from the Owner to the Escrow Agent that Owner consents to the withdrawal of the amount sought to be withdrawn by Contractor.
 7. The Owner shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven days' written notice to the Escrow Agent from the owner of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the Owner.
 8. Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.
 9. Escrow Agent shall rely on the written notifications from the Owner and the Contractor pursuant to Sections (5) to (8), inclusive, of this Agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.
 10. The names of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:
 11. Throughout the term of this Escrow Agreement, the Escrow Agent herein agrees to provide monthly statements indicating the account balances and status of the account, directly to the Owner, the Santa Clara Valley Water District, at the address provided below, to the attention of the District's representative identified below. The Escrow Agent may submit a request to provide such statements in electronic format.
 12. The Escrow Agent must provide written notice to the Owner in advance of any action that will negatively impact the account.



CONTRACT DOCUMENTS
**Escrow Agreement for Security
Deposits in Lieu of Retention**

Page 3 of 3

On behalf of Owner:

Signature Date

Name
*Capital Program Deputy Operating Officer
Designated Engineer*

Title

*5750 Almaden Expressway
San Jose, CA 95118*

Address

On behalf of Contractor:

Signature Date

Name

Title

Address

On behalf of Escrow Agent:

Signature Date

Name

Title

Address

At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

OWNER:

Signature Date

Name
*Capital Program Deputy Operating Officer
Designated Engineer*

Title

*5750 Almaden Expressway
San Jose, CA 95118*

Address

CONTRACTOR:

Signature Date

Name

Title

Address

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APPENDIX B

Notice of Exemption

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Public Notice
Notice of Exemption



To: Merced County Clerk
Clerks Office, Business Division
2222 M Street,
Merced, CA 95340

From: Santa Clara Valley Water District
5750 Almaden Expressway
San Jose CA 95118-3686
Telephone (408) 265-2600

Project Title: Pacheco Pumping Plant: Priority 1 Fire Alarm and Suppression System Improvements

Project Location-Specific: Dinosaur Point Road, located off HWY 152 (Attachment 1)

Project Location-County: Merced County

Project Purpose: The proposed project would increase fire suppression capability at the Pacheco Pumping Plant, as shown in Attachment 1: Project Area Map.

Name of Public Agency Approving Project: Santa Clara Valley Water District

Name of Agency or Person Carrying Out Project: Santa Clara Valley Water District

Exempt Status: (check one)

- ☐ Ministerial [Sec. 21080(b)(1); 15268];
- ☐ Declared Emergency [Sec. 21080(b)(3); 15269(a)];
- ☐ Emergency Project [Sec. 21080(b)(c)];
- ☒ Categorical Exemptions [Section 15301; Class 1, "Existing Facilities"]
- ☐ Statutory Exemptions [State code number].

Reasons Why Project is Exempt: The project qualifies for a Categorical Exemption under California Environmental Quality Act (CEQA) Guidelines §15301 (Class 1). None of the conditions noted under CEQA Guidelines §15300.2 will occur.

"Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The types of "existing facilities" itemized below are not intended to be all-inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of an existing use."

Description of Project: The proposed project would consist of installation of a clean agent fire suppression system, a new standpipe connection, and a new fire alarm system at the Pacheco Pumping Plant (Plant). Work would be timed to coincide with reduced operations and most of the proposed work would occur inside the Plant. Minor excavation may be necessary to install the standpipe connection; if required, excavation would begin after April 1 and conclude prior to November 1. Materials and equipment would be staged onsite.

Lead Agency: Santa Clara Valley Water District
Contact Person: Colin Ganong

Area Code/Telephone/Extension
(408) 630-2847

Signature: Katherine Owen

Date: 10/22/2018

Title: Katherine Owen
Deputy Operating Officer

cc: CEQA Administrative Record

Attachment 1: Project Area Map



San Felipe Division – Pacheco Pumping Plant

Priority 1 Fire Alarm and Suppression System Improvements
Context Map



Santa Clara Valley
Water District



Main Map Center Lat., Long.: 37.0618, -121.1805

Date Saved: 9/18/2018 12:08:47 PM

Path: \\SRVFILE1\workgroups\Resource Pro\PROJECTS BY FACILITY POST-2012\Pipelines & Pump Plants\Pacheco Pump Plant\Fire Suppression System Improvements\Planner\GIS\SFD_PPP_Priority1_ContextMap.mxd

Service Layer Credits: Sources: Esri, DeLorme, USGS, NPS

APPENDIX C

Guidelines for Contractor's As-Built Mark-Ups or Engineer's Record Drawings

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Guidelines for Contractor's As-Built Mark-Ups or Engineer's Record Drawings

Santa Clara Valley Water District
CADD Services Unit

Version: 1.1 Effective Date: December 2009	Document Number CADD G101

EXTERNAL USERS:

The version provided by the “District” represents the applicable version.

INTERNAL “DISTRICT” STAFF:

Printed or downloaded versions are for reference only. See the CADD Services Unit website for released version.

Guidelines for Contractor’s As-Built Mark-Ups or Engineer’s Record Drawings

CADD Services Unit

These guidelines were developed and written by Emmanuel Aryee (CADD Services unit) and the example figures were provided by Roberto Parmituan (Construction Inspection unit). They were then reviewed by the Plans and Specifications Standardization team.

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1.0 REDLINE MARKING IN THE FIELD OR THE OFFICE

Redline mark ups should be neat, legible, clear, and orderly and should accurately record and reflect the actual as-built condition.

It should be done with the correct symbols, lines, lettering and text, details, dimensioning, etc. using red pencil or ink.

All construction changes are based on authorized change documents or Engineer's instructions. These documents are kept in the Project or Construction files.

Change documents include addendum, request for information (RFI), contract change order (CCO), engineers work order or extra work order (EWO), field memo, etc. See Figure 4 & 6. It is not acceptable to attach change documents to the drawings to avoid having to mark up changes on the drawings. Changes should be interpreted and then transferred by redline markings on to the drawing sheets; they should be referred to in the listing of the changes or revisions in the title block of the drawing sheet. See Figure 4 to 8.

Already drafted changes, sketches, diagrams of the changes (not the complete change document) may be attached on blank spaces on the drawing sheet or a separate blank sheet, (not to cover the original drawing information) to show or illustrate the extent of the changes, if that will be helpful.

Features, items, details that were changed should be clearly detailed, dimensioned, located (survey information, tying to control lines, other features or monuments, station offsets or reference lengths, distances, etc.) and described in detail with lines, lettering & text, etc. with redline mark up.

Redline mark ups should be done in a manner that enables any competent technician or drafter to draft the as-built mark-up or the record drawings with minimum difficulty.

Redline marking includes making changes, additions and/or deletions representing the actual construction changes for the as-built drawings or changes authorized by the engineer on the record drawings.

1.1 CHANGE

A change is made when an item(s) on the drawing sheet is modified or replaced with completely new item(s). It may involve the change of a simple line, dimension, note or re-sketch of a part or a component. Only those areas of a drawing that are affected should be marked up. Item(s) changed should be clouded.

Clouding—The use of a cloud to surround the area or item, text or symbol changed so as to make the changes stand out and be easily identified. The original content that is not affected by the change is left unclouded. See Figure 8.

1.2 ADDITIONS

Additions occur when new item(s) are introduced on to the drawing sheet to supplement or clarify information without modifying or replacing the original items. When additions are made to the drawings that affect only the drawing content, the additions should also be clouded since they are revisions to the original drawings.

1.3 DELETIONS

Deletions occur when features, details or items on the drawings are not constructed, are removed, are changed and/or replaced.

When preparing As-built drawings, all original drawing details, items are preserved. Deleted items should not be erased or removed from the marked up drawing. Deletions are shown by **crossing** out the deleted elements, details, lines, text, symbols, or any other items involved, with one of these methods;

- a slanted/horizontal line (strike-out line) across the element,
- a heavy “X” over the element,
- a bold, big X across a major element or across the entire drawing sheet.

The area or item affected should be clouded to indicate the limits of removal. See Figure 8.

2.0 ADDITIONAL SHEETS

When changes involve the incorporation of new additional sheet or sheets, it may or may not be necessary to do clouding on the original sheet. If there is a reference to a new sheet in the set, then the reference area should be clearly clouded and the call out to the additional sheet made. Otherwise the new drawing should be marked as normal but tracking notation should show that this is an additional sheet with the original sheet left intact.

In cases where the marking up of several changes on the same sheet leaves the drawing content unclear, crowded, or when features and items become unidentifiable or make the drawing unreadable, use of additional sheets should be considered.

3.0 TRACKING OF “AS-BUILT” CHANGES OR REVISIONS

All changes marked up must be tracked. They must be clearly identified with the triangle symbol with the revision number (used in the change document) or the letters “AB” embedded (if no revision numbers are used). The triangle symbol should be placed by the side of all changes, outside the cloud, on the affected drawing sheet.



Figure 1—As-Built (AB) Triangle Symbol

A subscript representing the number (#) assigned to track and identify the particular change or revision is placed by the triangle symbol as shown above in Figure 1.

4.0 LISTING OR RECORDING OF CHANGES OR REVISIONS

All changes that have been done since the final (construction) drawings were issued must be listed or recorded on the Contractor's "As-Built" drawing sheets and/or the Engineer's record drawings.

Changes made during construction must be listed or recorded and identified under the revision section of the title block of the drawing sheet. Each listing should be identified with the corresponding number (subscript) of the triangle symbol. The listing consist of a short description of the change and an abbreviated name of the change document such as CCO #2 for contract change order number 2, placed in brackets, under the "DESCRIPTION" heading.

It could also be "as per the Engineer instructions" for some of the changes done under the direct instructions of the Engineer. It must include a date and the initials of the person who authorized the change. See Figure 2.

REV	DESCRIPTION	DATE	APPR.
	1. REMOVE AND REPLACE EXISTING PIPE SYSTEM (LOC #1)	08/01	S.C.
	2. REVISE ANODE LEAD WIRE (CCO #2)	05/02	D.M.

Figure 2—Listing or Recording of Changes

5.0 SIGNING OF THE AS-BUILT OR THE RECORD DRAWINGS

Each sheet must be signed and dated by the contractor's representative for the contractor's as-built mark-ups. The representative must also include his/her printed name and his/her company's name. Similarly the Engineer must do the same for the record drawings. See sample below.

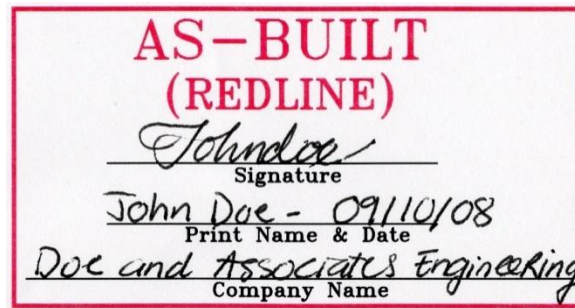


Figure 3—Sample of As-Built Signature Stamp

REQUEST FOR INFORMATION
FC 825 (04-10-86)

To: John Doe
(Resident Inspector)

Date: Feb. 6, 2008

From: R. B. Construction Co., Inc.
(Contractor, Utility, etc.)

Contractor File No.: 001

Contract: PWTP Landscaping

RFI Consec. No.: 4

Contract No.: C0526

Reply Needed By: Feb. 12, 2008

Item No.	INFORMATION ACTION NEEDED	Ref.Spec/Plan No.
1.	An existing buried concrete block was discovered during the trench excavation for the irrigation mainline. Location is shown in the attached drawing.	PLAN SHEET I-4
	This buried concrete block will not allow for the installation of the proposed irrigation mainline in the location shown. Please provide direction on how to proceed.	

Figure 4—Request for Information

ENGINEER'S RESPONSE

Santa Clara Valley Water District 

REQUEST FOR INFORMATION
FC 925 (04-10-86)

To: John Doe (Resident Inspector) Date: Feb. 6, 2008

From: R. B. Construction Co., Inc. (Contractor, Utility, etc.) Contractor File No.: 001

Contract: PWTP Landscaping RFI Consec. No.: 4

Contract No.: C0526 Reply Needed By: Feb. 12, 2008

Item No.	INFORMATION ACTION NEEDED	Ref. Spec/Plan No.
1.	An existing buried concrete block was discovered during the trench excavation for the irrigation mainline. Location is shown in the attached drawing.	PLANSHEET I-4
	This buried concrete block will not allow for the installation of the proposed irrigation mainline in the location shown. Please provide direction on how to proceed.	

DISTRIBUTION: Pink = retained by Initiator 3 copies to Resident Inspector

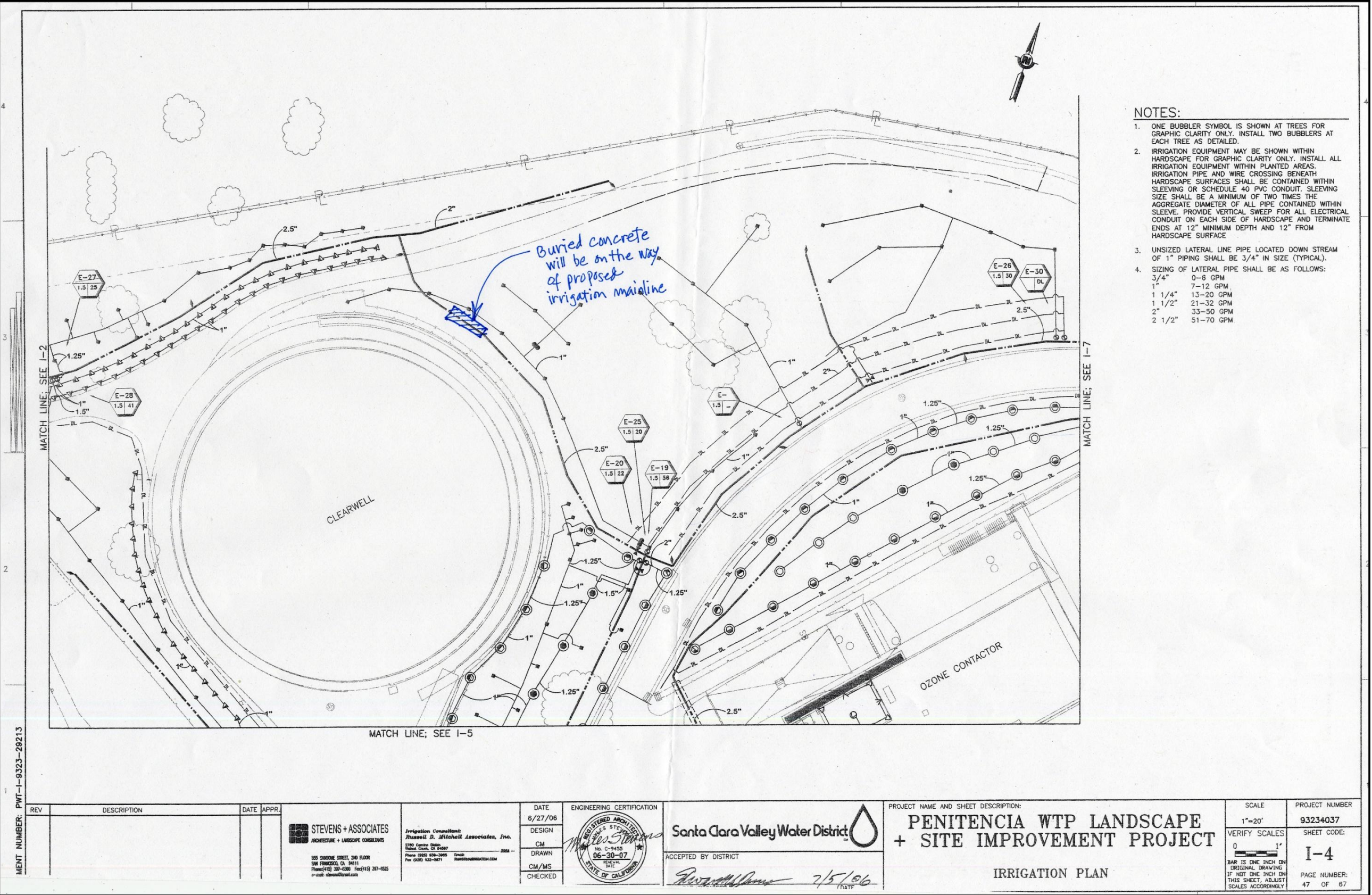
Item No.	REPLY	Extra WO Forthcoming (Yes/No)
1.	Please re-route/re-align the irrigation line installation as shown in the attached drawing.	TBD

Design Consultant:	Project Engineer <u>Mr. Smart</u> Date: <u>2/11/08</u>	Resident Inspector <u>John Doe</u> Date: <u>2/11/08</u>

NOTICE TO CONTRACTOR: This form has been designed to expedite responses to your inquiries. You may include more than one request on one form, but separate forms should be used for the different construction disciplines, e.g., architectural; civil; structural; mechanical; electrical.

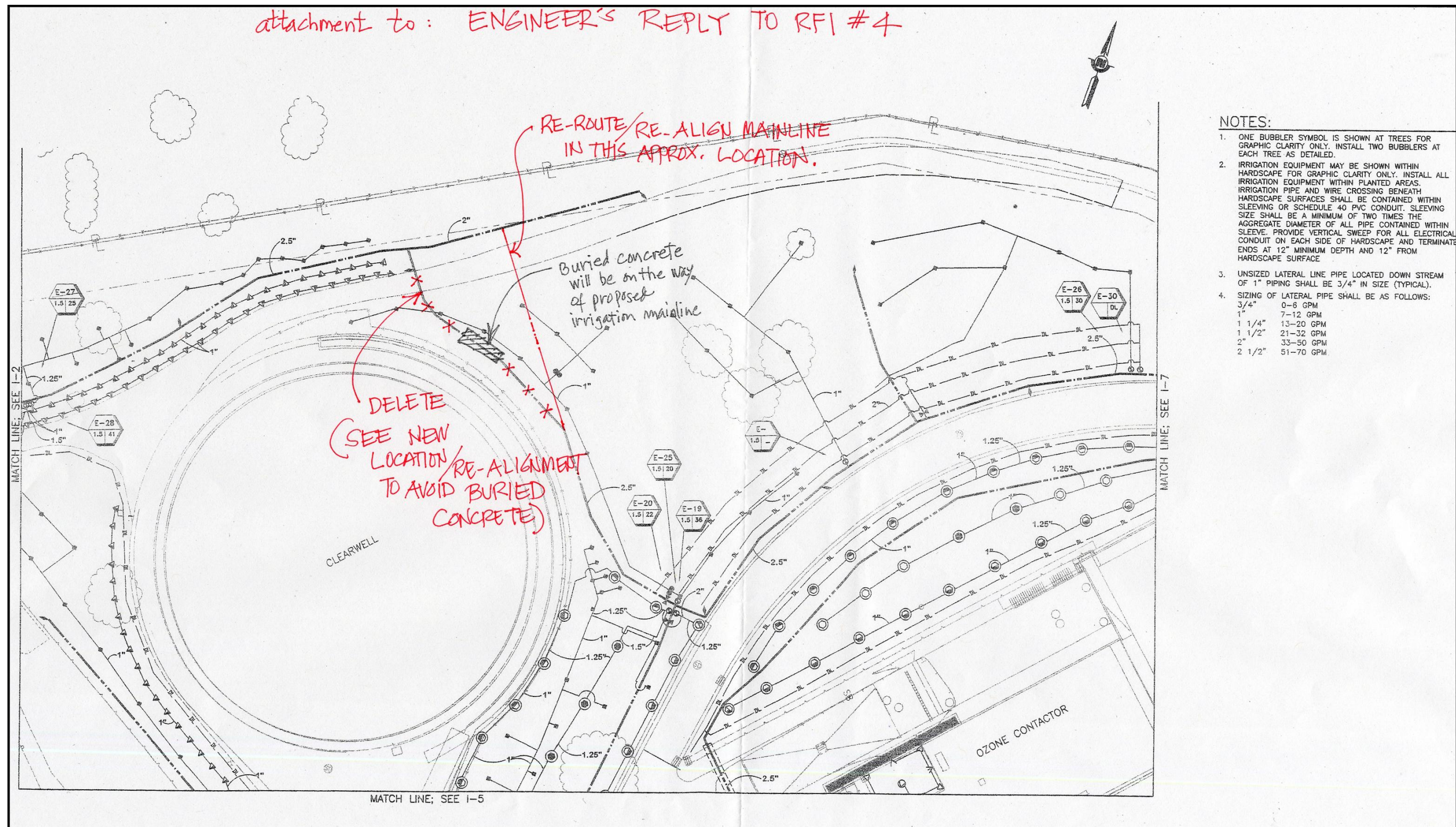
Distribution: White = Retained by Resident Inspector
Pink = Initiator
Yellow = Project Engineer
Goldenrod = Returned to Initiator with reply

Figure 5—Engineer's Response to RFI



Mark-Up on Drawing Showing RFI

Figure 6—



7—Mark-Up on Drawing Showing Engineer's Response to RFI

Figure

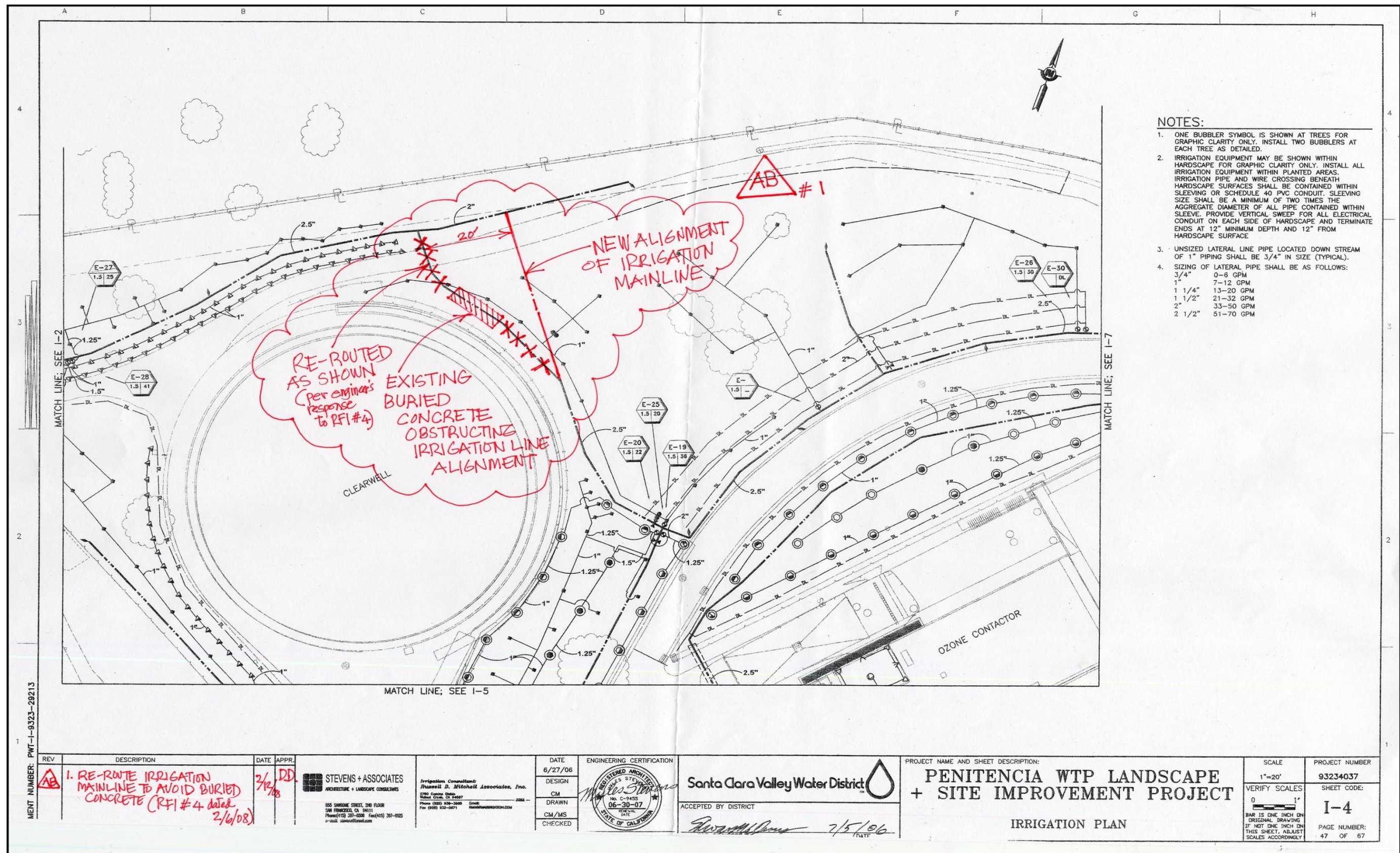


Figure 8—Contractor's Mark-Up Showing Actual Field Work

APPENDIX D

Pacheco Pumping Plant:
Best Management Practices and Mitigation Measures
Merced County Code Chapter 10.60—Noise Control

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Pacheco Pumping Plant: Priority 1 Fire Alarm and Suppression System Improvements

(WO Number 91214010-9120)

Santa Clara Valley Water District: Best Management Practices

Source: W-751-037

AQ-1 Use Dust Control Measures	The following Bay Area Air Quality Management District (BAAQMD) Dust Control Measures will be implemented: 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day; 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered; 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited; 4. Water used to wash the various exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, etc.) will not be allowed to enter waterways; 5. All vehicle speeds on unpaved roads shall be limited to 15 mph; 6. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used; 7. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations), and this requirement shall be clearly communicated to construction workers (such as verbiage in contracts and clear signage at all access points); 8. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications, and all equipment shall be checked by a certified visible emissions evaluator; 9. Correct tire inflation shall be maintained in accordance with manufacturer's specifications on wheeled equipment and vehicles to prevent excessive rolling resistance; and, 10. Post a publicly visible sign with a telephone number and contact person at the lead agency to address dust complaints; any complaints shall be responded to and take corrective action within 48 hours. In addition, a BAAQMD telephone number with any applicable regulations will be included.
AQ-2 Avoid Stockpiling Odorous Materials	Materials with decaying organic material, or other potentially odorous materials, will be handled in a manner that avoids impacting residential areas and other sensitive receptors, including: 1. Avoid stockpiling potentially odorous materials within 1,000 feet of residential areas or other odor sensitive land uses; and 2. Odorous stockpiles will be disposed of at an appropriate landfill.
BI-5 Avoid Impacts to Nesting Migratory Birds	Nesting birds are protected by state and federal laws. The District will protect nesting birds and their nests from abandonment, loss, damage, or destruction. Nesting bird surveys will be performed by a qualified biologist prior to any activity that could result in the abandonment, loss, damage, or destruction of birds, bird nests, or nesting migratory birds. Inactive bird nests may be removed with the exception of raptor nests. Birds, nests with eggs, or nests with hatchlings will be left undisturbed.
BI-6 Avoid Impacts to Nesting Migratory Birds	Nesting exclusion devices may be installed to prevent potential establishment or occurrence of nests in areas where construction activities would occur. All nesting exclusion devices will be maintained throughout the nesting season or until completion of

from Pending Construction	work in an area makes the devices unnecessary. All exclusion devices will be removed and disposed of when work in the area is complete.
BI-10 Avoid Animal Entry and Entrapment	All pipes, hoses, or similar structures less than 12 inches diameter will be closed or covered to prevent animal entry. All construction pipes, culverts, or similar structures, greater than 2-inches diameter, stored at a construction site overnight, will be inspected thoroughly for wildlife by a qualified biologist or properly trained construction personnel before the pipe is buried, capped, used, or moved. If inspection indicates presence of sensitive or state- or federally-listed species inside stored materials or equipment, work on those materials will cease until a qualified biologist determines the appropriate course of action. To prevent entrapment of animals, all excavations, steep-walled holes or trenches more than 6-inches deep will be secured against animal entry at the close of each day. Any of the following measures may be employed, depending on the size of the hole and method feasibility: 1. Hole to be securely covered (no gaps) with plywood, or similar materials, at the close of each working day, or any time the opening will be left unattended for more than one hour; or 2. In the absence of covers, the excavation will be provided with escape ramps constructed of earth or untreated wood, sloped no steeper than 2:1, and located no farther than 15 feet apart; or In situations where escape ramps are infeasible, the hole or trench will be surrounded by filter fabric fencing or a similar barrier with the bottom edge buried to prevent entry.
BI-11 Minimize Predator-Attraction	Remove trash daily from the worksite to avoid attracting potential predators to the site.
CU-1 Accidental Discovery of Archaeological Artifacts or Burial Remains	If historical or unique archaeological artifacts are accidentally discovered during construction, work in affected areas will be restricted or stopped until proper protocols are met. Work at the location of the find will halt immediately within 30 feet of the find. A "no work" zone shall be established utilizing appropriate flagging to delineate the boundary of this zone. A Consulting Archaeologist will visit the discovery site as soon as practicable for identification and evaluation pursuant to Section 21083.2 of the Public Resources Code and Section 15126.4 of the California Code of Regulations. If the archaeologist determines that the artifact is not significant, construction may resume. If the archaeologist determines that the artifact is significant, the archaeologist will determine if the artifact can be avoided and, if so, will detail avoidance procedures. If the artifact cannot be avoided, the archaeologist will develop within 48 hours an Action Plan which will include provisions to minimize impacts and, if required, a Data Recovery Plan for recovery of artifacts in accordance with Public Resources Code Section 21083.2 and Section 15126.4 of the CEQA Guidelines. If burial finds are accidentally discovered during construction, work in affected areas will be restricted or stopped until proper protocols are met. Upon discovering any burial site as evidenced by human skeletal remains, the County Coroner will be immediately notified and the field crew supervisor shall take immediate steps to secure and protect such remains from vandalism during periods when work crews are absent. No further excavation or disturbance within 30 feet of the site or any nearby area reasonably suspected to overlie adjacent remains may be made except as authorized by the County Coroner, California Native American Heritage Commission, and/or the County Coordinator of Indian Affairs.
HM-7 Restrict Vehicle and Equipment Cleaning to	Vehicles and equipment may be washed only at approved areas. No washing of vehicles or equipment will occur at job sites.

Appropriate Locations	
HM-8 Ensure Proper Vehicle and Equipment Fueling and Maintenance	No fueling or servicing will be done in a waterway or immediate flood plain, unless equipment stationed in these locations is not readily relocated (i.e., pumps, generators). 1. For stationary equipment that must be fueled or serviced on-site, containment will be provided in such a manner that any accidental spill will not be able to come in direct contact with soil, surface water, or the storm drainage system. 2. All fueling or servicing done at the job site will provide containment to the degree that any spill will be unable to enter any waterway or damage riparian vegetation. 3. All vehicles and equipment will be kept clean. Excessive build-up of oil and grease will be prevented. 4. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Maintenance, repairs, or other necessary actions will be taken to prevent or repair leaks, prior to use. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be done in a channel or flood plain.
HM-9 Ensure Proper Hazardous Materials Management	Measures will be implemented to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means. 1. Prior to entering the work site, all field personnel will know how to respond when toxic materials are discovered. 2. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers with appropriate secondary containment to prevent any spillage or leakage. 3. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials will not contact soil and not be allowed to enter surface waters or the storm drainage system. 4. All toxic materials, including waste disposal containers, will be covered when they are not in use, and located as far away as possible from a direct connection to the storm drainage system or surface water. 5. Quantities of toxic materials, such as equipment fuels and lubricants, will be stored with secondary containment that is capable of containing 110% of the primary container(s). 6. The discharge of any hazardous or non-hazardous waste as defined in Division 2, Subdivision 1, Chapter 2 of the California Code of Regulations will be conducted in accordance with applicable State and federal regulations. In the event of any hazardous material emergencies or spills, personnel will call the Chemical Emergencies/Spills Hotline at 1-800-510-5151.
HM-10 Utilize Spill Prevention Measures	Prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water following these measures: 1. Field personnel will be appropriately trained in spill prevention, hazardous material control, and clean up of accidental spills; 2. Equipment and materials for cleanup of spills will be available on site, and spills and leaks will be cleaned up immediately and disposed of according to applicable regulatory requirements; 3. Field personnel will ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means; 4. Spill prevention kits will always be in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations), and all field personnel will be advised of these locations; and,

	5. The work site will be routinely inspected to verify that spill prevention and response measures are properly implemented and maintained.
HM-12 Incorporate Fire Prevention Measures	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. An extinguisher shall be available at the project site at all times when welding or other repair activities that can generate sparks (such as metal grinding) is occurring. Smoking shall be prohibited except in designated staging areas and at least 20 feet from any combustible chemicals or vegetation.
WQ-4 Limit Impacts From Staging and Stockpiling Materials	1. To protect on-site vegetation and water quality, staging areas should occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation. Similarly, all equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. 2. Building materials and other project-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains. 3. No runoff from the staging areas may be allowed to enter water ways, including the creek channel or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, swale, hay wattles or bales, silt screens). 4. The discharge of decant water to water ways from any on-site temporary sediment stockpile or storage areas is prohibited. 5. During the wet season, no stockpiled soils will remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control. During the dry season; exposed, dry stockpiles will be watered, enclosed, covered, or sprayed with non-toxic soil stabilizers.
WQ-5 Stabilize Construction Entrances and Exits	Measures will be implemented to minimize soil from being tracked onto streets near work sites: 1. Methods used to prevent mud from being tracked out of work sites onto roadways include installing a layer of geotextile mat, followed by a 4-inch thick layer of 1 to 3-inch diameter gravel on unsurfaced access roads. Access will be provided as close to the work area as possible, using existing ramps where available and planning work site access so as to minimize disturbance to the water body bed and banks, and the surrounding land uses.
WQ-11 Maintain Clean Conditions at Work Sites	The work site, areas adjacent to the work site, and access roads will be maintained in an orderly condition, free and clear from debris and discarded materials on a daily basis. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust into storm drains or waterways. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged. Any materials and equipment left on the site overnight will be stored to avoid erosion, leaks, or other potential impacts to water quality Upon completion of work, all building materials, debris, unused materials, concrete forms, and other construction-related materials will be removed from the work site.
WQ-16 Prevent Stormwater Pollution	To prevent stormwater pollution, the applicable measures from the following list will be implemented: 1. Soils exposed due to project activities will be seeded and stabilized using hydroseeding, straw placement, mulching, and/or erosion control fabric. These measures will be implemented such that the site is stabilized and water quality

	protected prior to significant rainfall. In creeks, the channel bed and areas below the Ordinary High Water Mark are exempt from this BMP. - The preference for erosion control fabrics will be to consist of natural fibers; however, steeper slopes and areas that are highly erodible may require more structured erosion control methods. No non-porous fabric will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would be impacted by the application. - Erosion control measures will be installed according to manufacturer's specifications. - To prevent stormwater pollution, the appropriate measures from, but not limited to, the following list will be implemented: - Silt Fences - Straw Bale Barriers - Brush or Rock Filters - Storm Drain Inlet Protection - Sediment Traps or Sediment Basins - Erosion Control Blankets and/or Mats - Soil Stabilization (i.e. tackified straw with seed, jute or geotextile blankets, etc.) - Straw mulch. - All temporary construction-related erosion control methods shall be removed at the completion of the project (e.g. silt fences). Surface barrier applications installed as a method of animal conflict management, such as chain link fencing, woven geotextiles, and other similar materials, will be installed no longer than 300 feet, with at least an equal amount of open area prior to another linear installation.
United States Department of the Interior: Fish and Wildlife Service – Operations and Maintenance Programmatic Biological Opinion – Bureau of Reclamation - South-Central California Area Office Source: 1-1-04-F-0368	
General: Work Requirements	- Cross-country travel is prohibited. - Training will be held for all persons prior to beginning work and repeated as needed. - Sign-in sheets are required and must be provided to the District and Reclamation. - Training will be communicated in multiple languages, as needed. - No firearms are permitted on-site. - The biologist shall have oversight and authority to stop project activities if requirements are not fulfilled. If a stop work is required due to take of any listed species, Service and CDFW will be notified within one day. - A 20 MPH speed limit be observed along road and inside work areas. - Cover or fill excavations greater than 2 feet deep. - Project activities shall not extend beyond the project area. - All grindings and asphaltic-concrete waste shall be stored in previously disturbed areas and a minimum of 150 feet from any culvert, wash, pond, or stream. - Restoration and revegetation shall be done using endemic plant material. - The construction area shall be delineated to construction personnel. - All activities will cease one half hour before sunset and will not begin prior to one half hour before sunrise. Lighting during nighttime is prohibited.
CRLF: Work Requirements	A Service approved biologist shall survey the work site two weeks before the onset of activities.

	• Contact Service-approved biologist before work begins if CRLF cannot be relocated within ¼ mile of work site, within the same drainage. • Conduct a CRLF training for all construction personnel, repeat as needed. • Remove or contain all trash and debris that may attract predators. • Remove all trash and debris following construction. • All fuel and maintenance of equipment and vehicles and all staging areas must occur at least 20 meters (~65.5 feet) from riparian habitat or water body. • Inform workers about spill prevention and containment measures. • Prewash all equipment new to the site to avoid the spread of invasive species. • Limit staging and work areas to minimum necessary needed. • Work activities should be completed between April 1 and November 1 in areas where frogs may be affected. ◦ Contact must be made with the Service if beginning work outside this period. • Remove from the wild all invasive species encountered. • Additional or modified measures to reduce the adverse effects of actions may be identified during project review by Reclamation and Service. • If take cannot be avoided, contact Service for information prior to starting.
SJKF: Work Requirements	• A Service approved biologist shall complete a pre-work survey no more than 30 calendar days in advance of the work. • All dens shall be protected to the maximum extent practicable, as determined by the biologist. • If occupied natal den is visible or within project limits, or other accessible land, or on public accessible land within 1000 feet of project area, the project will be constructed between August 1 and November 30. And Service shall be contacted before any project action occurs. • Establish buffer to protect the physical den and surrounding habitat of unoccupied natal dens and all non-natal dens that can be avoided. ◦ Unoccupied natal dens shall be surrounded with a 200-foot buffer ◦ Occupied natal dens shall have ground disturbance restricted during December 1 through July 31. During this period, project activities are prohibited within 0.3 miles. • Pipes or culverts with a diameter greater than 4 inches shall be capped or taped closed when no San Joaquin kit fox is present. Any kit fox found in a pipe or culvert shall be allowed to escape unimpeded. • If a natural den cannot be avoided, refer to the guidelines.

Merced County Code

Title 10 PUBLIC PEACE, MORALS AND WELFARE

Chapter 10.60 NOISE CONTROL

10.60.010 Legislative purpose and intent.

The board of supervisors finds and declares that:

A. Excessive noise is a serious hazard to the public health, welfare and safety of the people of the county of Merced, and is contrary to the public interest by interfering with restful sleep, communication, relaxation and the full use of one's property; and

B. Inadequately controlled excessive noise is a persistent danger to the health and welfare of the residents of the county of Merced, and the level and frequency of disturbing, excessive, offensive or unusually loud noise within the jurisdictional limits of the county of Merced threatens to increase unless reasonably controlled; and

C. The creation, making, causing, or continuation of such excessive noise that is prolonged or unusual in time, place and use will detrimentally affect the public health, comfort, convenience, safety, welfare, and quality of life of the residents of the county of Merced; and

D. Every person in the county of Merced is entitled to an environment where excessive noise is not detrimental to his or her life, health, and enjoyment of property; and

E. It is the intent of this chapter to prevent excessive noise that may jeopardize the health, welfare, or safety of the citizens of the county of Merced or degrade the quality of their lives, and thereby to promote and secure the protection of the public health, comfort, convenience, safety, welfare, prosperity, peace and quiet of the county of Merced and its people from excessive levels of noise. (Ord. 1726 § 1, 2004).

10.60.020 Definitions.

As used in this chapter, the following words, phrases and terms shall have the following meanings:

“Agricultural property” means land used for or devoted to the production of crops and livestock.

“Ambient sound level” means the total sound pressure in the area of interest including the noise source of interest.

“A-weighting” means the electronic filtering in sound level meters that models human hearing frequency sensitivity.

“Background sound level” means the total sound pressure level in the area of interest excluding the noise source of interest.

“Construction” means any site preparation, assembly, construction, erection, repair, enlargement, alteration, conversion or similar action, or demolition of any building, structure or land.

“C-weighting” means the electronic filtering in sound level meters that models a flat response (output equals input) over the range of maximum human hearing frequency sensitivity.

“dBA” means the A-weighted unit of sound pressure level.

“dBC” means the C-weighted unit of sound pressure level.

“Decibel” or “dB” means the unit of measurement for sound pressure level at a specified location.

“Emergency work” means any work or action necessary to deliver essential services, including, but not limited to, repairing water, gas, electric, telephone, sewer facilities, or public transportation facilities, removing fallen trees on public rights-of-way, or abating life-threatening conditions.

“Ldn” means the day/night average sound level during a twenty-four (24) hour day.

“Lmax” means the maximum noise level recorded during a single event.

“Measuring instrument” means an instrument such as a sound level meter, integrating sound level meter or dosimeter used to measure sound pressure levels conforming to Type 1 or Type 2 standards as specific in the latest version of American National Standard Institute S1.4-1983.

“Noise” means any sound of such level and duration as to be or tend to be injurious to human health or welfare, or which would unreasonably interfere with the enjoyment of life or property throughout the unincorporated county or in any portions thereof, but excludes all aspects of the employer-employee relationship concerning health and safety hazards within the confines of a place of employment.

“Noise disturbance” means any sound that:

1. Endangers the safety or health of any person;
2. Disturbs a reasonable person of normal sensitivities;
3. Endangers personal or real property; or
4. Violates the quantitative standards set forth in this chapter.

“Noise control officer” or “NCO” means the noise control officer of the county of Merced as designated from time to time by the Merced County board of supervisors, or a duly authorized designee.

“Off-highway vehicle” means motorcycles, sand buggies, dune buggies, all-terrain vehicles, jeeps, enduro bikes, motocross dirt bikes, mopeds, mini bikes, go-carts, or any similar vehicle as defined in Section 38006 of the California Vehicle Code. “Off-highway vehicle” specifically excludes self-propelled lawnmowers, agricultural equipment and such vehicles described in Section 38010(b) of the California Vehicle Code.

“Person” means any individual, corporation, company, association, society, firm partnership, or joint stock company, but shall not include the county of Merced.

“Public right-of-way” means any street, avenue, boulevard, road, highway, sidewalk, or alley that is leased to or owned by a government entity, licensed to a government entity, or subject to an easement granted to a government entity.

“Public space” means any real property or structures thereon that is owned, leased, or controlled by a government entity.

“Pure tone” means any sound that can be judged as a single pitch or set of single pitches by the NCO.

“Real property line” means the imaginary line, including its vertical extension, that separates one parcel of real property from another.

“Residential property” means property used for human habitation, including:

1. Private property used for human habitation;
2. Commercial living accommodations and commercial property used for human habitation;
3. Recreational and entertainment property used for human habitation; and
4. Community service property used for human habitation.

“Sound level” means the instantaneous sound pressure level measured in decibels with a sound level meter set for A-weighting on slow integration speed, unless otherwise noted.

“Sound pressure level” means twenty (20) multiplied by the logarithm, to the base 10, of the measured sound pressure divided by the sound pressure associated with the threshold of human hearing, in units of decibels.

“Weekday” is any day, Monday through Friday, that is not a legal holiday. (Ord. 1869 § 1, 2009; Ord. 1726 § 1, 2004).

10.60.030 Sound level limitations.

A. No person shall cause, suffer, allow, or permit the operation of any sound source on private property in such a manner as to create a sound level that results in any of the following, when measured at or within the real property line of the receiving property:

1. Exceeds the background sound level by at least ten (10) dBA during daytime hours (seven a.m. to ten p.m.) and by at least five dBA during nighttime hours (ten p.m. to seven a.m.). The background sound level for purposes of this section shall be determined as set forth in Section 10.60.060; or

2. Exceeds sixty-five (65) dBA Ldn on residential real property or seventy (70) dBA Ldn on nonresidential real property; or

3. Exceeds seventy-five (75) dBA Lmax on residential real property or eighty (80) dBA Lmax on nonresidential real property.

B. The following are exempt from the sound level limits of Section 10.60.030(A):

1. Noise from emergency signaling devices;

2. Noise from an exterior burglar alarm of any building provided such burglar alarm shall terminate its operation within five minutes of its activation;

3. Noise from domestic power tools, lawn mowers, and agricultural equipment when operated between seven a.m. and eight p.m. on weekdays and between eight a.m. and eight p.m. on weekends and legal holidays, provided they generate less than eighty-five (85) dBA at or within any real property line of a residential property;

4. Sound from church bells and chimes when a part of a religious observance or service;

5. Noise from construction activity, provided that all construction in or adjacent to urban areas shall be limited to the daytime hours between seven a.m. and six p.m., and all construction equipment shall be properly muffled and maintained.

C. When the source being analyzed is a stereo system with low frequency signals as part of its output, the stereo shall not cause a C-weighted level of ten (10) dB or greater above the C-weighted ambient level at a distance of ten (10) feet from the source, or the complainant’s real property line, whichever is greater. (Ord. 1869 § 2, 2009; Ord. 1726 § 1, 2004).

10.60.040 Specific prohibited acts.

A. No person shall cause, suffer, allow, or permit to be made verbally or mechanically any noise disturbance.

B. No person shall cause, suffer, allow, or permit to the following acts:

1. Operating, playing, or permitting the operation or playing of any stereo, radio, television, phonograph, or similar device that reproduces or amplifies sound in such a manner as to create a noise disturbance for any person other than the operator of the device;

2. Using or operating any loudspeaker, public address system, or similar device between ten p.m. and eight a.m. the following day, such that the sound therefrom creates a noise disturbance across a residential real property line;
3. Owning, possessing, or harboring any animal or bird that, frequently or for continued duration, generates sounds that create a noise disturbance across a residential real property line;
4. Loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, liquids, garbage cans, refuse, or similar objects, or the pneumatic or pumped loading or unloading of bulk materials in liquid, gaseous, powder, or pellet form, or the compacting of refuse by persons engaged in the business of scavenging or garbage collection, whether private or municipal, between nine p.m. and seven a.m. the following day on a weekday and between nine p.m. and nine a.m. the following day on a weekend day or legal holiday except by permit, when the sound therefrom creates a noise disturbance across a residential real property line;
5. Operating or permitting the operation of any tools or equipment used in construction, drilling, earthmoving, excavating, or demolition work between six p.m. and seven a.m. the following day on a weekday or at any time on a weekend day or legal holiday, except for emergency work, or when the sound level does not exceed any applicable relative or absolute limit specified in Section 10.60.030;
6. Using, operating, or permitting the operation of one or more off-highway vehicles on private property such that the resulting sound creates a noise disturbance across a residential real property line. (Ord. 1869 § 3, 2009; Ord. 1726 § 1, 2004).

10.60.050 Exemptions.

- A. The provisions of this chapter shall not apply to:
 1. Activities conducted in public parks, public playgrounds, and public or private school grounds, including, but not limited to, school athletic and school entertainment events;
 2. Noise sources associated with agricultural activities or agricultural operations on agricultural property, including without limitation those specified in Section 18.56.010(B) of this Code;
 3. The generation of sound for the purpose of alerting persons to the existence of an emergency, except as provided in Section 10.60.030(D)(2);
 4. The generation of sound in the performance of emergency work;
 5. The generation of sound in situations within the jurisdiction of the federal Occupational Safety and Health Administration;
 6. Any land use for which a valid discretionary land use permit, such as a conditional use permit or an administrative permit, has been issued by the county prior to the effective date of the ordinance codified in this chapter, or which may be issued by the county, it being the intention of the county that the process for granting discretionary land use permits, including the imposition of conditions, be separate and independent of this chapter; or
 7. Using, operating, or permitting the operation of one or more off-highway vehicles on public land, other than a highway, was described by California Vehicle Code Section 38001.
- B. Noise generated from any county-sponsored or county-approved events or celebrations shall also be exempt from the provisions of this chapter. (Ord. 1869 § 4, 2009; Ord. 1726 § 1, 2004).

10.60.060 Sound measurement procedures.

A. Insofar as practicable, sound will be measured while the source under investigation is operating at normal, routine conditions and, as necessary, at other conditions, including, but not limited to, design, maximum, and fluctuating rates.

B. All tests shall be conducted in accordance with the following procedures:

1. To the extent practicable, all sources contributing sound to the point of measurement shall be identified.
2. Measurements shall be taken at or within the real property line of the affected person.
3. The measuring instrument must be calibrated using a calibrator recommended by the measuring instrument manufacturer before and after each series of readings.

4. The measuring instrument must be recertified and the calibrator must be recalibrated at least once each year by the manufacturer or by a person that has been approved by the manufacturer. A copy of written documentation of such recertification and recalibration shall be kept with the equipment to which it refers.

5. No outdoor measurements shall be taken:

- a. During periods when wind speeds (including gusts) exceed fifteen (15) mph;
- b. Without a windscreen, recommended by the measuring instrument manufacturer, properly attached to the measuring instrument;
- c. Under any condition that allows the measuring instrument to become wet (e.g., rain, snow, or condensation); or
- d. When the ambient temperature is out of the range of the tolerance of the measuring instrument.

C. The report for each measurement session shall include:

1. The date, day of the week, and times at which measurements are taken;
 2. The times of calibration;
 3. The weather conditions;
 4. The identification of all monitoring equipment by manufacturer, model number, and serial number;
 5. The normal operating cycle of the sources in question with a description of the sources;
 6. The ambient sound level, in dBA, with the sources in question operating;
 7. The background sound level, in dBA, without the sources in question operating; and
 8. A sketch of the measurement site, including measurement locations and relevant distances, containing sufficient information for another investigator to repeat the measurements under similar conditions.
- D. Prior to taking noise measurements the investigator shall explore the vicinity of the source in question to identify any other sound sources that could affect measurements, to establish the approximate location and character of the principal sound source, and to select suitable locations from which to measure the sound from the source in question.

E. When measuring continuous sound, or sound that is sustained for more than one second at a time, the measuring instrument shall be set for A-weighting, slow response, and the range (if the measuring is designed to read levels over different ranges) shall be set to that range in which the meter reads closest to the middle of the scale. The minimum and maximum readings shall be recorded to indicate the range of monitored values along with the central tendency average most often displayed.

F. The measuring instrument shall be placed at a minimum height of three feet above the ground or from any reflective surface. When handheld, the microphone shall be held at arm's length and pointed at the source at the angle recommended by the measuring instrument's manufacturer.

G. If extraneous sound sources, such as aircraft flyovers or barking dogs, that are unrelated to the measurements increase the monitored sound levels, the measurements should be postponed until the extraneous sounds have become of such a level as not to increase the monitored sound levels of interest.

H. The monitoring session should last for a period of time sufficient to ensure that the sound levels measured are typical of the source in question.

I. The background sound levels shall be subtracted from the measured sound levels of the source of interest by using Table 2, to determine the sound levels from the source of interest alone. If the ambient sound level is less than 3 dBA higher than the background sound level, the source level cannot be derived and violation of the chapter cannot be substantiated.

Table 2
Correction for Background Levels

Difference Between Ambient and Background Sound Levels	Correction Factor to Be Subtracted from Ambient Level for Source Level
3	3
4-5	2
6-9	1
10 or more	0

(Ord. 1726 § 1, 2004).

10.60.070 Violation—Enforcement.

A. The Merced County board of supervisors, or a duly authorized designee, shall from time to time, designate a noise control officer to enforce this chapter. Unless otherwise designated, the noise control officer for the county of Merced shall be the sheriff.

B. Any person violating any provision of this chapter is guilty of the offenses and subject to the penalties set forth in Chapter 1.28, Section 1.28.030, of the Merced County Code for the first violation, except that a second and any subsequent violations occurring within a year of the first violation may be charged as a misdemeanor and is subject to the penalties set forth in Chapter 1.28, Section 1.28.020, of the Merced County Code.

C. If the violation is of a continuing nature, each day during which it occurs shall constitute an additional, separate, and distinct offense, pursuant to Chapter 1.28, Section 1.28.040, of the Merced County Code.

D. The provisions of this chapter are enforceable pursuant to Chapter 1.20, Section 1.20.020, of the Merced County Code for the first violation, except that a second and any subsequent violations occurring within a year of the first violation are enforceable pursuant to Chapter 1.20, Section 1.20.010, of the Merced County Code.

E. The noise control officer is authorized to take all necessary actions to enforce the provisions of this chapter, including the issuance of stop orders to prohibit further violations of this chapter, and to carry out any other special enforcement programs initiated by order or resolution of the board of supervisors.

F. In the event that any person fails to abate a violation hereunder after notice of same and an opportunity to correct or end the violation, the noise control officer is authorized to request the county counsel or district attorney to apply to the Superior Court of this county for an order authorizing the noise control officer to undertake those actions necessary to abate the violation, or for a court order to immediately abate the violation, and requiring the violator to pay for the costs of any such undertaking.

G. No provision of this chapter shall be construed to impair any common law or statutory cause of action or legal remedy of any person, including the county, for injury or damage arising from any violation of this ordinance or from other law. (Ord. 1869 § 5, 2009; Ord. 1726 § 1, 2004).

10.60.080 Recovery of administrative costs.

A. The noise control officer shall maintain records of all administrative costs associated with enforcement and enforcement proceedings, and shall recover such costs from the property owner or person in control of the property from which the noise source originates, as provided herein.

B. The hourly rate charged for staff time shall from time to time be determined by resolution of the Merced County board of supervisors.

C. If the noise control officer determines that a violation of the provisions of this chapter exists, he or she shall give two notices to the property owner of record or any person in control of the property from which the noise source is originating, which notices shall state the existence of the violation, that the county intends to charge the property owner for all administrative costs associated with enforcement, and state the owner's right to object to the imposition of such costs. The notices shall be in substantially the following form:

NOTICE OF VIOLATION

To: (Name of Property Owner of Record or Person in Control of the Property)

(Address)

The Noise Control Officer has determined that conditions exist at the property located at (specify address) that violate the provisions of Chapter 10.60 of the Merced County Code, "Noise Ordinance." You must correct or remove such violation or violations no later than (specify date). Failure to correct or remove the violation by the date specified above will result in all cumulative administrative costs being charged against you in accordance with the provisions of Merced County Code, Chapter 10.60.080. If the violation is corrected or removed by the date specified, no administrative costs will be assessed.

FINAL NOTICE

To: (Name of Property Owner of Record or Person in Control of the Property)

(Address)

You were notified on (specify date) that a violation or violations of the provisions of Chapter 10.60 of the Merced County Code, "Noise Ordinance," exists on property located at (specify address).

You failed to correct or remove the violation within the time allotted in the prior notice given to you. You are hereby notified that as a part of the resolution of this matter, you will be required to pay an amount equal to all cumulative administrative costs incurred in this enforcement proceeding. Written notice of the charges will be given. You have the right to contest the amount charged. To contest the amount due, you must file a Notice of Contest with the Noise Control Officer by (specify date).

D. At the conclusion of the case, which shall occur upon termination of the enforcement action, the noise control officer shall send a written notice of charges to the property owner of record or person in control of the property setting forth a summary of time and hourly charges. The notice of charges shall be in substantially the following form:

NOTICE OF CHARGES

**To: (Name of Property Owner of Record or Person in Control of the Property)
(Address)**

**The Noise Control Officer determined that the administrative costs incurred in the enforcement proceedings and actions taken in regard to the violation or violations of Chapter 10.60 of the Merced Ordinance Code existing on the property located at (specify address) are
\$_____.**

**If you wish to contest these charges you must file a Request for Hearing together with an appeal fee with the Noise Control Officer by
(specify date).**

IF YOU FAIL TO TIMELY FILE A REQUEST FOR HEARING, YOUR RIGHT TO CONTEST THE ABOVE CHARGES WILL BE DEEMED WAIVED AND YOU WILL BE LIABLE TO THE COUNTY FOR THESE CHARGES, WHICH MAY BE RECOVERED IN A CIVIL ACTION FILED BY THE COUNTY IN A COURT OF COMPETENT JURISDICTION.

Dated: _____

Noise Control Officer: _____

E. If: (1) no request for hearing is timely filed; or (2) after a hearing the noise control officer affirms the validity of the costs, the property owner or person in control and possession shall be liable to the county in the amount stated in the notice of charges or any lesser amount as determined by the noise control officer. These costs shall be recoverable in a civil action in the name of the county in any court of competent jurisdiction. Any property owner, or other person having possession and control thereof, receiving a notice of charges shall have the right to contest the amount of said charges in accordance with the following procedures:

1. A request for hearing shall be filed with the noise control officer within ten (10) days of the date appearing on the notice of charges. The form for request for hearing may be obtained from the noise control officer. An appeal fee shall be charged by the noise control officer for filing the request for hearing.

2. Within thirty (30) days of the filing of the request for hearing and payment of the appeal fee, and on ten (10) days written notice to the property owner or other person having possession and control thereof, the noise control officer shall hold a hearing on the objections stated in the request for hearing, and determine the validity of the costs stated in the notice of charges and the objections thereto.

3. In determining the validity of the costs, the noise control officer shall consider whether the costs stated in the notice of charges are reasonable under the circumstances. Factors to be considered include, but are not limited to, the following: whether the present owner created the violation; whether there is a present ability to correct the violation; whether the owner moved promptly to correct the violation; the degree of cooperation provided by the owner; whether reasonable minds differ as to whether a violation exists.

4. The noise control officer's decision is final and there no further appeal within the county. Any further review of the noise control officer's decision must be pursued in a court of law. (Ord. 1869 § 6, 2009; Ord. 1726 § 1, 2004).

10.60.090 Administrative costs of sheriff's personnel for noise control enforcement.

1. Law Enforcement	\$90.00
(Commander, Sheriff Sergeant, Deputy Sheriff I/II)	per hour
2. Law Enforcement Administrative Support (Dispatch, Records, Transcription, Accounting, Data Processing, Correspondence)	\$60.00 per hour

Note: Items to be pro-rated based on actual time.

(Ord. 1726 § 1, 2004).

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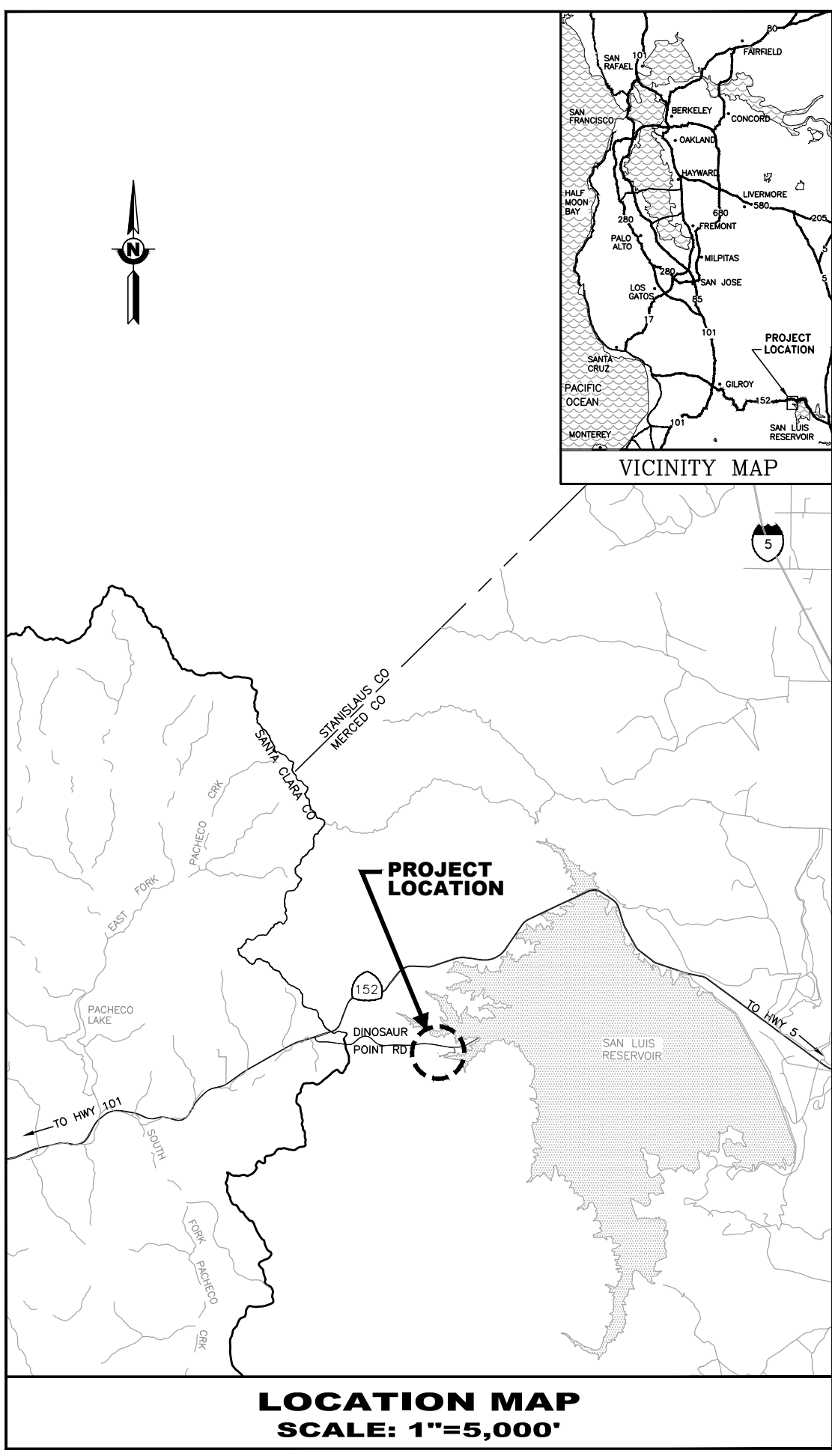
APPENDIX E

Plan Set for the Construction of Pacheco Pumping Plant Priority 1 Fire Alarm & Suppression System Improvement Project

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USERNAME: RoyceO Wed 19 Feb 2020 06:07am
FILENAME: \\KJC\KJC-Root\KJC-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\G-01

DOCUMENT NUMBER: PPP-G-9121-64408



CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

PACHECO PUMPING PLANT

FIRE ALARM & SUPPRESSION

SYSTEM IMPROVEMENTS PROJECT

HOLLISTER, CALIFORNIA

SANTA CLARA VALLEY WATER DISTRICT



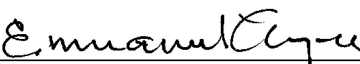
PREPARED BY:

 Kennedy Jenks

 2/14/20
KERWIN C. ALLEN, P.E. DATE
PRINCIPAL ENGINEER

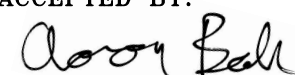


APPROVED BY:

 3/17/2020
EMMANUEL ARYEE, P.E. DATE
CAPITAL ENGINEERING MANAGER
WATER UTILITY CAPITAL DIVISION

 3/17/2020
HEATH MCMAHON, P.E. DATE
DEPUTY OPERATING OFFICER
WATER UTILITY CAPITAL DIVISION

ACCEPTED BY:

 3/17/2020
AARON BAKER, P.E. DATE
DEPUTY OPERATING OFFICER
RAW WATER OPERATIONS & MAINTENANCE DIVISION

CONTRACT NUMBER	C-0653
PROJECT NUMBER	91214010
SHEET CODE:	G-01

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DRAWING INDEX

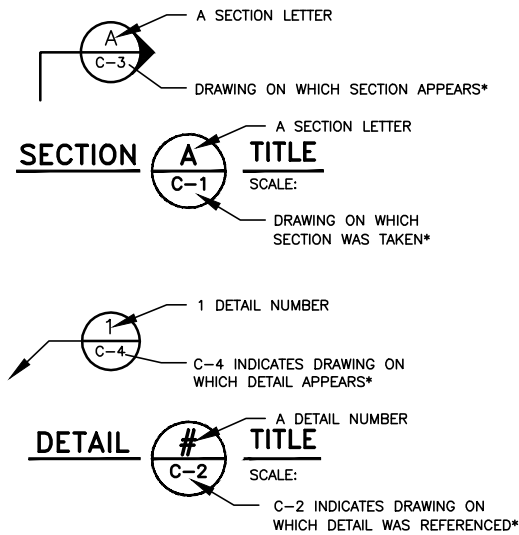
SHEET CODE	DESCRIPTION	SHEET NUMBER
GENERAL		
G-01	TITLE SHEET, LOCATION AND VICINITY MAPS	1 OF 14
G-02	DRAWING INDEX, GENERAL NOTES, AND LEGEND	2 OF 14
G-03	ABBREVIATIONS	3 OF 14
G-04	SITE PLAN AND SITE ACCESS	4 OF 14
MECHANICAL		
M-01	FIRE PROTECTION SYSTEM PLAN	5 OF 14
M-02	HVAC MODIFICATIONS	6 OF 14
M-03	SYSTEM SCHEMATIC, SECTION, AND DETAILS	7 OF 14
ELECTRICAL		
E-01	ABBREVIATIONS, LEGEND AND NOTES	8 OF 13
E-02	FIRE ALARM BLOCK DIAGRAM	9 OF 13
E-03	MAIN STRUCTURE SINGLE LINE, PANELBOARD AND LTG SCHEDULE	10 OF 14
E-04	MAIN STRUCTURE (BASEMENT) FIRE ALARM SYSTEM AND EXIT LIGHTING	11 OF 14
E-05	MAIN STRUCTURE (BASEMENT) FIRE ALARM HVAC DUCT DETECTORS	12 OF 14
E-06	MAIN STRUCTURE (CRAWL SPACE) FIRE ALARM SYSTEM	13 OF 14
E-07	MAIN STRUCTURE MEZZANINE LEVEL	14 OF 14

GENERAL NOTES

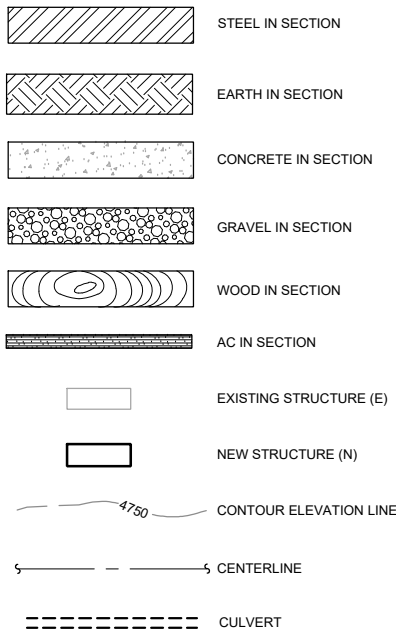
- THE DRAWINGS ARE ORGANIZED BY GENERAL, MECHANICAL, AND ELECTRICAL WORK FOR CONVENIENCE ONLY. HOWEVER, ANY TYPE OF WORK MAY BE SHOWN ON ANY DISCIPLINE OF DRAWING. FURTHER, NEW WORK MAY BE SHOWN ON DEMOLITION DRAWINGS AND VICE VERSA.
- WHERE THE WORK IS DEPENDENT UPON THE DIMENSIONS OF EXISTING FACILITIES, THE CONTRACTOR SHALL VERIFY THE DIMENSIONS IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION.
- THE EXISTING UNDERGROUND UTILITIES AND PIPELINES ARE SHOWN AT APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS OF ALL EXISTING UTILITIES AND PIPELINES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DAMAGE WHICH IS CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE UNDERGROUND UTILITIES AND PIPELINES PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL PROTECT ALL EXISTING PIPES, DUCTS AND EQUIPMENT IN THE AREAS WHERE WORK IS TO BE PERFORMED. ANY DAMAGE SHALL BE REPAIRED OR REPLACED TO THE AGENCY'S SATISFACTION AT THE CONTRACTOR'S COST.
- ALL EXISTING SURFACES DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED AT THE CONTRACTOR'S EXPENSE.
- WHEN EQUIPMENT AND/OR PIPING IS TO BE DEMOLISHED BY THIS CONTRACT, THE CONTRACTOR SHALL REMOVE ALL ACCESSORY ITEMS, ASSOCIATED BOLTS, SUPPORTS, AND CONCRETE PADS AS WELL, UNLESS OTHERWISE SHOWN. IN ADDITION, ALL PROTRUDING ITEMS SHALL BE GROUND SMOOTH AND PIPES PLUGGED (OR CAPPED). ALL SURFACES AFTER REMOVAL SHALL BE FINISHED TO MATCH SURROUNDING AREAS.
- ALL MECHANICAL AND ELECTRICAL WORK AND MATERIALS SHALL CONFORM IN EVERY ASPECT TO THE LATEST MERCED COUNTY BUILDING CODE AND ALL APPLICABLE SUPPLEMENTS, EXCEPT WHERE EXCEEDED IN PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL SUPPLY ALL MATERIALS, EQUIPMENT, LABOR AND ALL APPURTENANCES AS SHOWN AND SPECIFIED.
- CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, COUNTY AND LOCAL LAWS, AND REGULATIONS WITH RESPECT TO SAFETY, WORKING HOURS, NOISE, AIR POLLUTION AND SANITARY CONDITIONS.
- THE CONTRACTOR IS REQUIRED TO HAVE CLASS A C-10 LICENSE ISSUED BY THE STATE OF CALIFORNIA.

DETAIL AND SECTION DESIGNATION

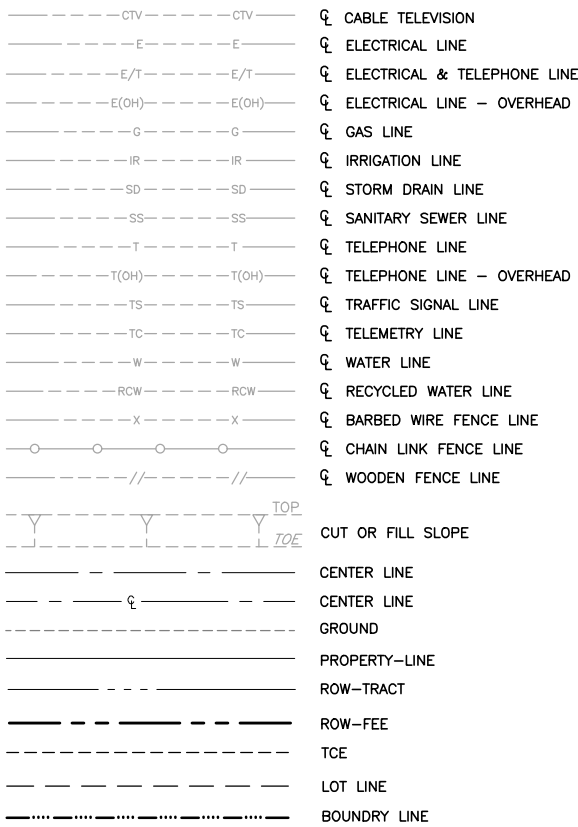
* IF SECTION OR DETAIL APPEARS ON THE SAME DRAWING AS THE CALLOUT, THE DRAWING REFERENCE IS REPLACED WITH A DASH (-)



GENERAL LEGEND

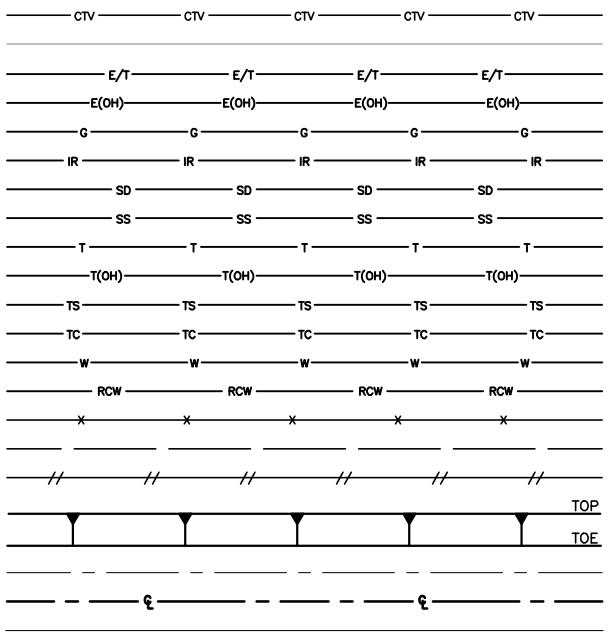


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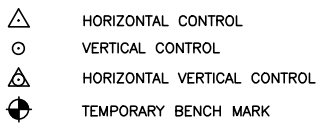
LINE TYPE LEGEND

PROPOSED

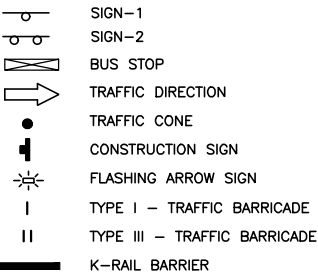


SYMBOLS LEGEND

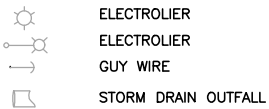
SURVEY



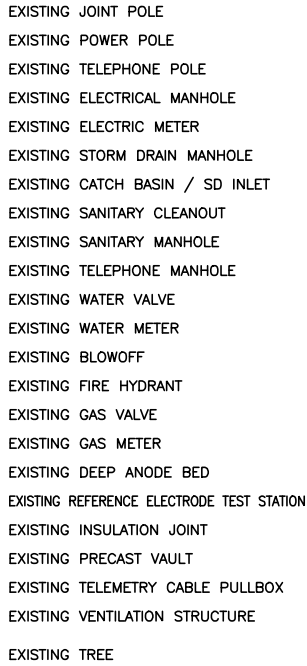
TRAFFIC CONTROL



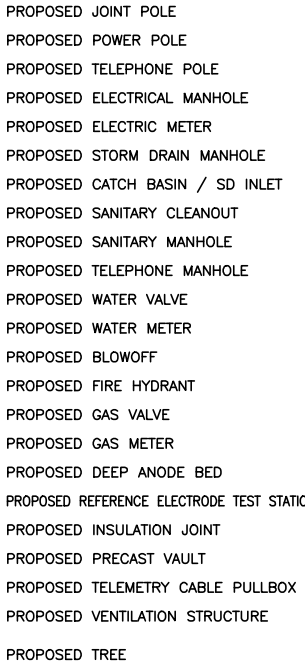
MISCELLANEOUS



EXISTING



PROPOSED



REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES

DATE FEB 2020 DESIGN KCA DRAWN ROO CHECKED KCA	ENGINEERING CERTIFICATION 2/14/2020 ENGINEER	SANTA CLARA VALLEY WATER DISTRICT PROJECT ENGINEER ACCEPTED BY DISTRICT	PROJECT NAME AND SHEET DESCRIPTION: PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS DRAWING INDEX, GENERAL NOTES, AND LEGEND	SCALE AS SHOWN VERIFY SCALES 0 1" BAR IS ON ORIGINAL DRAWING IF THIS SHEET IS USED SCALES ACCORDINGLY	PROJECT NUMBER 91214010 SHEET CODE: G-02 Page 2 of 484 2 OF 14

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DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXXX

ABBREVIATIONS

& ∠ ± @ ⊕ Δ ° = ' > * ∅ < # %	AND ANGLE APPROXIMATELY AT CENTERLINE DEFLECTION DEGREE EQUALS FOOT GREATER THAN INCH PHASE LESS THAN NUMBER PERCENT	CFM CFS CH CHAN CHEM CHKD CI CIP CIRC CIRCUM CISP CKT CL, ∅ CL2 CLASS CLG CLOS CLR CM 3 CM 2 CM CMC CML CML&C CMP CMU CNTR CNTRSK CO CO2 COD COL COMM COMP CONC COND CONN CONST CONST JT,CJ CONT CONTR COORD COR CORR COUP,CPLG CP CPVC C/S, CS CT CTR CTS CV CW CY	CUBIC FEET PER MINUTE CUBIC FEET PER SECOND CHAMBER CHANNEL CHEMI (-CAL,-STRY) CHECKERED CAST IRON CAST IRON PIPE CIRCULA(-R,-TION) CIRCUMFERENCE CAST IRON SOIL PIPE CIRCUIT CENTERLINE CHLORINE CLASSIFICATION CEILING CLOSET CLEAR (-ANCE) CUBIC CENTIMETER SQUARE CENTIMETER CENTIMETER CEMENT MORTAR COATED CEMENT MORTAR LINED CEMENT MORTAR LINED & COATED CORRUGATED METAL PIPE CONCRETE MASONRY UNIT(-S) COUNTER COUNTERSUNK CLEANOUT CARBON DIOXIDE CHEMICAL OXYGEN DEMAND COLUMN COMMUNICATION COMPRESSOR CONCRETE CONDENSATE CONNECT (-S,-ION) CONSTRUCT (-ION) CONSTRUCTION JOINT CONTINU (-ED,-OUS,-ATION) CONTRACTOR COORDINATE CORNER CORRUGATED COUPLING CONTROL PANEL CHLORINATED POLYVINYL CHLORIDE CONSTANT SPEED COURT CENTER CATHODIC TEST STATION CHECK VALVE COLD WATER CUBIC YARD	EMERG ENCL ENGR ENTR EP EPA EQ EQUIP EST ETC EXC EXH EXIST, E EXP EXP JT EXT EW °F FT FA FAI FC FCA FCO FD FDC FE FE FH FL FM FRC FRP FAB FAC FACIL FACP FIG FILT FIN FIN GD FLASH FLEX FLG FLR FLUOR FDN FREQ FS FT 2 FTG FUT, F FWD GA GAL GALV GASO GC GDL GEN GENL GL GLV GND GPD GPH GPM GR GRL GS GV GYP BD H HB HDPE HGL HGR HGT, HT HM HORIZ HPT, HP HR	EMERGENCY ENCLOSURE ENGINEER ENTRANCE EDGE OF PAVEMENT ENVIRONMENTAL PROTECTION AGENCY EQUAL (-LY) EQUIPMENT ESTIMATE (-D) ET CETERA EXCAVATE EXHAUSTER (-S) EXISTING EXPANSION EXPANSION JOINT EXTERIOR EACH WAY DEGREE FAHRENHEIT FEET, FOOT FIRE ALARM FRESH AIR INTAKE FLEXIBLE COUPLING FLANGED COUPLING ADAPTER FLOOR CLEANOUT FLOOR DRAIN FIRE DEPARTMENT CONNECTION FIRE EXTINGUISHER FAR FACE, FINISH FLOOR FIRE HYDRANT FLOW LINE FLOW METER FLEXIBLE RUBBER COUPLING FIBERGLASS REINFORCED PLASTIC FABRICATE(-D) FACTORY FACILITY (-IES) FIRE ALARM CONTROL PANEL FIGURE FILTER FINISH(-ED) FINISH GRADE FLASHING FLEXIBLE FLANGE(-D) FLOOR FLUORESCENT FOUNDATION FREQUENCY FIRE SERVICE SQUARE FEET FOOTING FUTURE FORWARD GAUGE GALLON (-S) GALVANIZE(-D) GASOLINE GROOVED COUPLING GROUND LEVEL GENERATOR GENERAL GLASS GLOBE VALVE GROUND GALLONS PER DAY GALLONS PER HOUR GALLONS PER MINUTE GRAM GUARDRAIL GALVANIZED STEEL GATE VALVE GYPSUM BOARD HIGH HOSEBIB HIGH DENSITY POLYETHYLENE HYDRAULIC GRADE LINE HANGER HEIGHT HOLLOW METAL HORIZONTAL HIGH POINT HOUR	HRL HTR HV HVAC HVOS HW HWL HWY HYD HZ I & C ID IE IF IN 2 IN INFL, INF INSTR INSUL INT INV IPS JB, J-BOX KG Km KV KVA KW L LAB LAM LAT LAV LB L/D LDG LE LEL LF LG LGT LIQ LL LLV LOC LONG LP LPG LS LTG LWL M M 3 M 2 MACH MATL MAX MB MCC MECH MET MFR MG MGD MG/L MH MIL MIN MISC MJ ML MM MODIF MON MPH MT MTD MTG MTR	HANDRAIL HEATER HYDRAULIC VALVE HEATING, VENTILATING & AIR CONDITIONING HYDRAULIC VALVE OIL SUPPLY HOT WATER HIGH WATER LEVEL HIGHWAY HYDRAULIC HERTZ INSTRUMENTATION AND CONTROLS INSIDE DIAMETER INVERT ELEVATION INSIDE FACE SQUARE INCHES INCH (-ES) INFLUENT INSTRUMENT INSULAT(-E,-ION) INTERIOR INVERT INTERNATIONAL PIPE STANDARD JUNCTION BOX KILOGRAM; KNIFE GATE KILOMETER KILOVOLTS KILOVOLT-AMPERES KILOWATT LENGTH; LITER LABORATORY LAMINATE LATERAL LAVATORY POUND(-S) LITERS PER DAY LANDING LIFTING EYE LOWER EXPLOSION LIMIT LINEAR FEET LONG LIGHT LIQUID LIVE LOAD LONG LEG VERTICAL LOCATION LONGITUDINAL LOW POINT LIQUIFIED PETROLEUM GAS (PROPANE OR BUTANE AS NOTED) LIMIT SWITCH LIGHTING LOW WATER LEVEL METER, MODIF (-Y, -IED) CUBIC METERS SQUARE METERS MACHINE MATERIAL MAXIMUM MACHINE BOLT MOTOR CONTROL CENTER MECHANICAL METAL MANUFACTURER MILLIGRAMS, MILLION GALLONS MILLION GALLONS PER DAY MILLIGRAMS PER LITER MANHOLE 1/1000 INCH MINIMUM; MINUTE MISCELLANEOUS MECHANICAL JOINT MILLILITER(-S) MILLIMETER(-S) MODIFICATION(-S) MONUMENT MILES PER HOUR MOUNT MOUNTED MOUNTING MOTOR	N (N) N/A NAT G, NG NC NE NEUT NF NGVD NO NOM NRS NT NTS NV NW OA OBD OC O/C OD OF OFF OFS OH OL OPNG OPP ORIG OSHA OZ P PIPE PC PCF PCO PE PE, POLY PEN. PERF PF PG PH PI P & ID PIV PL, P/L PL, P PLAS PLY PNL PP PPP PPB PPM PR PRESS PRFV PRV PRI PROJ PROP PROT PRS PRV PS PSF PSI PSIA PSIG PSL PSTA PSW PT PV PVC	NORTH NEW NOT APPLICABLE NATURAL GAS NORMALLY CLOSED NORTHEAST NEUTRAL NEAR FACE NATIONAL GEODETIC VERTICAL DATUM NOT IN CONTRACT NORMALLY OPEN, NUMBER NOMINAL NON-RISING STEM (VALVE) NORMALLY THROTTLED NOT TO SCALE NEEDLE VALVE NORTHWEST OVERALL OPPOSED BLADE DAMPER ON CENTER OPEN/CLOSE SERVICE OUTSIDE DIAMETER OUTSIDE FACE, OVERFLOW OFFICE OUTSIDE FACE OF STUD OVERHEAD OVERLOAD OPENING OPPOSITE ORIGINAL OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION OUNCE(-S) PIPE PIECE POUNDS PER CUBIC FEET PRESSURE CLEANOUT PLAIN END POLYETHYLENE PENETRATION PERFORAT(-E, -ED, -ES, -ATION) PROFILE PRESSURE GAUGE PIPE HANGER POINT OF HORIZONTAL INTERSECTION PROCESS (OR PIPING) & INSTRUMENTATION DIAGRAM POST INDICATOR VALVE PROPERTY LINE PLATE PLASTER PLYWOOD PANEL PAGES, PERSONEL PROTECTION, POWER POLE PACHECO PUMPING PLANT PARTS PER BILLION PARTS PER MILLION PAIR, PULL RING PRESSURE PRESSURE RELIEF VALVE PRESSURE REDUCING VALVE PRIMARY PROJECT(-ION) PROPERTY PROTECTOR PRESSURE SNUBBER PRESSURE REDUCING VALVE PIPE SUPPORT POUNDS PER SQUARE FEET POUNDS PER SQUARE INCH POUNDS PER SQUARE INCH ABSOLUTE (PRESSURE ABOVE VACUUM) POUNDS PER SQUARE INCH-GAUGE (PRESSURE ABOVE ATMOSPHERE) PIPE SLEEVE PUMP STATION PRESSURE SWITCH POINT PLUG VALVE POINT OF VERTICAL CURVE, POLYNIYL CHLORIDE	PVMT PWR Q R R, RAD RC RCP RD REC RECIRC RED REF REFR REG REINF REL REQD REQT RES, RSVR REV RH RM RWD R/W RTN RTE RT RR RPS RPM RND S SAN SCFM SCHD, SCH SD SE SEC SECT SEW SHT, SH SI SIG SIM SL SO 2 SP SPC SPCD SPCNG SPCS SPEC SQ SQ FT, SF SQ IN SS SS 304 SS 316 ST STA STD STIFF STL STM STN STOR STRUCT SUB SUPP SURF SUSP SV SW SWBD SWHP SW SWGR SYM	PAVEMENT POWER FLOW OR DISCHARGE RISER RADIUS REINFORCED CONCRETE REINFORCED CONCRETE PIPE ROAD RECEIVING RECIRCULAT(-E, -ION) REDUCE(-R) REFERENCE REFRIGERATOR REGULAT(-E, -OR, -ION, -ING) REINFORC(-E, -ED, -ING, -MENT) RELATIVE REQUIRED REQUIREMENT RESERVOIR REVISION RIGHT HAND ROOM REDWOOD RIGHT-OF-WAY RETURN ROUTE RIGHT RAILROAD REVOLUTIONS PER SECOND REVOLUTIONS PER MINUTE ROUND SOUTH; SLOPE SANITARY STANDARD CUBIC FEET PER MINUTE SCHEDULE STORM DRAIN SOUTHEAST SECOND(-S, -ARTY) SECTION(-S) SEWER SHEET SIDEWALK INLET SIGNAL SIMILAR SLUDGE SULFUR DIOXIDE STATIC PRESSURE SPACE SPACED SPACING SPACES SPECIFICATIONS SQUARE SQUARE FEET SQUARE INCHES SANITARY SEWER STAINLESS STEEL TYPE 304 STAINLESS STEEL TYPE 316 STREET STATION STANDARD STIFFEN (-ER) STEEL STEAM STAINLESS STORAGE STRUCTUR(-E, -AL) SUBNATANT SUPPORT(-S) SURFACE SUSPEND(-ED) SOLENOID VALVE SOUTHWEST; SWITCH SWITCHBOARD SERVICE WATER, HIGH PRESSURE SIDEWALK SWITCHGEAR SYMMETRICAL	T T/ TB TBM T & B TC TDH TEL, TELE TEMP TEMPY TERM T & G THK TOC TOP TOPO TOS TOW T___S T___P TYP TS, T'STAT TRANSV TRANSF T-R TR TP UG UGE UH UPR V VAC VAR VAT VC VCP VEL VERT VERTS VEST VOL VPI V/S, VS VT W W/ WAPA WC W CL WD WH WM W/O WP WS WST WT WTR WW WWF WWM	TIMER; TIME TOP OF THRUST BLOCK TEMPORARY BENCH MARK TOP & BOTTOM TOP OF CURB TOTAL DYNAMIC HEAD TELEPHONE TEMPERATURE TEMPORARY TERMINAL; TERMINATION TONGUE & GROOVE THICK(-ENED, -ENER, -NESS) TOP OF CONCRETE TOP OF PAVEMENT TOPOGRAPHY TOPOGRAPHY TOP OF STEEL; TOP OF SLAB TOP OF WALL TYPE ___ SUPPORT TYPE ___ PIPE TYPICAL THERMOSTAT TRANSVERSE TRANSFORMER THROUGH ROOF TREAD(-S) TELEPHONE POLE UNDERGROUND UNDERGROUND ELECTRIC UNIT HEATER UPPER VOLT VACUUM VARIABLE VINYL ASBESTOS TILE VERTICAL CURVE VITRIFIED CLAY PIPE VELOCITY VERTICAL VERTICAL BARS VESTIBULE VOLUME VERTICAL POINT OF INTERSECTION VARIABLE SPEED VENT WIDTH; WIDE; WEST WITH WESTERN AREA POWER ADMINISTRATION WATER CLOSET WATER COLUMN WOOD WATER HEATER WATER METER WITHOUT WEATHERPROOF WELDED STEEL WATERSTOP WEIGHT WATER WATER WASTE WELDED WIRE FABRIC WELDED WIRE MESH

REV

DESCRIPTION

DATE

APPR.

REFERENCE INFORMATION AND NOTES

KJ

Kennedy Jenks

303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107

DATE

FEB 2020

DESIGN

KCA

DRAWN

ROO

CHECKED

KCA

ENGINEERING CERTIFICATION

REGISTERED PROFESSIONAL ENGINEER

KEVIN C. ALLEN

No. C85186

Exp. 9/30/21

CIVIL

STATE OF CALIFORNIA

2/14/2020

ENGINEER

DATE

SANTA CLARA VALLEY WATER DISTRICT

Valley Water

PROJECT ENGINEER

ACCEPTED BY DISTRICT

DATE

PROJECT NAME AND SHEET DESCRIPTION:

PACHECO PUMPING PLANT

PRIORITY 1 FIRE PROTECTION

IMPROVEMENTS

ABBREVIATIONS

SCALE

AS SHOWN

VERIFY SCALES

0 1"

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PROJECT NUMBER

91214010

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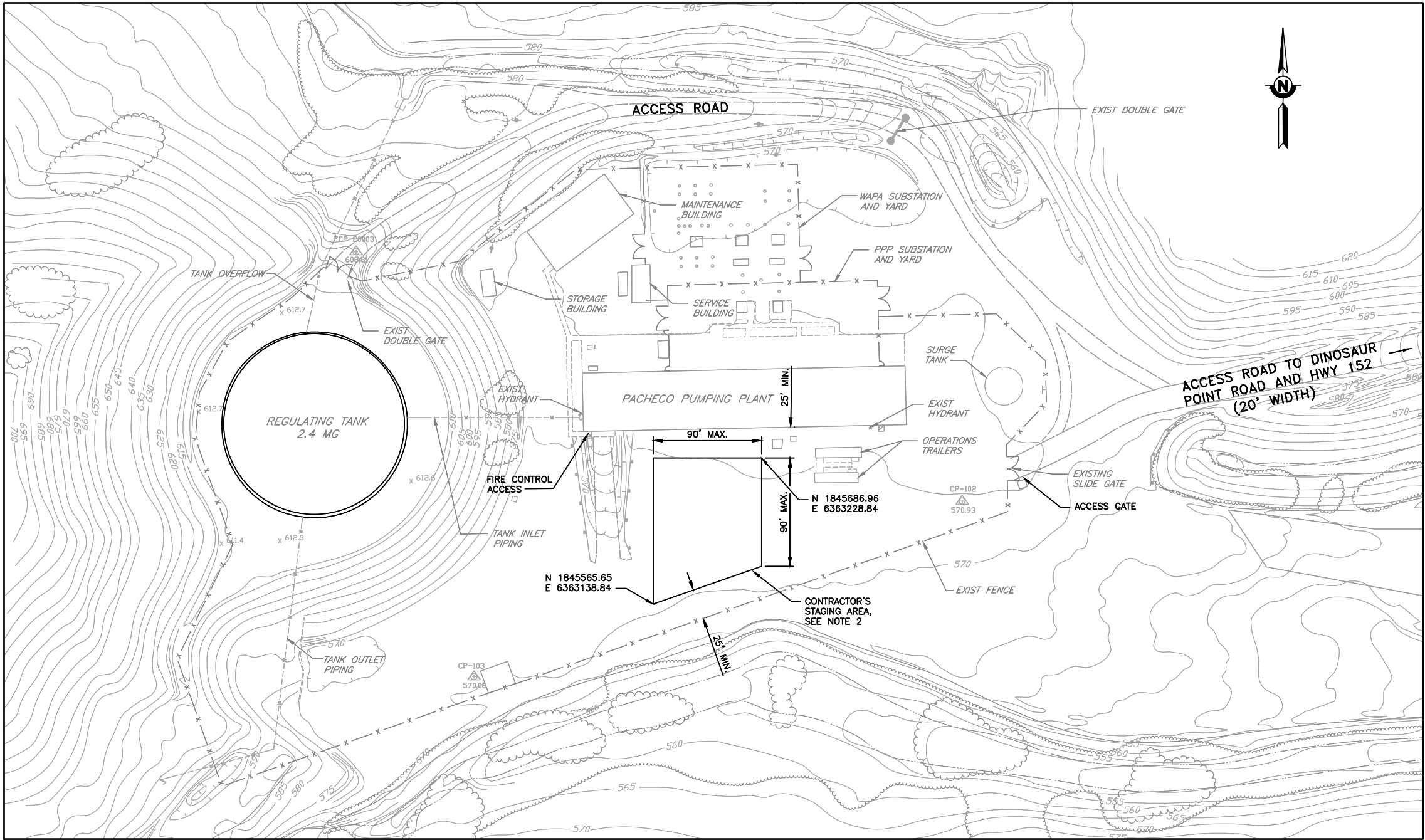
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Page 273 of 484

3 OF 14

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FILENAME: \\KJC\KJC-Root\KJ-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\G-04.dwg

DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXX



- GENERAL NOTES:
1. UNLESS OTHERWISE INDICATED, ALL EXISTING UTILITIES AND FACILITIES SHALL BE MAINTAINED IN PLACE AND IN OPERATION AT ALL TIMES.
 2. TEMPORARY CHAIN LINK FENCING AND GATE SHALL BE INSTALLED TO ENCLOSE THE STAGING AREA DURING THE PROJECT WORK AND REMOVED AFTER THE PROJECT IS COMPLETED.

SITE PLAN AND SITE ACCESS

SCALE: 1"=50'

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES



Kennedy Jenks
303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107

DATE
FEB 2020
DESIGN
KCA
DRAWN
ROO
CHECKED
KCA

ENGINEERING CERTIFICATION


2/14/2020
ENGINEER DATE

SANTA CLARA VALLEY WATER DISTRICT


PROJECT ENGINEER ACCEPTED BY DISTRICT DATE

PROJECT NAME AND SHEET DESCRIPTION:
**PACHECO PUMPING PLANT
PRIORITY 1 FIRE PROTECTION
IMPROVEMENTS**
SITE PLAN AND SITE ACCESS

SCALE
AS SHOWN
VERIFY SCALES
0 1"
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IF THIS SHEET DOES NOT MATCH SCALES ACCORDINGLY

PROJECT NUMBER
91214010
SHEET CODE:
G-04
Page 4 of 484
4 OF 14



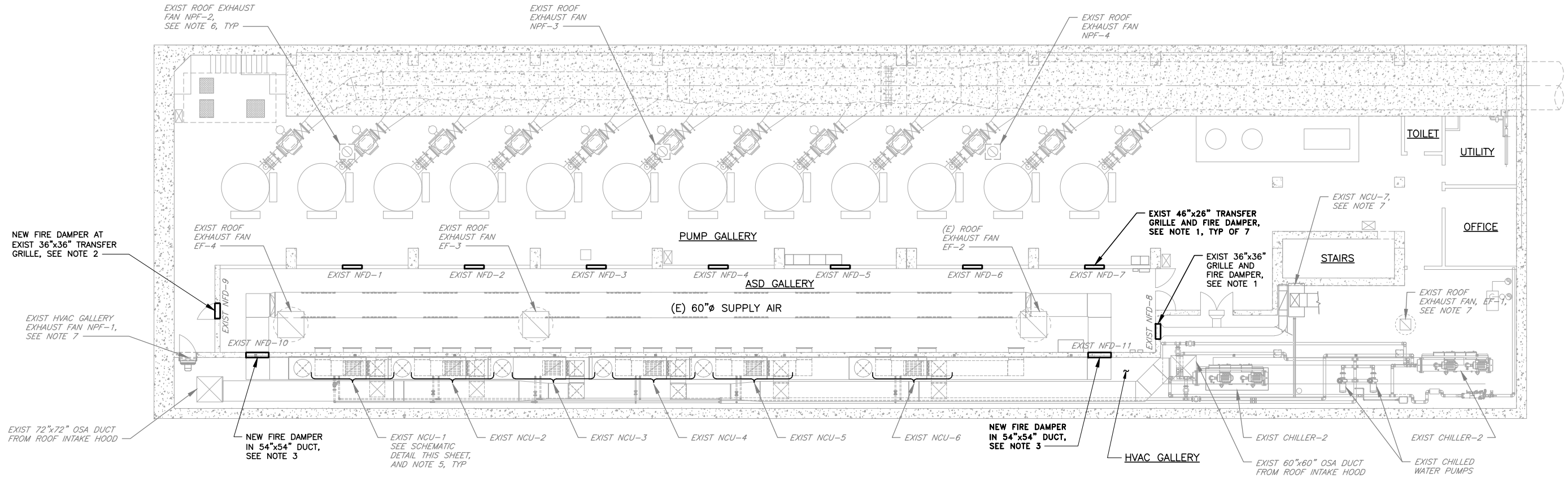
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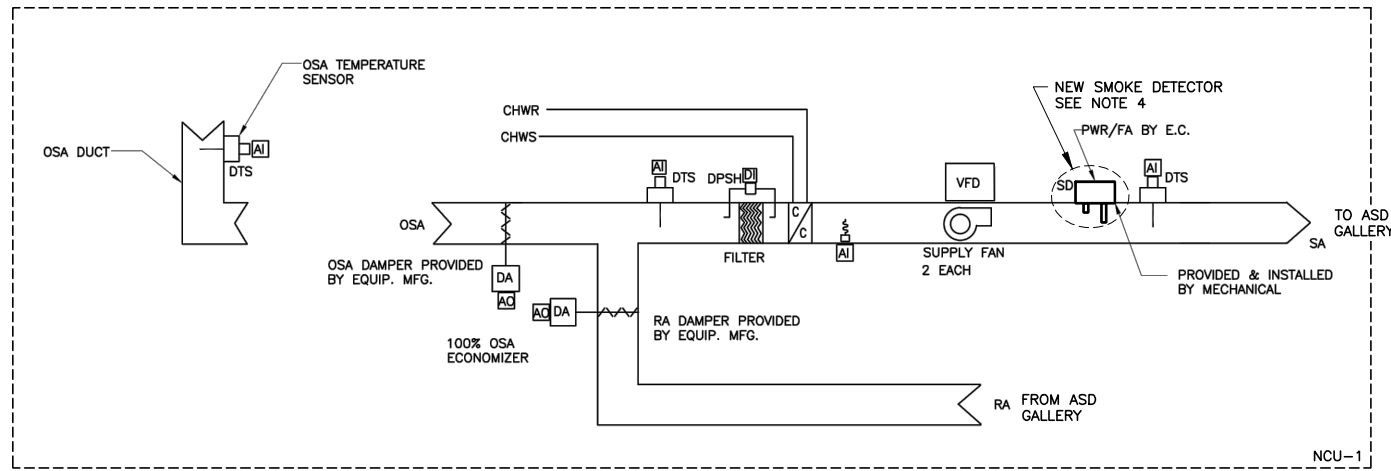
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DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXX



PLAN AT ELEVATION 548.50
SCALE: 3/32" = 1'-0"



NCU DIAGRAM
SCALE: NTS

NOTES:

1. REMOVE EXISTING CURTAIN DAMPER ASSEMBLY AND LATCH SYSTEM FOR DAMPERS NFD-1 THROUGH NFD-8 IN THE ASD GALLERY. INSTALL "FLANGE-MOUNT", MULTI-BLADE FIRE/SMOKE DAMPER WITH MOTOR ACTUATOR ON INTERIOR WALL OF ASD GALLERY OVER WALL/GRILLE OPENING.
2. INSTALL "FLANGE-MOUNT", MULTI-BLADE FIRE/SMOKE DAMPER WITH MOTOR ACTUATOR ON INTERIOR WALL OF ASD GALLERY OVER WALL/GRILLE OPENING.
3. INSTALL "SLEEVE-TYPE" MULTI-BLADE FIRE/SMOKE DAMPER WITH MOTOR ACTUATOR AT SUPPLY DUCT ENTRY INTO ASD GALLERY. DEMOLISH DUCTWORK AS NEEDED FOR DAMPER INSTALLATION. REPLACE USING MATERIALS SPECIFIED IN SECTION 32.05. PROVIDE DUCT ACCESS DOOR TO ACCESS DAMPER ACTUATOR AND CONTROLS.
4. INSTALL NEW SMOKE DETECTORS TO REPLACE EXISTING. SEND SIGNAL TO NEW FIRE ALARM PANEL. SEE ELECTRICAL DRAWING.
5. EXHAUST FANS EF-2, EF-3, EF-4 AND COOLING UNITS NCU-1 THROUGH NCU-6 SERVING THE ASD GALLERY SHALL ALL BE INTERLOCKED TO SHUT DOWN ON ACTUATION OF CLEAN AGENT SYSTEM. THERE ARE NO MODIFICATIONS TO THE TEMPERATURE CONTROLS FOR THESE UNITS.
6. THERE ARE NO MODIFICATIONS TO THE TEMPERATURE CONTROLS FOR THE THREE EXISTING ROOFTOP FAN INSTALLATIONS, NPF-2, NPF-3, NPF-4 AND THE 18 EXISTING MOTORIZED DAMPER INSTALLATIONS NDM-10 THROUGH NDM-27 IN THE ATRIUM SPACE OF THE PUMP GALLERY.
7. THERE ARE NO MODIFICATIONS TO THE TEMPERATURE CONTROLS FOR THE EXHAUST FANS NPF-1 AND EF-1 AND COOLING UNIT NCU-7 SERVING THE MECHANICAL EQUIPMENT ROOM.

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES

Kennedy Jenks
303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107

DATE
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2/14/2020
ENGINEER

SANTA CLARA VALLEY WATER DISTRICT

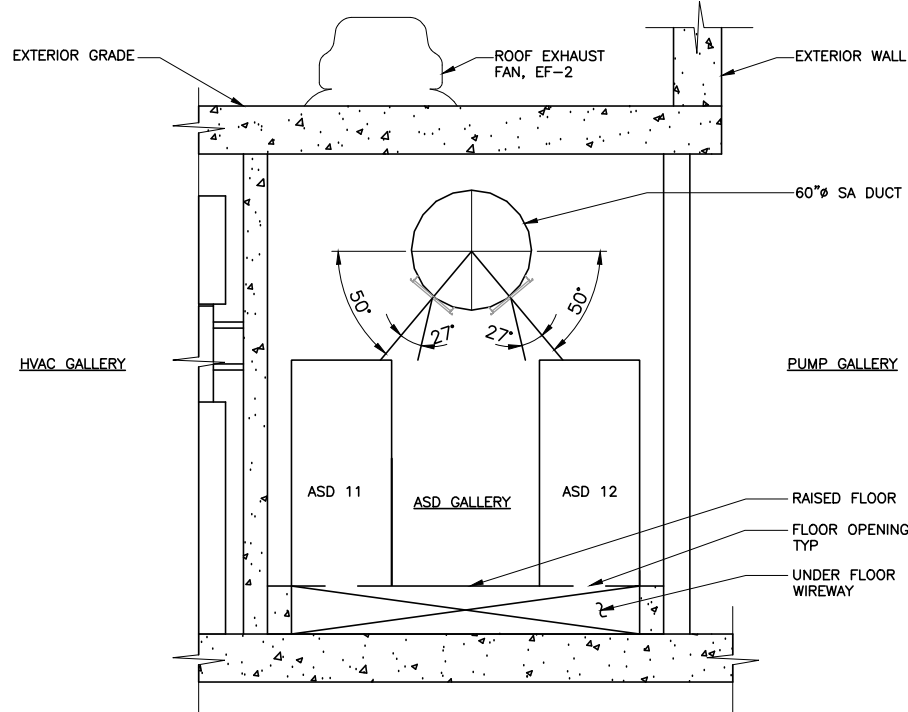
PROJECT ENGINEER
ACCEPTED BY DISTRICT

PROJECT NAME AND SHEET DESCRIPTION:
**PACHECO PUMPING PLANT
PRIORITY 1 FIRE PROTECTION
IMPROVEMENTS
HVAC MODIFICATIONS**

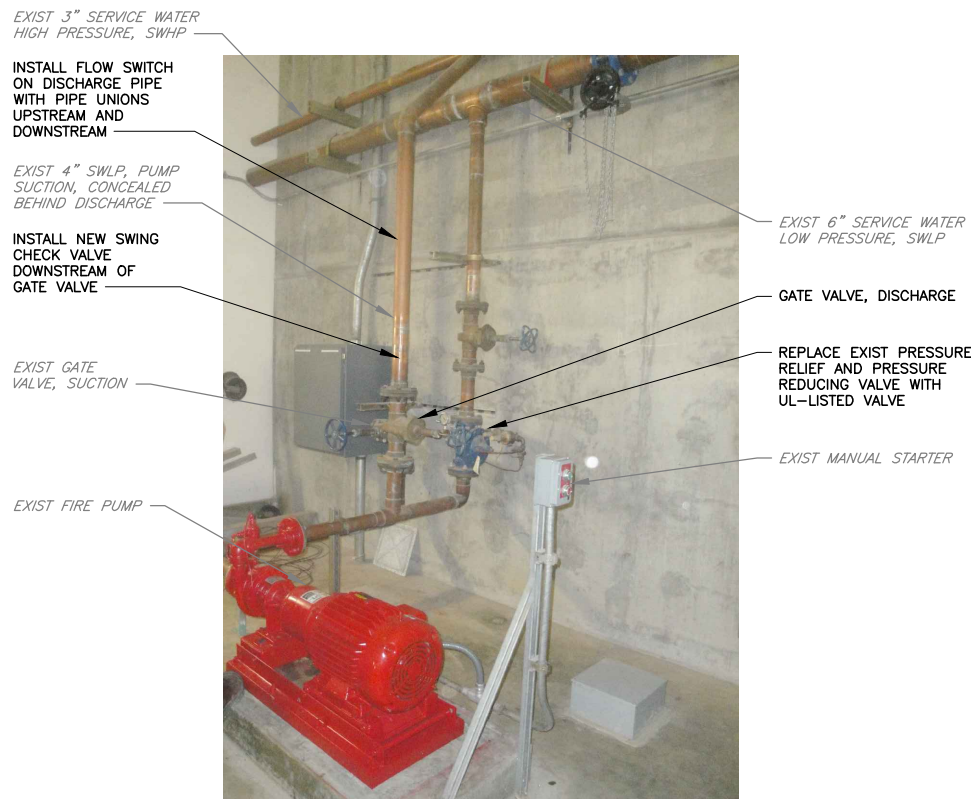
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PROJECT NUMBER
91214010
SHEET CODE:
M-02
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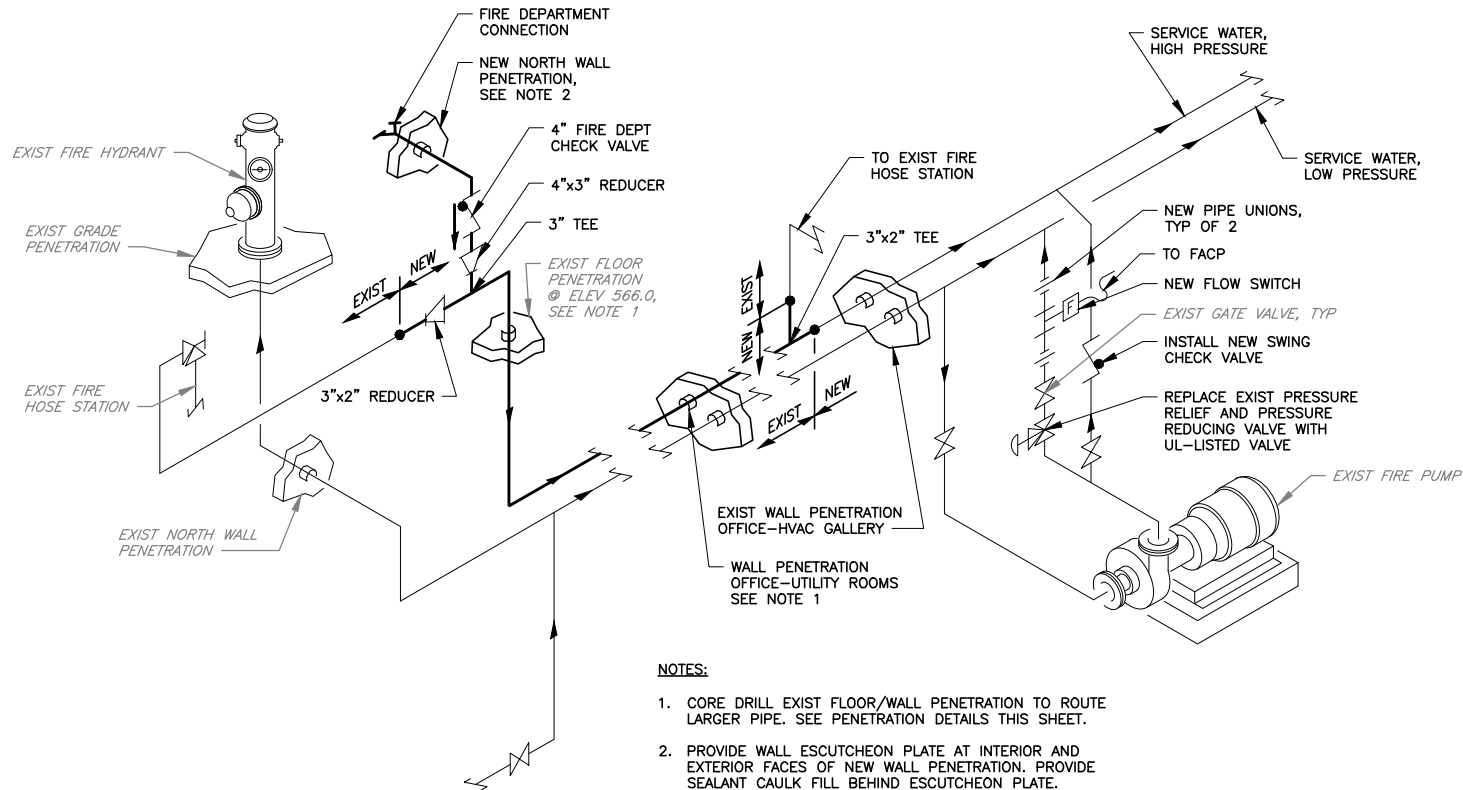
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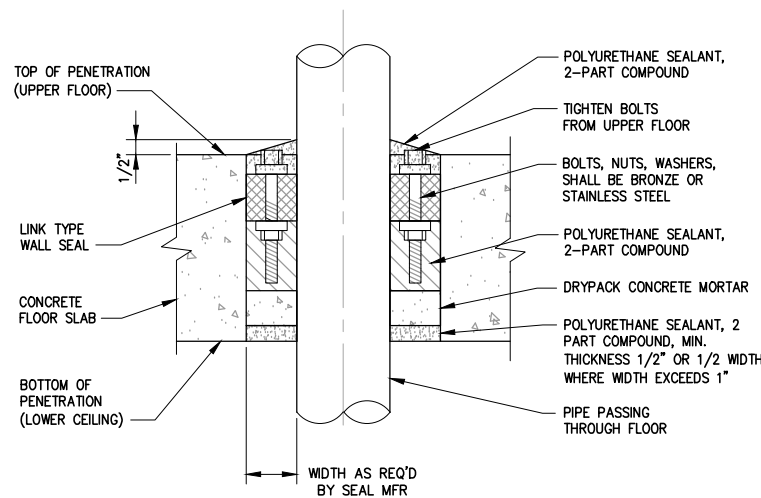
SECTION **A** ASD GALLERY
M-1 SECTION AT ASD GALLERY
SCALE: 1/4" = 1'-0"



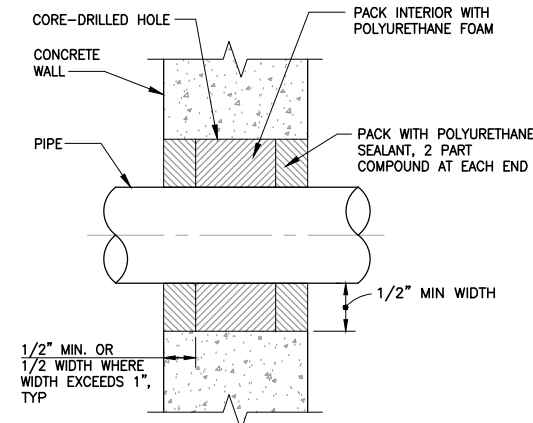
FIRE PUMP MODIFICATIONS
SCALE: NTS



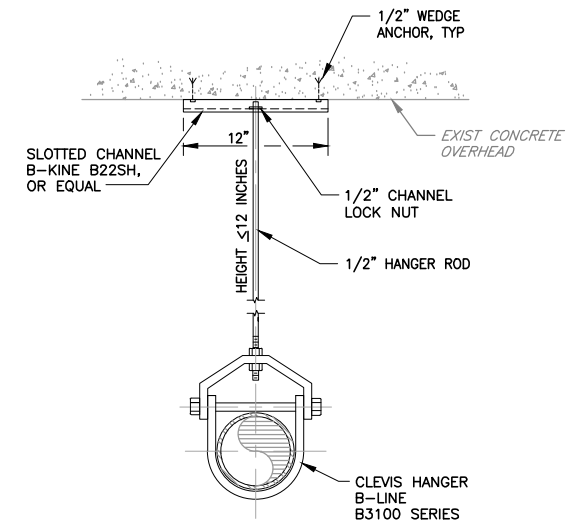
SERVICE WATER ISOMETRIC
SCALE: NTS



DETAIL **1** LINK-SEAL FLOOR
PENETRATION DETAIL
SCALE: NTS



DETAIL **2** WALL PENETRATION
SCALE: NTS



CEILING HANGER - CLEAN AGENT PIPING SYSTEM
DETAIL **3** TYPE 4 SUPPORT, T4S
SCALE: NTS

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES

Kennedy Jenks
303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107

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ENGINEERING CERTIFICATION

2/14/2020
ENGINEER

SANTA CLARA VALLEY WATER DISTRICT

PROJECT ENGINEER
ACCEPTED BY DISTRICT

PROJECT NAME AND SHEET DESCRIPTION:
**PACHECO PUMPING PLANT
PRIORITY 1 FIRE PROTECTION
IMPROVEMENTS**
SYSTEM SCHEMATIC, SECTION, AND DETAILS

SCALE
AS SHOWN
VERIFY SCALES
0 1"
BAR IS ON ORIGINAL
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SCALE ACCORDINGLY

PROJECT NUMBER
91214010
SHEET CODE:
M-03
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USERNAME: Jeonrl 2/14/2020 1:01~PM
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DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXXX

ABBREVIATIONS

GENERAL PROPOSE ABBREVIATIONS, OTHER THAN THOSE LISTED BELOW, CONFORM TO ANSI/ASME Y1.1

A	AMPERE	I	INSTANTANEOUS	SA	SURGE ARRESTER
AC	ALTERNATING CURRENT	IC	INTERRUPTING CAPACITY	SD	SHUTDOWN
AF	AMPS-FRAME	IOR	I/O RACK	SM	SURFACE MOUNT
AFF	ABOVE FINISHED FLOOR	IR	INFRARED	SPDT	SINGLE POLE, DOUBLE THROW SPECIFICATIONS
AFG	ABOVE FINISHED GRADE	ISR	INTRINSICALLY SAFE RELAY	SPST	SINGLE POLE, SINGLE THROW
AIC	AVAILABLE INTERRUPTING CURRENT	IST	INSTANTANEOUS BREAKER TRIP	SSCC	STATION SERVICE CONTROL CENTER
AL	ALUMINUM			SST	STAINLESS STEEL
AM	AMMETER	JB	JUNCTION BOX	ST	SHORT TIME
ASD	ADJUSTABLE SPEED DRIVE	KVA	KILOVOLTS	STP	SHIELDED TWISTED PAIR
AT	AMPS-TRIP	KVAR	KILOVOLT AMPERES	SWBD	SWITCHBOARD
ATS	AUTOMATIC TRANSFER SWITCH	KW	KILOWATT	SWGR	SWITCHGEAR
AUTO	AUTOMATIC	KWH	KILOWATT HOUR	SYMM	SYMMETRICAL
AWG	AMERICAN WIRE GAUGE				
BC	BARE COPPER	LCL	LONG CONTINUOUS LOAD	TB	TEST BLOCK
BCP	BACKUP CONTROL PANEL	LCP	LOCAL CONTROL PANEL	TDR	TIME DELAY RELAY
BRKR	BREAKER	LES	LOCAL EMERGENCY STOP	TEL	TELEPHONE
BSC	BARE STRANDED COPPER	LOR	LOCAL-OFF-REMOTE SWITCH	THWN	THERM PLASTIC, HEAT RESISTANT, WATERPROOF, NYLON COATED
		LOS	LOCK-OUT STOP PUSH BUTTON	TRANSF	TRANSFORMER
C	CONDUIT	LP	LIGHTING PANEL	TS	TEMPERATURE SWITCH
CAT	CATALOG	LRA	LOCKED ROTOR AMPS	TSP	TESTED SHIELDED PAIR
CB	CIRCUIT BREAKER	LS	LIMIT SWITCH	TTB	TELEPHONE TERMINAL
CKT	CIRCUIT	LSG	LONG TIME, SHORT TIME, GROUND FAULT TRIP ON CIRCUIT BREAKER	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
CO	CONDUIT ONLY			TYP	TYPICAL
CONN	CONNECTED	LTG	LIGHTING		
CO	CONTROL PANEL	LV	LOW VOLTAGE	UCP	UNIT CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER	MA	MILLIAMPERE	UG	UNDERGROUND
CT	CURRENT TRANSFORMER	MAX	MAXIMUM	UL	UNDERWRITERS LABS
CU	COPPER	MCC	MOTOR CONTROL CENTER	UNO	UNLESS NOTED OTHERWISE
DDC	DIRECT DIGITAL CONTROL	MCE	MOTOR CONTROL EQUIPMENT	UPS	UNINTERRUPTIBLE POWER SYSTEM
DIA	DIAMETER	MCM	THOUSAND CIRCULAR MILS	UTP	UNSHIELDED TWISTED PAIR
DISC	DISCONNECT	MCP	MAIN CONTROL PANEL	V	VOLTS
DISTRIB	DISTRIBUTION	MF	MEDIUM FLOW MANUFACTURER	VA	VOLT AMPS
DIV	DIVISION	MFGR	MANUFACTURER	VAC	VOLTAGE AC
DPDT	DOUBLE POLE,DOUBLE THROW	MIC	MANUFACTURE'S I INTERCONNECTING CABLE	VD	VOLTAGE DROP
DS	DOOR SWITCH	MIN	MINIMUM	VDC	VOLTS DC
DWG	DRAWING	MISC	MISCELLANEOUS	VFD	VARIABLE FREQUENCY DRIVE
EA	EACH	MLO	MAIN LUGS ONLY	VIB	VIBRATION SYSTEM
EF	EXHAUST FAN	MMI	MAN-MADE INTERFACE	VM	VOLTMETER
ELECT	ELECTRICAL	MOV	MOTOR OPERATED VALVE	VSH	VIBRATION SWITCH, HIGH(WARNING)
ELEV	ELEVATION	MPR	MOTOR PROTECTION RELAY	VSHH	VIBRATION SWITCH, HIGH HIGH(SHUTDOWN)
EMERG	EMERGENCY	MS	MAGNETIC STARTER	VR	VOLTAGE REGULATOR
EQUIP	EQUIPMENT	MSH	MOTOR SPACE HEATER	W	WIRE/WATTS
EST	ESTIMATED	MTG	MOUNTING	WAPA	WESTERN AREA POWER ADMINISTRATION
ETM	ELAPSED TIME METER	MTS	MANUAL TRANSFER SWITCH	WP	WEATHERPROOF
EXIST	EXISTING	MV	MEDIUM VOLTAGE	WT	WATERTIGHT
		NA	NOT APPLICABLE	WTH	WEATHER STATION
FA	FIRE ALARM	NC	NORMALLY CLOSED	XFMR	TRANSFORMER
FB	FEEDER BREAKER	NEC	NATIONAL ELECTRICAL CODE	Z	IMPEDANCE
FLA	FULL LOAD AMPS	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION	3P	THREE POLE
FRP	FIBERGLASS REINFORCED PLASTIC			3W	THREE WIRE
FS	FLOW SWITCH	NIC	NOT IN CONTRACT	4W	FOUR WIRE
FVR	FULL VOLTAGE REVERSING	NO	NUMBER	#	POUND, NUMBER
FVNR FULL	VOLTAGE NON-RESERVING	N/P	NAMEPLATE		
		O/C	(OPEN/CLOSE STATUS)		
GA	GAUGE	OC	ON CENTER		
GEN	GENERATOR	OD	OUTSIDE DIAMETER		
GF	GROUND FAULT	P	POLE		
GFCI	CIRCUIT INTERRUPTER	PB	PULL BOX		
		PC	PHOTO CELL		
GFI	GROUND FAULT INTERRUPTER	PCP	PUMP CONTROL PANEL		
GFT	GROUND FAULT TRIP	PF	POWER FACTOR		
GFW	GROUND FAULT INTERRUPTER, WEATHER PROOF	PFR	POWER FAIL RELAY		
		PH	PHASE		
		PLC	PROGRAMMABLE LOGIC CONTROLLER		
		PM	POWER MOTOR, POWER MONITOR		
HF	HIGH FLOW	PMAP	PUMP MOTOR ASSESSMENT PANEL		
HID	HIGH INTENSITY DISCHARGE	PNL	PANEL		
HOA	HAND-OFF-AUTOMATIC	POC	POINT OF CONNECTION		
HP	HORSEPOWER	PPP	PACHECO PUMP PLANT		
HPF	HIGH POWER FACTOR	PR	PAIR, PROTECTIVE RELAYS		
HPS	HIGH PRESSURE SODIUM	PS	PUMPING STATION		
HVAC	HEATING, VENTILATION AND AIR CONDITIONING	PT	POTENTIAL TRANSFORMER		
		PVC	POLY VINYL CHLORIDE		
		PWR	POWER		
HZ	HERTZ (CYCLES PER SECOND)				
		RECEPT	RECEPTACLE		
		RGS	RIGID GALVANIZED STEEL		
		RMS	ROOT MEAN SQUARE		
		RTD	RESISTANCE TEMPERATURE DEVICE		
		RVAT	REDUCED VOLTAGE AUTO-TRANSFORMER		
		RVSS	REDUCED VOLTAGE SOLID STATE		

NOTE:

1. THIS DRAWING CONTAINS STANDARD SYSMBOLS AND ABBREVIATIONS. NOT ALL SYMBOLS AND ABBEVIATIONS SHOWN ARE USED ON THIS PROJECT.

ELECTRICAL SYMBOLS

SINGLE LINE DIAGRAMS

	UTILITY METERING
	GROUND FAULT INTERRUPTER
	CURRENT TRANSFORMER
	POWER TRANSFORMER
	CONTROL TRANSFORMER
	CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE INDICATED
	SOLID-STATE, REDUCED VOLTAGE MOTOR STARTER WITH FULL-SPEED BY-PASS CONTACTOR
	ADJUSTABLE SPEED DRIVE
	MAGNETIC MOTOR STATER. "1" INDICATES SIZE 1. RV INDICATES REDUCED VOLTAGE. 2S INDICATES 2 SPEED. R INDICATES REVERSING, PW INDICATES PART WINDING.
	COMBINATION MAGNETIC MOTOR STARTER
	MAGNETIC CONTACTOR
	DISCONNECT SWITCH, HEAVY DUTY, RATED 30 AN\MP, 600 VOLT, 3 POLE, NON- FUSED, UNO.
	CONTROL STATION. PUSH-BUTTON STATION OR SELECTOR SWITCH. SEE CONTROL WIRING DIAGRAMS FOR REQUIREMENTS
	AUTOMATIC TRANSFER SWITCH, RATING AS INDICATED.
	STANDBY GENERATOR
	MOTOR, 10 HORSEPOWER
	POWER METER/MONITOR
	CONDUIT NUMBER 12. SEE CONDUIT AND WIRING SCHEDULE FOR SIZES AND QUANTITIES OF CONDUIT AND WIRES.
	GROUND
	LA=LIGHTNING ARRESTER SA=SURGE ARRESTER
	SPECIAL PURPOSE RECEPTACLE, RATING AS INDICATED.
	HASH MARKS INDICATE REMOVAL OR RELOCATION
	INDICATES TO REFER TO NOTE 1 ON DRAWING
	KIRK KEY MECHANICAL INTERLOCK SYSTEM
	MEDIUM VOLTAGE, DRAWOUT CIRCUIT BREAKER

CONTROL WIRING DIAGRAMS

NORMALLY OPEN	NORMALLY CLOSED	DEVICE
		CONTACT
		LIMIT SWITCH.
		PRESSURE OR VACUUM SWITCH.
		LIQUID LEVEL SWITCH
		TEMPERATURE ACTUATED SWITCH
		FLOW SWITCH (AIR, WATER, ETC)
		PUSH BUTTON SINGLE CIRCUIT MOMENTARY CONTACT.
		PUSH BUTTON SINGLE CIRCUIT, LOCK-OUT-STOP (LOCATED AT MOTOR UNLESS OTHERWISE NOTED)
		TIMED CONTACT -CONTACT ACTION RETARDED ON ENERGIZATION
		TIMED CONTACT -CONTACT ACTION RETARDED ON DE-ENERGIZATION
		PILOT LIGHT, Y=YELLOW, R=RED, A=AMBER, B=BROWN, W=WHITE, G=GREEN.
		GROUND
		FUSE
		TWO POSITION SELECTOR SWITCH.
		THREE POSITION SELECTOR SWITCH.
		CONTROL RELAY
		MOTOR STARTER COIL, MS-STARTING MR-RUNNING
		TIME DELAY RELAY. TIMING RANGE AS INDICATED
		MANUAL MOTOR STARTER
		MOTOR STARTER OVERLOAD RELAY CONTACTS
		MOTOR STARTER OVERLOAD AUXILIARY (ALARM) NORMALLY OPEN CONTACT.
		CONTROL POWER TRANSFORMER.
		SOLENOID OPERATED CONTROL VALVE
		120 VOLT, 1 PHASE, MOTOR
		ELAPSED TIME METER
		SPACE HEATER. (LOCATED AT MOTOR UNLESS OTHERWISE NOTED)
		CONTACT OR DEVICE CONNECTED TO TERMINALS
		TERMINALS IN CONTROL EQUIPMENT
		CONTACT OR DEVICE CONNECTED TO TERMINALS
		TERMINALS IN PROGRAMMABLE LOGIC CONTROLLER (PLC)
		INDICATES TO REFER TO NOTE 1
		HASH MARKS INDICATE REMOVAL OR RELOCATION

PLANS

	CONDUIT RUN CONCEALED
	CONDUIT RUN EXPOSED UNLESS OTHERWISE NOTED
	HASH MARKS INDICATE QUANTITY OF #12 WIRES IN CONDUIT (PLUS 1#12 GROUND WIRE) EXCEPT NO HASH MARKS=3/4", 2#12(PUS 1#12 GROUND WIRE) UNLESS NOTED OTHERWISE. SHORT HASURE IS HOT WIRE, LONG HASURE IS NEUTRAL WIRE
	3/4", 3#12
	3/4", 4#12
	3/4", 5#12
	1", 6#12
	1", 7#12
	1", 8#12
	HOMERUN TO PANEL IP, CIRCUITS 1 AND 3 GROUND WIRE, #4/0 OR AS INDICATED
	CONDUIT RUN TURNS AWAY FROM VIEWER (OUT TOP OF EQUIPMENT)
	CONDUIT RUN TURNS TOWARD VIEWER (OUT BOTTOM OF EQUIPMENT)
	CONDUIT STUBBED OUT AND CAPPED
	LIGHTING FIXTURE TYPE A, 100 WATTS. SEE LIGHTING FIXTURE SCHEDULE 8' FROM GRADE
	SINGLE POLE, SINGLE THROW TOGGLE SWITCH
	DOUBLE POLE, SINGLE THROW TOGGLE SWITCH
	THREE-WAY, TOGGLE SWITCH
	FOUR-WAY, TOGGLE SWITCH
	MANUAL MOTOR STARTER
	LIGHTING FIXTURES AND RECEPTACLES SHOWN WITH SUBSCRIPT "o" ADJACENT TO THEM SHALL BE CONTROLLED BY So
	DUPLEX CONVENIENCE RECEPTACLE AT+48" OR AS NOTED
	SINGLE CONVENIENCE RECEPTACLE AT+48" OR AS NOTED
	SPECIAL PURPOSE RECEPTACLE, RATING AS INDICATED.
	STANCHION
	JUNCTION BOX OR CONDUIT FITTING AS APPROPRIATE FOR SITUATION, SIZE AS REQUIRED BY CODE OR AS INDICATED.
	THERMOSTAT OUTLET AT +54"
	CONTROL STATION: PUSHBUTTON OR SELECTOR SWITCH SEE CONTROL WIRING DIAGRAMS FOR REQUIREMENTS.
	MOTOR
	GROUND ROD
	GROUND WELL
	DISCONNECT SWITCH, HEAVY DUTY, RATED 30 AN\MP, 600 VOLT, 3 POLE, NON- FUSED, UNO.
	COMBINATION MAGNETIC MOTOR STARTER
	CKT #XXXXX IN 1" CONDUIT. SEE WIRING SCHEDULE FOR SIZES AND QUANTITIES OF WIRES.
	PROCESS EQUIPMENT OR INSTRUMENTATION DEVICE, SEE PROCESS AND INSTRUMENTATION DRAWINGS FOR DESCRIPTIONS.
	INDICATES TO REFER TO NOTE 1 ON DRAWING
	LAMP
	PUSH BUTTON
	HASH MARKS INDICATE REMOVAL OR RELOCATION
	CONDUIT NOTE

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES

Kennedy Jenks
303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107

ENGINEERING CERTIFICATION
DATE FEB 2020
DESIGN
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DATE 2/14/2020

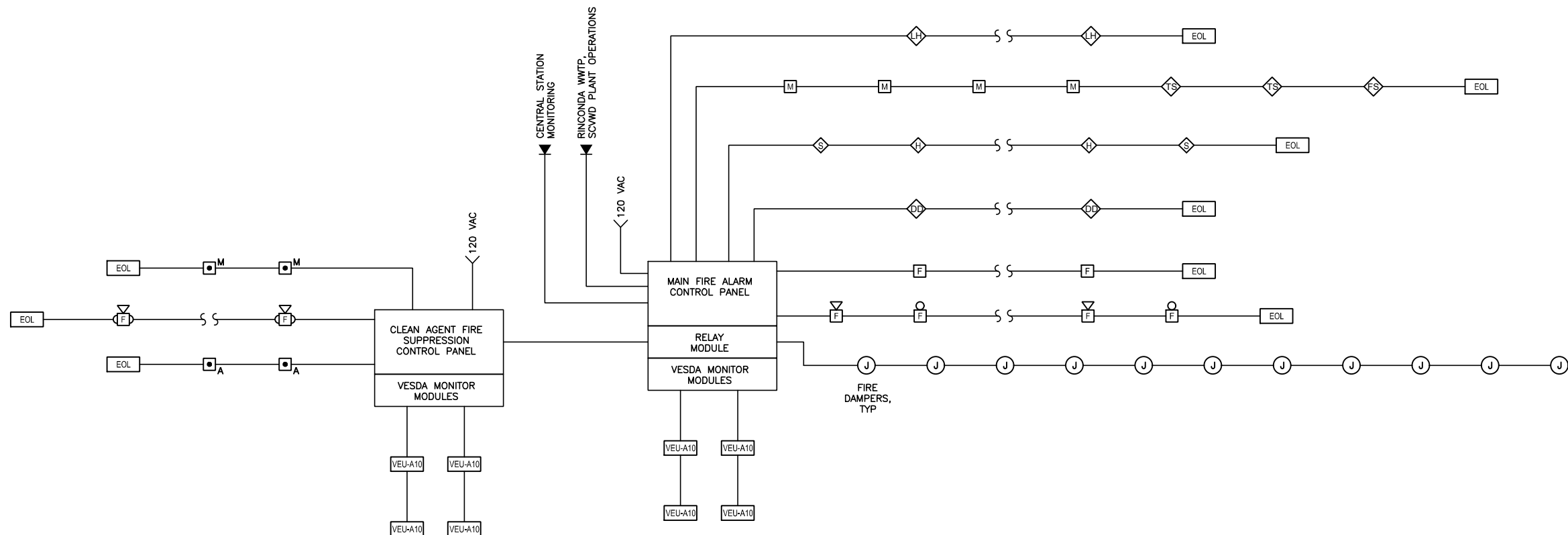
SANTA CLARA VALLEY WATER DISTRICT
Valley Water
PROJECT ENGINEER
ACCEPTED BY DISTRICT
DATE

PROJECT NAME AND SHEET DESCRIPTION:
**PACHECO PUMPING PLANT
PRIORITY 1 FIRE PROTECTION
IMPROVEMENTS**
ABBREVIATIONS, LEGEND AND NOTES

SCALE AS SHOWN	PROJECT NUMBER 91214010
VERIFY SCALES 0 1" BAR IS ON ORIGINAL DRAWING IF THIS SHEET IS NOT SCALES ACCORDINGLY	SHEET CODE: E-Q1 Page 278 of 484 8 OF 14

EXISTING PANEL LPAA									
	120/240 VOLTS, SINGLE PHASE, 3 WIRE	BUS: 100A				MAIN: 100A/2P	MOUNTING: SURFACE		
CKT. NO.	DESCRIPTION	CONNECTED KVA		TRIP AMPS/ POLES	CKT. NO.	DESCRIPTION	CONNECTED KVA		TRIP AMPS/ POLES
		A	B				A	B	
1	RECEPTACLES	(E)		20/2	2	CENTRIFUGAL FAN AND RADIANT HEATER	(E)		15/1
3			(E)		4	ROLLAIR FILTER		(E)	15/1
5	RECEPTACLES	(E)		20/2	6	ROLLAIR FILTER	(E)		15/1
7			(E)		8	CIRCUIT BREAKER LOAD CENTER		(E)	15/2
9	RECEPTACLES	(E)		20/1	10			(E)	
11	SPARE		0.0	20/1	12	MAIN FACP		0.2	15/1
13	PROPELLER FAN	(E)		15/1	14	CLEAN AGENT FSCP	0.2		15/1
15	ELECTRIC TOILET		(E)	15/2	16	SPARE		(E)	15/1
17		(E)			18	SPARE	(E)		15/1
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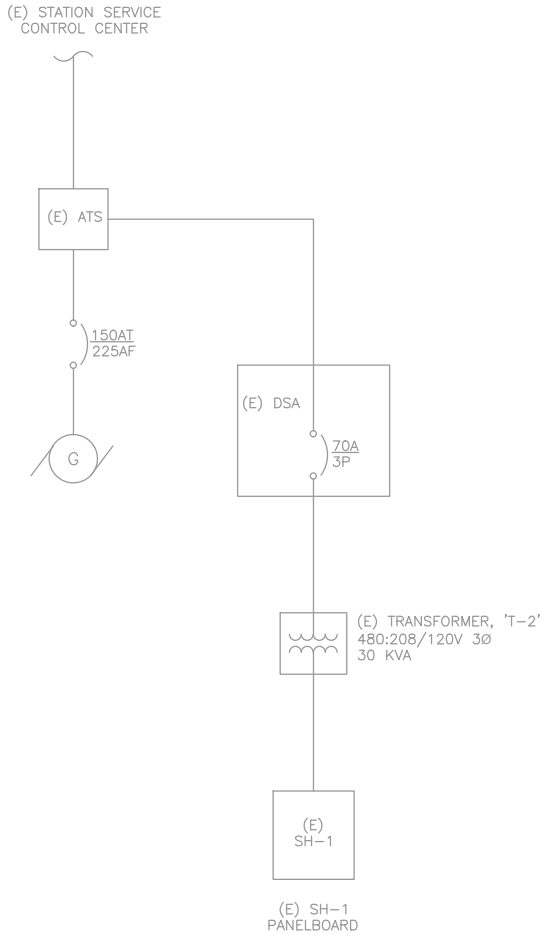
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PROJECT NAME AND SHEET DESCRIPTION:
PACHECO PUMPING PLANT
PRIORITY 1 FIRE PROTECTION
IMPROVEMENTS
FIRE ALARM BLOCK DIAGRAM

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES		ENGINEERING CERTIFICATION	SANTA CLARA VALLEY WATER DISTRICT	PROJECT NAME AND SHEET DESCRIPTION:	SCALE AS SHOWN	PROJECT NUMBER 91214010
					 Kennedy Jenks 303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107	DATE FEB 2020 DESIGN SLS DRAWN MJS CHECKED KCA	 2/14/2020 ENGINEER _____ DATE _____ PROJECT ENGINEER ACCEPTED BY DISTRICT _____ DATE _____	 PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS FIRE ALARM BLOCK DIAGRAM	VERIFY SCALES  BAR IS ONLY A GUIDE TO ORIGINAL DRAWING IF THIS SCALE DOES NOT MATCH THE ORIGINAL SCALES ACCORDINGLY	SHEET CODE: E-02 Page 49 of 484 OF 14

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FILENAME: \\KJC\KJC-Root\KJ-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\E-03.dwg
DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXXX



PARTIAL SINGLE LINE DIAGRAM

PANELBOARD (E) SH-1							FED FROM: (E) DSA								
208	/120 VOLTS, THREE PHASE, 4 WIRE				BUS:		125	AIC: 10KA		MAIN: 125A/3P			MOUNTING: SURFACE		
CKT. NO.	DESCRIPTION	CONNECTED KVA			TRIP AMPS/ POLES	CKT. NO.	DESCRIPTION	CONNECTED KVA			TRIP AMPS/ POLES				
		A	B	C				A	B	C					
1	ASD-1 HEATER	1.25			15/1	2	PCP-1 HEATER				15/1				
3	ASD-2 HEATER		1.25		15/1	4	PCP-2 HEATER		0.40		15/1				
5	ASD-3 HEATER			1.25	15/1	6	PCP-3 HEATER			0.40	15/1				
7	ASD-4 HEATER	1.25			15/1	8	PCP-4 HEATER	0.40			15/1				
9	ASD-5 HEATER		1.25		15/1	10	PCP-5 HEATER		0.40		15/1				
11	ASD-6 HEATER			1.25	15/1	12	PCP-6 HEATER			0.40	15/1				
13	ASD-7 HEATER	1.25			15/1	14	PCP-7 HEATER	0.40			15/1				
15	ASD-8 HEATER		1.25		15/1	16	PCP-8 HEATER		0.40		15/1				
17	ASD-9 HEATER			1.25	15/1	18	PCP-9 HEATER			0.40	15/1				
19	ASD-10 HEATER	1.25			15/1	20	PCP-10 HEATER	0.40			15/1				
21	ASD-11 HEATER		1.25		15/1	22	PCP-11 HEATER		0.40		15/1				
23	ASD-12 HEATER			1.25	15/1	24	PCP-12 HEATER			0.40	15/1				
25	MCP HEATER	0.60			15/1	26	MCP HEATER	0.40			15/1				
27	SPARE				15/1	28	EXIT LIGHTS		0.20		15/1				
29	SPARE				15/1	30	SAPRE				15/1				
PHASE SUBTOTALS (KVA):		5.60	5.00	5.00				2.00	1.80	1.60					
PHASE TOTALS (KVA):								7.6	6.8	6.6					
PHASE TOTALS (AMPS):								63.3	56.6	55.0					
TOTAL (KVA):										21.0	KVA				
MAX PHASE AMPS										63.3	A				
PERCENT LOAD MAX PHASE:										50.6	%				
TOTAL (AMPERES):										58	A				

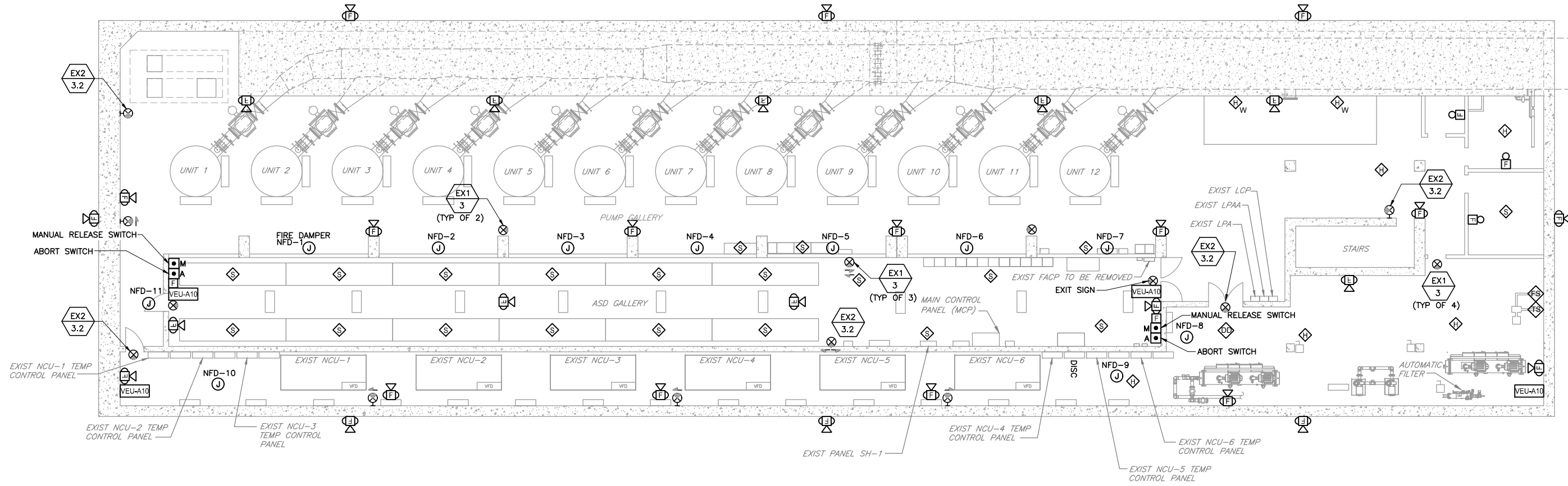
LUMINAIRE SCHEDULE					
TYPE	DESCRIPTION	LAMPS	WATTS /FIXTURE	MANUFACTURER CATALOG NUMBER	MOUNTING
EX1	LED EXIT LIGHT, SINGLE FACE, GREEN LETTERING WITH 90 MINUTE EMERGENCY NI-CAD BATTERY. PROVIDE DIRECTIONAL ARROWS AS SHOWN ON DRAWING.	LED	3	LITHONIA #ECBG LED M6 OR EQUAL	SURFACE
EX2	LED EXIT LIGHT, SINGLE FACE, GREEN LETTERING WITH TWO EMERGENCY 1W LED LIGHTS AND 90 MINUTE EMERGENCY NI-CAD BATTERY. PROVIDE DIRECTIONAL ARROWS AS SHOWN ON DRAWINGS.	LED	3.2	LITHONIA #ECG LED M6 OR EQUAL	SURFACE CEILING

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES	Kennedy Jenks 303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107	DATE FEB 2020		ENGINEERING CERTIFICATION	Valley Water	SANTA CLARA VALLEY WATER DISTRICT	PROJECT NAME AND SHEET DESCRIPTION: PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS MAIN STRUCTURE SINGLE LINE, PANELBOARD AND LTG SCHEDULE	SCALE NOT TO SCALE	PROJECT NUMBER 91214010
						DESIGN SLS				VERIFY SCALES		SHEET CODE: E-Q3	
						DRAWN JMO						Attachment 4 Page 480 of 484	
						CHECKED		2/14/2020		BAR IS ON ORIGINAL DRAWING IF THIS SHEET IS NOT SCALED ACCORDINGLY			
						KCA		ENGINEER		PROJECT ENGINEER	ACCEPTED BY DISTRICT	DATE	10 OF 14

USERNAME: Jeantl 2/14/2020 1:01 PM
FILENAME: \\KJC\KJC-Root\KJ-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\E-04.dwg
DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXX



- NOTES:**
1. FOR NEW UNDERFLOOR DETECTION DEVICES, SEE SHEET E-5.
 2. CIRCUIT EXIT FIXTURES WITH 3/4" RSC WITH #12 WIRES AND HOME RUN TO (E) PANEL SH-1. CONTRACTOR CAN ALSO HOME RUN TO (E) PANEL LPAA. UPDATE AS-BUILT DRAWINGS ACCORDINGLY. TYPICAL ALL SHEETS WITH EXIT FIXTURES.
 3. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF EXISTING PANELBOARDS.

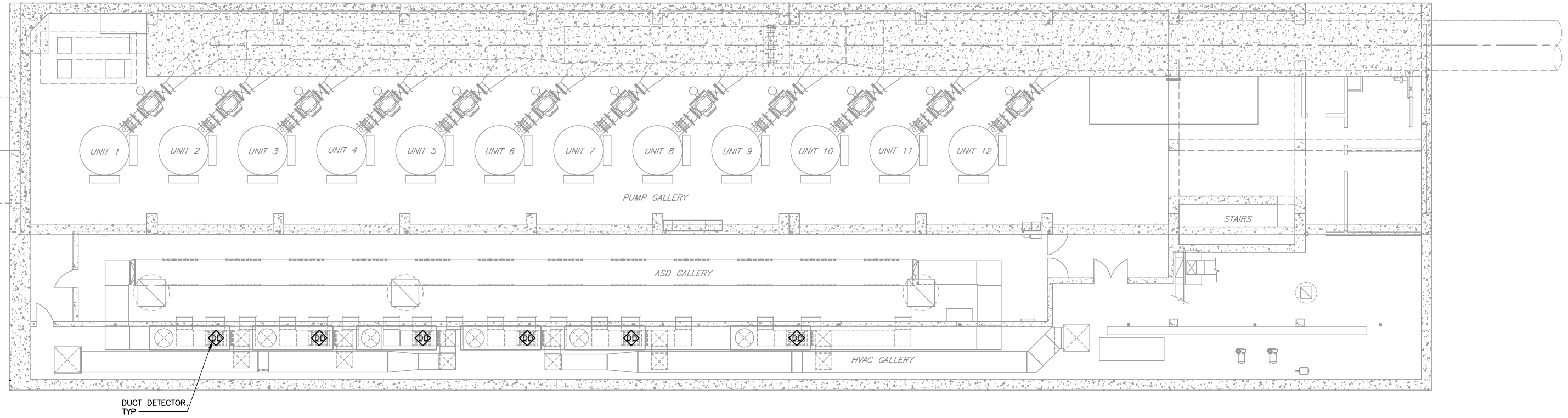


PLAN AT ELEVATION 548.50
SCALE: 1" = 10'-0"

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES	DATE	ENGINEERING CERTIFICATION	SANTA CLARA VALLEY WATER DISTRICT	PROJECT NAME AND SHEET DESCRIPTION:	SCALE	PROJECT NUMBER
					FEB 2020			PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS	AS SHOWN	91214010
					DESIGN			MAIN STRUCTURE (BASEMENT) FIRE ALARM SYSTEM AND EXIT LIGHTING	VERIFY SCALES	SHEET CODE:
					SLS				0 1" = 10'	E-04
					DRAWN				BAR IS ON ALL SHEETS	Attachment 4
					MJS				IF THIS SHEET IS NOT THE ORIGINAL DRAWING	Page 481 of 484
					CHECKED				SCALES ACCORDINGLY	11 OF 14
					KCA	ENGINEER	DATE	PROJECT ENGINEER	ACCEPTED BY DISTRICT	

USERNAME: Jeantl 2/14/2020 1:00 PM
FILENAME: \\KJC\KJC-Root\KJ-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\E-05.dwg

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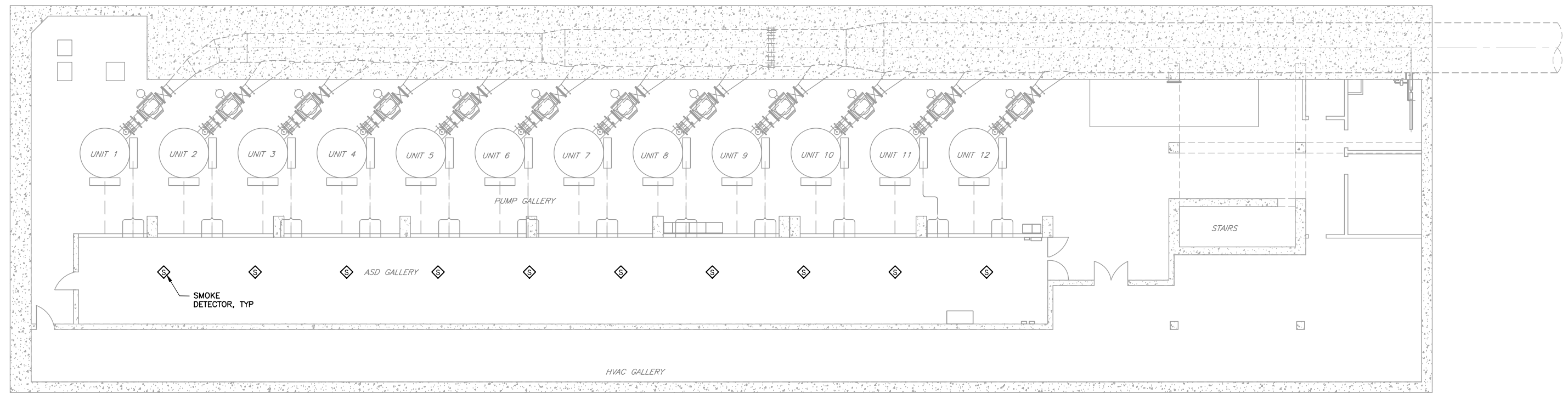


PLAN ELEVATION AT 548.50
SCALE: 1" = 10'-0"

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES			DATE	ENGINEERING CERTIFICATION	SANTA CLARA VALLEY WATER DISTRICT	PROJECT NAME AND SHEET DESCRIPTION:		SCALE	PROJECT NUMBER
					 303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107		FEB 2020			PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS MAIN STRUCTURE (BASEMENT) FIRE ALARM HVAC DUCT DETECTORS		AS SHOWN	91214010
							DESIGN					VERIFY SCALES	SHEET CODE:
							DRAWN					0 = 1"	E-05
							CHECKED					BAR IS ON ALL ORIGINAL DRAWING IF THIS SHEET ADJUST SCALES ACCORDINGLY	Page 482 of 484 12 OF 14
							KCA	ENGINEER	PROJECT ENGINEER	ACCEPTED BY DISTRICT			

USERNAME: Jeanl 2/14/2020 1:00 PM
FILENAME: \\KJC\KJC-Root\KJ-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\E-06.dwg

DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXX



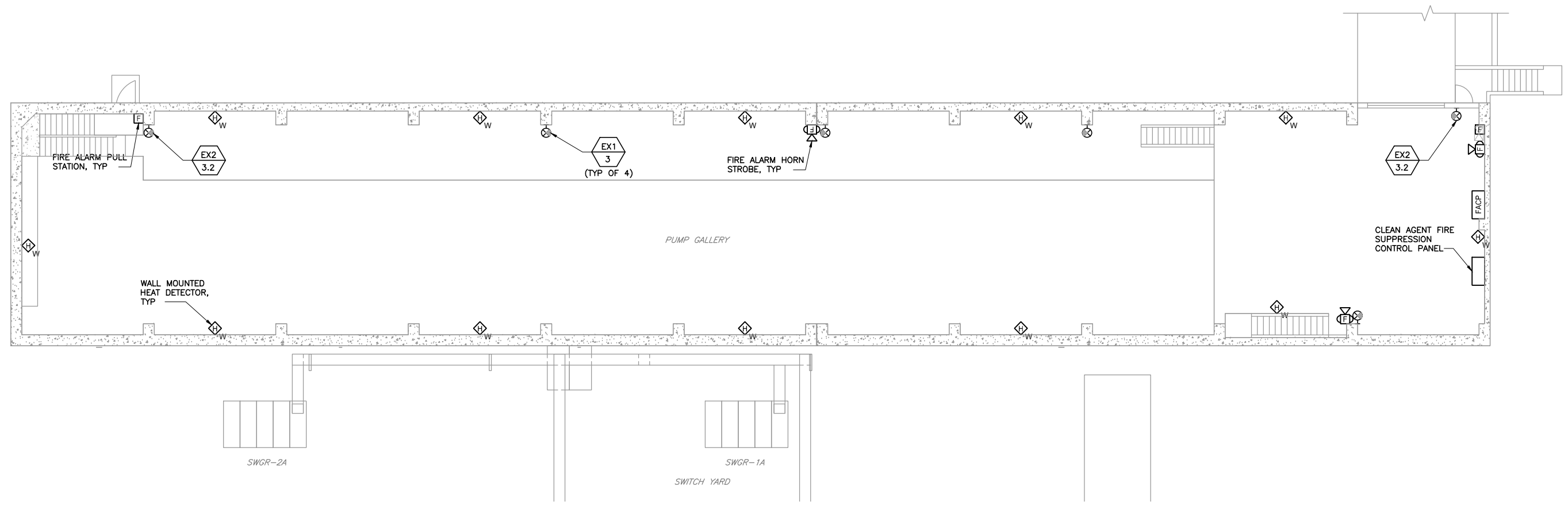
PLAN ELEVATION AT 546.50

SCALE: 1" = 10'-0"

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES			DATE	ENGINEERING CERTIFICATION	SANTA CLARA VALLEY WATER DISTRICT	PROJECT NAME AND SHEET DESCRIPTION:		SCALE	PROJECT NUMBER
					 303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107		FEB 2020			PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS MAIN STRUCTURE (CRAWL SPACE) FIRE ALARM SYSTEM		AS SHOWN	91214010
							DESIGN					VERIFY SCALES	SHEET CODE:
							DRAWN					0 1"	E-06
							CHECKED					BAR IS ON ORIGINAL DRAWING IF THIS SHEET IS ADJUSTED SCALES ACCORDINGLY	Page 483 of 484 13 OF 14
							KCA	ENGINEER	PROJECT ENGINEER	ACCEPTED BY DISTRICT	DATE		

USERNAME: Jeantl 2/14/2020 1:00 PM
FILENAME: \\KJC\KJC-Root\KJ-Cad\SanFrancisco\2017\1768020.02 - SCWD-PPP Priority 1 FireProtection\E-07.dwg

DOCUMENT NUMBER: PPP-E-XXXXXXXXXXXX



PLAN ELEVATION AT 571.83
SCALE: 1" = 10'-0"

REV	DESCRIPTION	DATE	APPR.	REFERENCE INFORMATION AND NOTES	 303 SECOND STREET, SUITE 300 SOUTH, SAN FRANCISCO, CA 94107	DATE FEB 2020	ENGINEERING CERTIFICATION 	SANTA CLARA VALLEY WATER DISTRICT 	PROJECT NAME AND SHEET DESCRIPTION: PACHECO PUMPING PLANT PRIORITY 1 FIRE PROTECTION IMPROVEMENTS MAIN STRUCTURE FIRE ALARM MEZZANINE LEVEL	SCALE AS SHOWN 0 1" BAR IS ON ORIGINAL DRAWING IF THIS SHEET IS ADJUST SCALES ACCORDINGLY	PROJECT NUMBER 91214010 SHEET CODE: E-07 Attachment 4 Page 484 of 484
						DESIGN	2/14/2020	PROJECT ENGINEER	ACCEPTED BY DISTRICT		14 OF 14
						SLS					
						DRAWN					
						MJS					
						CHECKED					
						KCA					