COUNTY OF TULARE
STATE OF CALIFORNIA

BID DOCUMENTS
AND SPECIFICATIONS
FOR CONSTRUCTION OF
WATER SYSTEM IMPROVEMENTS FOR
YETTEM & SEVILLE (PHASE 1)

VOLUME 1

FUNDED BY:
A GRANT UNDER THE STATE WATER RESOURCES CONTROL BOARD, DIVISION OF FINANCIAL ASSISTANCE THROUGH THE DRINKING WATER STATE REVOLVING FUND
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STATE OF CALIFORNIA

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APPROVED: Reed Schenke, P.E.
RMA Director, County of Tulare

DATE: 2/13/18

APPROVED: Matthew Kemp, P.E.
Project Engineer, Provost & Pritchard Consulting Group

DATE: 2/12/18
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# Table of Contents

## Volume 1

### Division 00 - Bidding and Contract Documents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 00 05</td>
<td>Table of Contents</td>
<td>4</td>
</tr>
<tr>
<td>00 00 20</td>
<td>Advertisement for Bids</td>
<td>4</td>
</tr>
<tr>
<td>00 01 00</td>
<td>Instruction to Bidders</td>
<td>6</td>
</tr>
<tr>
<td>00 03 10</td>
<td>Bid Form</td>
<td>54</td>
</tr>
<tr>
<td>00 03 15</td>
<td>Subcontractor List Form</td>
<td>6</td>
</tr>
<tr>
<td>00 03 16</td>
<td>Non-Collusion Declaration and Certification of Exclusion of Builder's Risk Insurance Cost</td>
<td>4</td>
</tr>
<tr>
<td>00 05 01</td>
<td>Bid Bond</td>
<td>2</td>
</tr>
<tr>
<td>00 05 02</td>
<td>Performance Bond</td>
<td>4</td>
</tr>
<tr>
<td>00 05 03</td>
<td>Statutory Payment Bond</td>
<td>4</td>
</tr>
<tr>
<td>00 05 04</td>
<td>Worker’s Compensation Insurance Certificate</td>
<td>2</td>
</tr>
<tr>
<td>00 05 06</td>
<td>Agreement</td>
<td>8</td>
</tr>
<tr>
<td>00 05 07</td>
<td>State Wage Determination</td>
<td>2</td>
</tr>
<tr>
<td>00 05 08</td>
<td>Payroll Submittal Information</td>
<td>2</td>
</tr>
<tr>
<td>00 05 09</td>
<td>Conditional/Unconditional Release Forms</td>
<td>8</td>
</tr>
<tr>
<td>00 07 00</td>
<td>General Conditions</td>
<td>82</td>
</tr>
<tr>
<td>00 31 46</td>
<td>Permits</td>
<td>4</td>
</tr>
</tbody>
</table>

### Division 01 - General Requirements

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 00 05</td>
<td>Specifications</td>
<td>4</td>
</tr>
<tr>
<td>01 11 00</td>
<td>Description of Work and Schedule Constraints</td>
<td>6</td>
</tr>
<tr>
<td>01 11 05</td>
<td>Engineer’s Status During Construction</td>
<td>4</td>
</tr>
<tr>
<td>01 11 10</td>
<td>Coordination of Work</td>
<td>2</td>
</tr>
<tr>
<td>01 20 00</td>
<td>Measurement and Payment</td>
<td>4</td>
</tr>
<tr>
<td>01 31 19</td>
<td>Project Meetings</td>
<td>2</td>
</tr>
<tr>
<td>01 33 00</td>
<td>Submittal Procedures</td>
<td>6</td>
</tr>
<tr>
<td>01 35 00</td>
<td>Material Substitution Procedures</td>
<td>6</td>
</tr>
<tr>
<td>01 42 13</td>
<td>Definitions and Abbreviations</td>
<td>6</td>
</tr>
<tr>
<td>01 43 00</td>
<td>Quality Control and Testing</td>
<td>2</td>
</tr>
<tr>
<td>01 50 00</td>
<td>Temporary Facilities</td>
<td>2</td>
</tr>
<tr>
<td>01 51 36</td>
<td>Watering</td>
<td>2</td>
</tr>
<tr>
<td>01 57 19</td>
<td>Environmental Mitigation Measures</td>
<td>4</td>
</tr>
<tr>
<td>01 57 23</td>
<td>Storm Water Pollution Prevention Plan</td>
<td>10</td>
</tr>
<tr>
<td>01 57 27</td>
<td>Dust Control</td>
<td>4</td>
</tr>
<tr>
<td>01 57 50</td>
<td>Construction Stakes, Lines, and Grades</td>
<td>2</td>
</tr>
<tr>
<td>01 77 00</td>
<td>Contract Closeout</td>
<td>4</td>
</tr>
</tbody>
</table>

### Division 02 - Existing Conditions

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 01 20</td>
<td>Protecting Existing Underground Utilities</td>
<td>2</td>
</tr>
<tr>
<td>02 41 00</td>
<td>Demolition</td>
<td>6</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

## DIVISION 03 – CONCRETE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 15 00</td>
<td>CONCRETE ACCESSORIES</td>
<td>8</td>
</tr>
<tr>
<td>03 15 20</td>
<td>ANCHOR BOLTS &amp; POST-INSTALLED ANCHORS</td>
<td>4</td>
</tr>
<tr>
<td>03 30 00</td>
<td>CAST-IN-PLACE CONCRETE (SITE WORK)</td>
<td>14</td>
</tr>
<tr>
<td>03 60 00</td>
<td>GROUT</td>
<td>4</td>
</tr>
</tbody>
</table>

## DIVISION 05 - METALS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 05 20</td>
<td>BOLTS, WASHER, ANCHORS AND EYEBOLTS</td>
<td>4</td>
</tr>
<tr>
<td>05 12 00</td>
<td>STRUCTURAL STEEL AND MISCELLANEOUS METALS</td>
<td>6</td>
</tr>
<tr>
<td>05 50 00</td>
<td>FABRICATED METAL</td>
<td>6</td>
</tr>
<tr>
<td>05 52 00</td>
<td>HAND RAILING AND LADDERS</td>
<td>6</td>
</tr>
</tbody>
</table>

## DIVISION 09 - FINISHES

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 90 00</td>
<td>PAINTING AND COATING</td>
<td>14</td>
</tr>
</tbody>
</table>

## DIVISION 26 - ELECTRICAL

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 05 00</td>
<td>BASIC ELECTRICAL MATERIALS AND METHODS</td>
<td>9</td>
</tr>
<tr>
<td>26 05 19</td>
<td>CONDUCTORS AND CABLES</td>
<td>8</td>
</tr>
<tr>
<td>26 05 26</td>
<td>GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS</td>
<td>5</td>
</tr>
<tr>
<td>26 05 33</td>
<td>RACeways AND BOXES</td>
<td>12</td>
</tr>
<tr>
<td>26 05 53</td>
<td>ELECTRICAL IDENTIFICATION</td>
<td>8</td>
</tr>
<tr>
<td>26 05 73</td>
<td>ELECTRICAL SYSTEM STUDIES</td>
<td>10</td>
</tr>
<tr>
<td>26 18 11</td>
<td>OVERCURRENT PROTECTION DEVICES</td>
<td>7</td>
</tr>
<tr>
<td>26 22 00</td>
<td>LOW VOLTAGE TRANSFORMER – DRY TYPE (600VAC AND LESS)</td>
<td>5</td>
</tr>
<tr>
<td>26 24 13</td>
<td>SWITCHBOARDS</td>
<td>6</td>
</tr>
<tr>
<td>26 24 16</td>
<td>PANELBOARDS</td>
<td>4</td>
</tr>
<tr>
<td>26 27 26</td>
<td>WIRING DEVICES</td>
<td>4</td>
</tr>
<tr>
<td>26 28 16</td>
<td>SAFETY SWITCHES AND INDIVIDUAL MOUNTED CIRCUIT BREAKERS</td>
<td>4</td>
</tr>
<tr>
<td>26 29 33</td>
<td>SOLID STATE REDUCED VOLTAGE CONTROLLER</td>
<td>8</td>
</tr>
<tr>
<td>26 32 13</td>
<td>ENGINE GENERATOR</td>
<td>8</td>
</tr>
<tr>
<td>26 36 00</td>
<td>AUTOMATIC TRANSFER &amp; BYPASS-ISOLATION SWITCH</td>
<td>9</td>
</tr>
<tr>
<td>26 50 00</td>
<td>LIGHTING</td>
<td>4</td>
</tr>
</tbody>
</table>

## VOLUME 2

### DIVISION 31 – EARTHWORK

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 11 00</td>
<td>CLEARING AND GRUBBING</td>
<td>2</td>
</tr>
<tr>
<td>31 23 00</td>
<td>EARTHWORK</td>
<td>8</td>
</tr>
<tr>
<td>31 23 16</td>
<td>TRENCHING BACKFILLING AND COMPACTING</td>
<td>10</td>
</tr>
<tr>
<td>31 23 21</td>
<td>DEWATERING</td>
<td>2</td>
</tr>
<tr>
<td>31 37 16</td>
<td>RIPRAPH</td>
<td>2</td>
</tr>
</tbody>
</table>

### DIVISION 32 - EXTERIOR IMPROVEMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 11 23</td>
<td>AGGREGATE BASE</td>
<td>6</td>
</tr>
<tr>
<td>32 12 13</td>
<td>BITUMINOUS PRIME AND TACK COAT</td>
<td>4</td>
</tr>
</tbody>
</table>
32 12 16  ASPHALT AND CONCRETE PAVING  6
32 12 36  SEAL COAT  4
32 31 00  FENCING  2

DIVISION 33 - UTILITIES
33 01 00  PIPE AND FITTINGS  18
33 05 24  STEEL PIPE CASING  2
33 05 26  UTILITY LINE MARKING  2
33 13 00  DISINFECTION OF WATER DISTRIBUTION SYSTEM  4
33 16 14  BOLTED STEEL TANKS  8

DIVISION 40 - PROCESS INTEGRATION
40 05 20  VALVES  28
40 05 60  AIR-RELEASE AND VACUUM-RELIEF VALVES  9
40 05 70  GLOBE CONTROL VALVES  10
40 07 75  PIPING AND EQUIPMENT IDENTIFICATION  4
40 20 10  PIPE SUPPORTS  6
40 20 90  PVC AND CPVC PROCESS AND CHEMICAL PIPING  4
40 50 00  INSTRUMENTATION AND CONTROLS - GENERAL PROVISIONS  23
40 50 01  I&C - TESTING  9
40 51 20  PLC HARDWARE AND SOFTWARE  22
40 51 50  CONTROL PANELS AND PANEL MOUNTED EQUIPMENT  16
40 51 70  SCADA RADIO COMMUNICATION EQUIPMENT  5
40 91 25  MAGNETIC FLOWMETERS  4
40 91 30  PROCESS PRESSURE AND LEVEL INSTRUMENTS  6
40 96 31  SCADA CONTROL LOOP DESCRIPTION  4

DIVISION 43 - PROCESS GAS AND LIQUID HANDLING, PURIFICATION AND STORAGE
43 21 15  HORIZONTAL END SUCTION CENTRIFUGAL PUMPS  10
43 21 16  HORIZONTAL SPLIT-CASE CENTRIFUGAL PUMPS  10
43 42 85  HYDRO PNEUMATIC TANK SYSTEM  4

DIVISION 46 - WATER AND WASTEWATER EQUIPMENT
46 33 44  CHEMICAL FEED PUMPS AND APPURTENANCES  4

APPENDIX
1. SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT - APPLICATION
2. WATER SERVICE LIST
3. METER DATA
4. REQUEST FOR CONSTRUCTION STAKING
5. GEOTECHNICAL REPORT

TABLE OF CONTENTS 000005 - 3
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End of Section
NOTICE IS HEREBY GIVEN that individually sealed bids for the Water System Improvements for Yettem and Seville (Phase 1) will be accepted by the Clerk of the Board of Supervisors, County of Tulare, Administration Building, 2800 W. Burrel Avenue, Visalia, California until 4:00 p.m. on Thursday, March 22, 2018.

Project Description: The work to be done consists, in general, of installing new water mains, valves, fire hydrants, blow-offs, services, meters, and all necessary appurtenances to construct a new water distribution system in the community of Seville; constructing a 211,000-gallon water storage tank and booster pumps in Seville (if awarded as an add alternate bid item); fencing and grading the site for the water storage tank and booster pumps (if awarded as an add alternate bid item); providing a portable generator (if awarded as an add alternate bid item) and abandoning the existing Seville water distribution system. Other items or details not mentioned herein that are required by the plans, Standard Specifications or these Special Provisions shall be performed, constructed, furnished or installed. Bidders are encouraged to visit the project site. The contractor will provide a 1-year workmanship guarantee.

An optional pre-bid conference will be held at the Tulare County Resource Management Agency RMA Conference Room L, 5961 S. Mooney Blvd. Ave Visalia, CA 93277 at 10:00 a.m. on Thursday, March 1, 2018. The pre-bid conference is optional; Bidders that attend shall sign the pre-bid conference attendance roster.

Plans, specifications, and proposal forms for bidding this project can only be obtained at the Tulare County Resource Management Agency Permit Center, 5961 South Mooney Boulevard, Visalia, CA 93277; Telephone (559) 624-7000, Office Hours 9:00 AM – 4:30 PM Mon-Thurs; 9:00 AM – 11:00 AM Fri. There is a non-refundable fee of $25.00 per set for the documents. When obtaining the documents verify the name of the project as several projects could be open at the same time. An unofficial set of Plans, Specifications, and other project information is available for download at the County's website at the following address:

http://www.tularecounty.ca.gov/rma/index.cfm/public-works/public-works-projects/

Each bid shall be submitted individually on Bid Forms provided by Resource Management Agency along with accompanying documents and a Cashier's Check or Bid Bond for not less than ten percent (10%) of the total base amount of the bid, sealed in an envelope marked with the project title and the time and date of the bid opening.

The bids will be opened, examined and declared by a Deputy Clerk of the Board of Supervisors at the time and on the date above written. The bid opening will be open to the public and held in the Conference Room of the Board of Supervisors in the Tulare County Administration Building, County Civic Center, 2800 W. Burrel Avenue, Visalia, California. The results of the Bidding shall be reported to the Board of Supervisors at their next regular meeting thereafter.

The contract will be awarded to the lowest responsible bidder submitting a responsive bid.

TIME OF COMPLETION: The Project is to be completed within 190 calendar days from the date to be established in the “NOTICE TO PROCEED” if the Base Bid or the Base Bid and Add Alternate No. 1
are awarded. The Project is to be completed within 250 calendar days from the date to be established in the "NOTICE TO PROCEED" if the Base Bid and Add Alternate No. 2 or 3 are awarded.

The Agreement includes provisions for Liquidated Damages if the Project is not timely completed.

The successful Bidder shall possess a Class “A” California Contractor's License at the time the bid is submitted.

The successful Bidder shall furnish the bonds, insurance policies and certificates, specified in the Instructions to Bidders and General Conditions.

The successful Bidder will be entitled to establish an Escrow in lieu of withheld payments pursuant to California Public Contract Code Section 22300, and the General Conditions.

Any Contractor to whom a contract is awarded and any subcontractor under him shall pay all workers employed on the work not less than the prevailing wage rates determined by the Director of the Department of Industrial Relations ("DIR") and shall comply with all laws and regulations relating to the employment of apprentices. Said wage rates pursuant to Section 1773.2 of the Labor Code are on file with the Clerk of the Board of Supervisors, Administration Building, 2800 W. Burrel Avenue, Visalia, California and will be made available to any interested person on request.

All contractors and subcontractors performing public works, before bidding or accepting any public works contract, must register and meet requirements using the DIR's online application at: https://efiling.dir.ca.gov/PWCR/ActionServlet?action=displayPWCRegistrationForm

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

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

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

Contractor shall comply with Title VI of the Civil Rights Act of 1964, and in accordance with said Act, no person on the grounds of race, color, sex or national origin, shall be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any service or activity in connection with the project.

Contractor shall comply with Title VII of the Civil Rights Act of 1964, which prohibits discrimination against any employee or applicant for employment because of race, color, religion, sex or national origin.

After the time set for opening of bids, no bid may be withdrawn for a period of one hundred and twenty (120) days.

The Board of Supervisors reserves the right to deem the bid non-responsive for any information crossed out from the bid packet including information completed by the manufacturer.

The Board of Supervisors reserves the right to reject any or all bids, and/or waive any informality in any bid, and/or determine in its discretion the responsibility of any bidder.

The Board of Supervisors further reserves all rights to use County Forces, or to negotiate contracts, or both, to the extent authorized by the Public Contract Code.
Date: February 16, 2018

By Order of the Board of
Supervisors of the County of
Tulare, State of California

Michael C. Spata
County Administrative Officer/Clerk
Board of Supervisors
County of Tulare

By Original Signature
CAO
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SECTION 000100 - INSTRUCTIONS TO BIDDERS

To be considered, Bids must comply with these Instructions to Bidders.

DOCUMENTS:

Plans, specifications, and proposal forms for bidding this project can only be obtained at the Tulare County Resource Management Agency – Permit Center, 5961 South Mooney Boulevard, Visalia, CA 93277; Telephone (559) 624-7000; Office Hours 9:00 AM – 4:30 PM Mon-Thurs; 9:00 AM – 11:00 AM Fri. There is a non-refundable fee of $25.00 per set for the documents. When obtaining the documents verify the name of the project as several projects could be open at the same time. An unofficial set of Plans, Specifications, and other project information is available for download at the County’s website at the following address:

http://www.tularecounty.ca.gov/rma/index.cfm/public-works/public-works-projects/

EXAMINATION:

Before submitting a bid, bidders shall carefully examine the Plans and Specifications, and related documents, visit the site of the work and fully inform themselves as to all existing conditions and limitations, and shall include in the bid a sum to cover the cost of all items included in the work.

A non-mandatory pre-bid conference will be held at 10:00 a.m. on Thursday March 1, 2018 at the Tulare County Resource Management Agency RMA Conference Room L, 5961 S. Mooney Blvd. Ave Visalia, CA Bidders that attend the pre-bid conference will sign the pre-bid conference attendance roster.

INTERPRETATIONS, ADDENDA:

A. Should a bidder find discrepancies, inconsistencies or omissions from the Drawings, Specifications and Related Documents, or should a bidder be in doubt as to their meaning, they shall at once notify the County, in writing by email or letter as follows:

TO:
Ross Miller, Chief Engineer
RMiller@co.tulare.ca.us
Resource Management Agency
5961 S. Mooney Blvd.
Visalia, California 93277

WITH A COPY TO:
Andres Perez, Engineer II
APerez3@co.tulare.ca.us
Resource Management Agency
5961 S. Mooney Blvd.
Visalia, California 93277

All communication by email must include “YSPI” in subject line. Any such item not brought to the County’s attention by 4:30 p.m., Tuesday, March 13, 2018 shall be done in accordance with the County's interpretation for the good of the work in accordance with the intent and meaning of the Contract Documents. Neither County nor County’s Representative will be responsible for oral instructions or information. Questions received by 4:30 p.m. on Tuesday, March 13, 2018 will be addressed in the Question & Answer Document or answered by a written Addendum directed to all bidders.

B. Any Addenda issued by the County or County’s Representative during the time of bidding are to be considered in the Bid, and will become a part of the Agreement between Contractor and County. Bidders shall acknowledge receipt of all Addenda on the Bid Form in the space provided.
QUALITY ASSURANCE:
The Agency uses a Quality Assurance Program (QAP) to ensure a material is produced to comply with the Contract. You may examine the records and reports of tests the Agency performs if they are available at the job site. Schedule work to allow time for QAP.

SUBSTITUTION OF MATERIALS:

Materials, other than those specified, must be approved by Addenda issued by the County or County’s Representative prior to bid opening, otherwise if the bidder submits non-approved materials with the bid, the bidder assumes the risk the bid may be nonresponsive because the County may not approve the desired substitution. See Article 15.1 of GENERAL CONDITIONS and Section 013500 MATERIAL SUBSTITUTION PROCEDURES for detailed requirements regarding post-Bid substitution requests.

BIDS:

A. Bids must be made on the "Bid Form" included in these Specifications, or a copy thereof, all blank spaces filled, the signature shall be in longhand, and the completed form shall be without alterations or erasures. All amounts must be in words as well as in figures. Any discrepancy between the words and figures shall be resolved using the amount stated in words. The "Bid Form" must be filled out in ink or be typewritten. Where the bidder is a corporation, the "Bid Form" must be signed using the name of the corporation followed by the name of state of incorporation and the signatures of an officer authorized to bind the corporation to a Contract. A bid, which is incomplete, incorrect or non-conforming, may be disregarded, in the sole discretion of the Board of Supervisors.

B. Bids shall be addressed and delivered to:

Clerk of the Board of Supervisors
County of Tulare
Administration Building
2800 W. Burrel Avenue
Visalia, CA 93291

C. Each bid shall be delivered in separate opaque sealed envelope bearing on the outside, the name of the bidder, the bidder’s address, the name of the Project, and the scheduled date and time for the bid opening. Bids will be accepted until the date and time stated in the Advertisement for Bid. Also, to be included in each envelope shall be:

1. A certified Bid Bond or cashier's check for 10% of the bid amount referring to the Bid Package bid upon.

2. No bid will be valid without the complete listing of subcontractors performing more than one-half (½) of one percent (1%) of total contract with the signature of the contractor submitting the bid in the space indicated.

3. A completed, Non-Collusion Declaration referring to the Bid Package bid upon.
4. County reserves the right to deem the bid non-responsive for any information crossed out from the bid packet including information completed by the manufacturer.

D. All bids shall remain firm for a period of one hundred twenty (120) calendar days after the date of bid opening.

E. Bids may not be modified after the designated time for bid opening. Upon presentation of satisfactory identification, bidders may withdraw and resubmit bids at any time prior to bid opening. No bid may be withdrawn until 90 days after the bid opening.

F. The responsibility of bidders and of their proposed Subcontractors will be considered in making the award.

G. County will determine, at its own discretion, whether a bidder is responsible.

H. A bid will be awarded to the lowest bidder. The lowest bid shall be the lowest total of the bid price on the base contract and those additive or deductive items that when taken in order from a specifically identified list of those items in the solicitation, and added to or subtracted from, the base contract, are less than, or equal to, a funding amount publicly disclosed before the first bid is opened.

I. County reserves the sole discretion to reject any or all bids or to waive informalities and irregularities in the Bid Form or the Bid process.

J. Bids expressing exceptions or qualifications on Technical Specifications may be disregarded in the sole discretion of the Board of Supervisors.

K. In accordance with the General Conditions, include in the Bid all costs for full performance of the work.

L. The following failures are not waiveable and will cause a bid to be considered nonresponsive:
   - Failure to sign the bid
   - Failure to furnish the required bid bond on the County-provided form or a cashier's check in an amount equal to 10% of the bidder's base bid
   - Failure to include a total amount of the bid
   - Failure to submit a completed addenda certification statement
   - Failure to be named on the official County planholders list

M. The decision of the County regarding the amount of a bid, or existence or treatment of a discrepancy in a bid will be final.

BID PROTESTS:

Any bid protest must be in writing and filed with the County's Assistant Director of Public Works at the Resource Management Agency, 5961 S. Mooney Blvd., Visalia, CA 93277 before 5:00 p.m. no later than five working days following bid opening (the "Bid Protest Deadline") and must comply with the following requirements:

BID
A. General. Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors and material suppliers are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. For purposes of this Bid Protest Procedure, a “working day” means a day that County is open for normal business, and excludes weekends and holidays observed by County.

B. Protest Contents. The bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the person representing the protesting bidder if different from the protesting bidder.

C. Copy to Protested Bidder. A copy of the protest and all supporting documents must be concurrently transmitted by fax or by email, by or before the Bid Protest Deadline, to the protested bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

D. Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by County before 5:00 p.m., within two working days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the “Response Deadline”). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested bidder if different from the protested bidder.

E. Copy to Protesting Bidder. A copy of the response and all supporting documents must be concurrently transmitted by fax or by email, by or before the Bid Protest Deadline, to the protesting bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

F. Exclusive Remedy. The procedure and time limits set forth in this section are mandatory and are the bidder’s sole and exclusive remedy in the event of bid protest. A bidder’s failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

G. Right to Award. The County Board of Supervisors reserves the right to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a notice to proceed with the Work notwithstanding any pending or continuing challenge to its determination.

**BID SECURITY:**

Each bidder shall submit, with their bid, a cashier’s check upon a solvent bank or a Bid Bond in an amount equal to 10% of the Base Bid made payable to County. This bid security shall be given as a guarantee that the bidder will enter into the Agreement if awarded to him and will produce the required bonds, certificates and insurance coverage, and **shall be retained as liquidated damages if he refuses to enter into said Agreement** upon request to do so by County. Bid security will be returned to all unsuccessful bidders, and to each successful bidder upon the County’s receipt of a satisfactory Performance Bond, Payment Bond, Policy of Insurance, Worker’s Compensation Insurance Certificate, executed Agreement and any other document.
required by the Contract Documents prior to the execution of the Agreement by the County. Bid Bonds shall be executed on the form included in these specifications or a facsimile thereof.

**NON-COLLUSION DECLARATION:**

Each bidder shall submit to County, with their bid, a Non-Collusion Declaration covering the bidder and all sub-contractors. The Non-Collusion Declaration shall be executed on the form included in these Specifications or a facsimile thereof.

**FORM OF AGREEMENT:**

The form of Agreement, which the successful bidder, as Contractor, will be required to execute in six (6) original counterparts is the Agreement between County and Contractor shown in these Specifications.

**PERFORMANCE BOND AND PAYMENT BOND:**

The successful bidder shall file, with County, a Performance Bond and a Payment Bond. The Payment and Performance Bonds required by these specifications will neither be accepted nor approved by the County unless the bonds are underwritten by a California admitted surety, and the requirements of California Code of Civil Procedure Section 995.630 are met. Bonds shall be executed in three (3) original counterparts on the forms included in these Specifications or facsimile thereof.

**CONTRACTOR’S LICENSE:**

At the time the bid is submitted, the bidder shall possess a valid and current Contractor's License, classification "A" issued by the State of California in order to perform the work described in the Contract Documents. Required licensing shall be maintained until the completion of the project.

**CONTRACTOR’S INSURANCE:**

Coverage: Contractor shall maintain, for the duration of the work and warranty period required under the Agreement, all Insurance in the minimum amounts required by the “GENERAL CONDITIONS.”

Prior to approval of the AGREEMENT BETWEEN COUNTY AND CONTRACTOR by COUNTY, CONTRACTOR must file with the Clerk of the Board of Supervisors evidence of insurance as set forth in 11.1 of the Special Conditions which outlines the minimum scope, specifications, and limits of insurance required under this Agreement. Additional insured endorsements required as outlined below cannot be used to reduce limits available to COUNTY as an additional insured from CONTRACTOR’S full policy limits. Insurance policies cannot be used to limit liability or to limit the indemnification provisions and requirements of this Agreement or act in any way to reduce the policy coverage and limits available from the insurer(s). If CONTRACTOR fails to maintain or renew coverage, or to provide evidence of renewal, then COUNTY may consider that failure a material breach of this Agreement. COUNTY may also withhold any payment otherwise due to CONTRACTOR for failure to provide evidence of renewal until CONTRACTOR provides such evidence.
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END OF SECTION 000100
SECTION 000310 - BID FORM

County: Board of Supervisors
County of Tulare
Administration Building
2800 W. Burrel Avenue
Visalia, CA 93291

County’s Representative: Ross Miller, P.E., Chief Engineer
County of Tulare
5961 S. Mooney Blvd.
Visalia, Ca. 93277
559-624-7070 – Phone

Consultant: Matthew Kemp, P.E.
Provost and Pritchard Consulting, Inc.
286 W. Cromwell Ave
Fresno, CA 93711
559-449-2700 – Phone

Bid For: Tulare County – Water System Improvements for Yettem & Seville (Phase 1)

1. We, the undersigned, having familiarized ourselves with the local conditions, the Advertisement for Bids, Instructions to Bidders, General Conditions, Bid Form, Supplement to Bid Form, Agreement between County and Contractor, the Drawings and Specifications and Addenda issued by the County or County’s Representative, do hereby propose to furnish all labor, materials, necessary tools, expendables, equipment, utility and transportation services necessary to complete the Work required for the above Bid Package in strict accordance with the contract documents, including all Addenda.

2. Undersigned declares that the cost of a Performance Bond in the full amount of the Agreement, and a Labor and Material Payment Bond of 100% of the amount of the Agreement is included in this bid.

3. Undersigned agrees to enter into and execute an Agreement, if awarded on the basis of this Bid, and to furnish Bonds and Insurance in accordance with Contract Documents within seven calendar (7) days after date of Award.

4. Liquidated Damages for Failure to Enter into the Agreement

Enclosed herewith is Cashiers Check or Bid Bond, made payable to the County, which is not less than 10% of the total base amount of the Bid. Should Contractor's bid be accepted and Contractor thereafter fail to enter into the Agreement on the basis of this bid, IT IS HEREBY UNDERSTOOD AND AGREED that it is, and will be, difficult or impossible to determine the actual damage which County will sustain in the event of, and by reason of, such failure to enter into the Agreement. Undersigned further agrees that said check or Bid Bond shall be forfeited as liquidated damages (not as a penalty), if undersigned fails to enter into an Agreement on the basis of this bid.
5. Undersigned acknowledges receipt of the following Addenda:

Addendum No.____ Dated__________ Addendum No.____ Dated__________
Addendum No.____ Dated__________ Addendum No.____ Dated__________

6. This Bid is valid for one hundred twenty (120) calendar days following the date for receiving Bids.

7. Undersigned proposes to enter into a contract for the following amounts:

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<th>ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS</th>
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**TOTAL AMOUNT OF BASE BID**

$_________________________________________________

**ADD ALTERNATE NO. 1 BID:**

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**Base Bid Total** for work included in this Contract necessary to complete the Tulare County – Water System Improvements for Yettem & Seville (Phase 1) as shown in the drawings and specifications. The Project shall be completed within 190 calendar days from the date to be established in the Notice to Proceed. The Agreement includes provisions for Liquidated Damages if the Project is not completed within the specified time of completion.

Total Base Bid Amount (In words) ____________________________________________________________________________

__________________________________________________________________________________

Total Base Bid Amount (In Numbers) ____________________________________________________________________________

In the event of discrepancy between the words and numbers of the Lump Sum Bid the words shall prevail.

In case of a discrepancy between words and figures, the words shall prevail. In case of a discrepancy between unit prices and total set forth for a unit basis item, the unit price shall prevail, except as provided in (a) or (b), as follows:

a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then
the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;

b) (Decimal Errors) If the product of the entered unit and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentagewise the unit price or item total in the County's estimate of cost.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise, if the item total for a lump sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or lump sums. Written unit prices, item totals, and lump sums will be interpreted according to the number of digits and, if applicable, decimal placements. Cents symbols also have no significance in establishing any unit price or item total since all such figures are assumed to be expressed in dollars and/or decimal fractions of a dollar. Bids on lump sum items shall be item totals only; if any unit price for a lump sum item is included in a bid and it differs from the item total, the item total shall prevail.

The foregoing provisions for the resolution of specific discrepancies cannot be so comprehensive as to cover every omission, inconsistency, error or other irregularity which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the Board of Supervisors, and such discretion will be exercised in the manner deemed by the Board of Supervisors to best carry out its duty to award only to the lowest responsive, responsible bidder. The decision of the Board of Supervisors respecting the amount of a bid, or the existence or treatment of a discrepancy in a bid shall be final.

If this proposal is accepted and the undersigned is awarded the Contract, given notice of the award and presented with the Contract for signature as provided in the Special Provisions, and shall fail, within the time and manner required under the Special Provisions, to sign and deliver the Agreement to the Clerk of the Board of Supervisors, together with all required insurance certificates, bonds, powers of attorney, certificate of authority, insurance rating, financial statements, proofs of licensing, and any other documents required by the Special Provisions to be filed with the signed Agreement, then the Board of Supervisors may, in its sole discretion, determine that the bidder has abandon his bid, whereupon the Board's acceptance of this proposal shall be deemed frustrated, and such bid security as may accompany this proposal shall become due and owing to the County of Tulare as liquidated damages.

CONTINUE TO NEXT PAGE
Bid Item Descriptions

The descriptions below are general descriptions and do not include estimated quantities. See drawings and bid summary for estimated quantities. Estimated quantities are provided as a courtesy only, contractor needs to verify quantities. Actual numbers and quantities of symbols on drawings prevail.

Base Bid Items

Bid Item No. 1 - Mobilization, Bonds, and Insurance

This item shall be bid a lump sum for Mobilization and Demobilization for all work associated with the Base Bid and shall conform to the provisions of Section 11 of the Caltrans Standard Specifications and these Specifications.

This item shall consist of covering the Contractor's cost for Contract Documents and for the moving of personnel, equipment, supplies and incidentals to the project site. This item shall include obtaining all permits required for the project, excluding any permits already obtained by the County of Tulare. Permit fees and all other permit preparation costs shall be included in this bid item. This item also includes demobilization, including removal of all equipment supplies, personnel, and incidentals from the project site at the end of construction.

The lump sum payment shall include the cost of mobilization, all necessary bonds, insurance, permits, licenses, fees required during the performance of the work, and demobilization. All costs associated with this item shall be included in the lump sum price and no additional payment will be made. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of contract work completed.

Bid Item No. 2 - Prepare and Implement SWPPP

This bid item is a lump sum bid for all materials, labor and appurtenances required to prepare and implement a Storm Water Pollution Prevention Plan (“SWPPP”), including preparing the SWPPP, uploading required documents on the SMARTS website, testing, monitoring and all other work associated with implementing the SWPPP and complying with State and Federal permit requirements.

The Contractor shall note that the use of biodegradable straw waddles are required.

This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.

Bid Item No. 3 - Prepare & Implement Dust Control Plan

This bid item is a lump sum bid for all materials, labor and appurtenances required to prepare and implement a Dust Control Plan (DCP), including preparing the DCP, obtaining approval from the San Joaquin Air Pollution Control District, testing, monitoring and all other work associated with implementing the DCP and complying with State and Federal permit requirements.
This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.

**Bid Item No. 4 - Worker Protection**

This bid item is a lump sum bid for providing worker protection from trench failures and other hazards that may occur during construction. The Contractor shall comply with the provisions of the Construction Safety Orders, Tunnel Safety Orders, and General Safety Orders issued by the State of California of Industrial Safety, as well as all other applicable laws, ordinances and regulations, as they pertain to the protection of workers from the hazard of caving ground. The Contractor shall obtain a permit from the Division of Industrial Safety of the State of California prior to commencement of construction.

This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.

**Bid Item No. 5 - Traffic Control**

This bid item is a lump sum bid for Traffic Control and shall conform to the provisions of the latest edition of the California Manual on Uniform Traffic Control Devices (MUTCD), County of Tulare Encroachment Permit, the provisions specified herein, and as directed by the Engineer and County Inspectors. Traffic control provisions shall conform to the following requirements:

1. The California Manual on Uniform Traffic Control Devices (MUTCD), latest edition, is hereby referred to and incorporated herein as though set forth in full. The Contractor shall be responsible for providing all necessary traffic control facilities, 24 hours per day, 7 days per week for the entire duration of the project.

2. The Contractor shall maintain pedestrian crossings with adequate visibility for approaching traffic.

3. The Contractor shall notify County Fire and Sheriff Departments, and County Transportation Department and Traffic Division at least forty-eight (48) hours in advance of any proposed lane closure. Any lane closures must have prior approval of the County of Tulare, and have pre-notification warning signs in place seven (7) calendar days prior to said closure.

4. The Contractor shall obtain an encroachment permit and approval of a traffic control plan conforming to the requirements specified herein and the Caltrans encroachment permit requirements for any work encroaching in Caltrans right-of-way or affecting traffic flow in Caltrans right-of-way.

5. The Contractor shall submit a traffic control plan to the County of Tulare (and Caltrans if required) for review and approval. A copy of the approved traffic control plan shall be provided to the Engineer prior to the start of construction activities.

6. The Contractor shall strictly comply with, and will be solely responsible for, all required traffic control and devices as per approved plan and any revisions thereof. The Contractor shall inspect the traffic control setup at two-hour intervals, at a minimum, and correct all problems immediately.
7. The Contractor shall provide safe access for the County, County’s representatives, and Caltrans (if applicable) inspection staff.

8. Specific traffic control measures associated with the work of this Contract are as follows:
   a. Existing striping and road stencil work which conflicts with detour layout shall be removed. Conflicting signs shall be covered.
   b. Where traffic is moved out of its normal position, traffic lanes must be a minimum of twelve (12) feet wide. One (1) lane of traffic in each direction shall be maintained at all times unless approved otherwise by the County (and Caltrans).
   c. Lane closures shall be limited between the hours of 9 AM to 4 PM to minimize disruptions to commuter traffic. All lane closures must be approved by the County (and Caltrans) in advance. The road shall be returned to two-way traffic outside of the hours specified above.
   d. The Contractor may use trench plates to re-open the road to two-way traffic overnight, however, temporary trench resurfacing shall be placed after each road crossing is complete. Temporary trench resurfacing shall be maintained until permanent trench resurfacing is placed. Permanent trench resurfacing shall be scheduled and placed immediately following acceptance of water installed.
   e. Access to all local streets, businesses and residences shall be maintained at all times, except as noted below. Where the Contractor’s operations block access to driveways, the Contractor shall provide a minimum of forty-eight (48) hour written notice to the residents and minimize the duration of interruptions to driveway access.

Full compensation for furnishing all labor (including flagging), materials, tools, equipment and incidentals, and for doing all work involved for the sole convenience, direction and safety of public traffic and pedestrians shall be included in this bid item. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.

**Bid Item No. 6 - Utility Potholing and New Water Service Locating**

This bid item is a lump sum bid for utility potholing, including but not limited to, notifying existing utility companies and agencies; traffic control; pavement saw-cutting, removal and disposal; excavation; identification of the horizontal and vertical locations of existing utilities or obstructions that are in the proximity of the proposed facilities to be installed; preparation of the existing utility location documentation; backfill, compaction and pavement repair. Including all other work not indicated but necessary to conduct the Potholing Existing Utilities as indicated in the Contract Documents.

Utility potholing shall include coordinating with property owners to confirm the new front-yard water service locations. The Contractor shall schedule and conduct door-to-door survey of residents with the County’s representative. Any changes to the water service locations shown on the plans shall be documented and approved by the property owner and County’s representative.
The Contractor shall conduct utility potholing and water service door-to-door survey, as a first order of work, prior to beginning water main installation. A potholing report shall be provided to the County and County’s representative for review prior to commencement of water main installation. Any changes required to the locations of proposed improvements as a result of utility conflicts shall be approved by the Engineer prior to start of construction.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, for potholing shall be paid at the lump sum price bid. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item No. 7 - Exclusionary Fencing**

This bid item is a unit price bid, per linear foot, for furnishing and installing exclusion fencing, including but not limited to, furnishing fencing materials, installing fencing and escape ramps along the project perimeter in grassland areas as specified on the Plans, Section 01 57 19 of these Specifications and as designated by the County’s biologist; maintaining and repairing fencing damaged during the course of construction, and removing fencing after construction is complete. Including all other work not indicated but necessary for Exclusion Fencing as indicated in the Contract Documents.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, maintenance and removal of exclusion fencing, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by linear foot of exclusion fence installed.

Note that the quantity in the bid form is an estimate and to be included but may not be needed at all based on environmental factors and seasonal work.

**Bid Item No. 8 - Miscellaneous Facilities and Operations**

This bid item includes miscellaneous site work including temporary fencing and sanitary facilities, maintaining drainage, provisions for dewatering, protection and support of existing facilities, removing and replacing mailboxes, signs and other improvements disturbed by construction; general project clean up, preparing record drawings and operation and maintenance manuals for the base bid work, and all costs for miscellaneous work shown and described in the Contract Documents, not included in other bid items.

This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item No. 9 - 8” PVC, C-900, DR-18, Water Main**

This bid item includes installing 8” PVC (AWWA C-900), DR-18, Water Main to the lines and grades shown on the plans, except where specifically included in another bid item, including but not limited to, pavement removal, the removal and replacement of existing privately owned improvements, the removal and replacement (in kind) of
existing drive approaches, performing excavation, supporting existing utility poles and telephone facilities required for the installation of the new water main, placing slurry backfill, as specified on the plans stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing 8” water main and fittings, restrained joints, thrust blocks, tracer wire, caution tape, backfill and compaction, restoration of unpaved surfaces, flushing, disinfection, pressure and bacteriological testing, acquisition and disposal of water used during testing.

This bid item will include installation of 8” PVC (AWWA C-900), DR-14, Water Main at utility crossing locations without minimum clearance required for DR-18 Water Main as specified on the plans.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. Class 150 or 225 water main shall refer to DR18 C-900 water main. Utility crossings shall be installed with DR-14 C-900 water main as specified. No additional cost will be paid for DR-14 water main. This bid item will be paid for by linear foot of 8” PVC, C-900, DR-14, Water Main installed.

Bid Item No. 10 - 6” PVC, C-900, DR-18, Water Main

This bid item is a unit price bid, per linear foot, for furnishing and installing 6” PVC (AWWA C-900), DR-18, Water Main to the lines and grades shown on the plans, except where specifically included in another bid item, including but not limited to, pavement removal, the removal and replacement of existing privately owned improvements, the removal and replacement (in kind) of existing drive approaches, performing excavation, supporting existing utility poles and telephone facilities required for the installation of the new water main, placing slurry backfill, as specified on the plans stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing 6” water main and fittings, restrained joints, thrust blocks, tracer wire, caution tape, backfill and compaction, restoration of unpaved surfaces, and all other work as shown on the drawings.

Flushing, disinfection, pressure and bacteriological testing, and acquisition and disposal of water used during testing is included in a separate bid item for Water Distribution System Testing.

This bid item includes installation of 6” PVC (AWWA C-900), DR-14, Water Main at utility crossing locations without minimum clearance required for DR-18 Water Main as specified on the Plans.

This bid item includes furnishing construction equipment and implementing construction in a manner to confine construction activities to the road areas along grassland habitat as specified in Section 01 57 19 to comply with environmental protection requirements, including temporary storage of materials and spoil pile from trenching activities.

The bid item price shall include full compensation for furnishing all labor, tools,
equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. Class 150 or 225 water main shall refer to DR-18 C-900 water main. Utility crossings shall be installed with DR-14 C-900 water main as required to meet separation requirements. No additional cost will be paid for DR-14 water main. This bid item will be paid for by linear foot of 6” PVC, C-900 Water Main installed.

Bid Item No. 11 - Install 18” Casing (at Railroad Crossing)

This bid item is a unit price bid, per linear foot, for all work associated with the installation of a 18” steel casing as shown on the Drawings, including but not limited to, obtaining all permits, all work and facilities required, including pavement removal, performing open cut excavation, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing 18” casing, carrier pipe supports and casing end seals, and filling annual space between carrier pipe and casing with blown sand, trench backfill and compaction, and all other work as shown on the drawings.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, and construction of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by linear foot of Steel Casing installed.

Bid Item No. 12 - 8” Gate Valve

This bid item is a unit price bid, per each, for furnishing and installing 8” gate valves at the locations shown on the plans except where specifically included in another bid item, including but not limited to the installation of the valve, valve box, concrete collar, riser, extension rod, restrained joints, and adjusting valve boxes and covers to finished grade, and all other work as shown on the drawings.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This is a unit price bid item and will be paid per each 8” gate valve and valve box installed.

Bid Item No. 13 - 6” Gate Valve

This bid item is a unit price bid, per each, for furnishing and installing 6” gate valves at the locations shown on the plans except where specifically included in another bid item, including but not limited to the installation of the valve, valve box, concrete collar, riser, extension rod, restrained joints, and adjusting valve boxes and covers to finished grade, and all other work as shown on the drawings.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in
fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This is a unit price bid item and will be paid per each 6” gate valve and valve box installed.

**Bid Item No. 14 - 1” Water Service & Meter**

This bid item is a unit price bid, per each, for furnishing and installing 1” water services complete and in place, including, trenchless excavation, all pipe, fittings, angle meter stop; sawcutting; meter box, meter; temporary and permanent trench resurfacing and grind and overlay for open cut installations and bore pits for trenchless installations; chlorination and testing; landscape repair or replacement; and all other work as shown on the drawings.

The services shall be polyethylene tubing. The installation of the water services on the long side of the road shall be bored. The installation of the water services on the short side of the road can be open cut or bored into place. Any curb and gutter on either side of the road shall not be disturbed or open cut.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each water service shall include the cost of saw cutting and temporary and permanent trench resurfacing.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in installing the water service, meter and meter box, complete in place, shall be included in the per each bid price. The final pay quantity will be based upon the actual quantity of 1” Water Services & Meters installed, as determined by the Engineer.

**Bid Item No. 15 - 1” Water Service**

This bid item is a unit price bid, per each, for furnishing and installing 1” water services (without meters) at the locations noted on the plans, complete and in place, including, trenchless excavation, all pipe, fittings, angle meter stop; sawcutting; meter box, meter spool; temporary and permanent trench resurfacing and grind and overlay for open cut installations and bore pits for trenchless installations; chlorination and testing; landscape repair or replacement; and all other work as shown on the drawings.

Water meters for services under this bid item will be furnished and installed by others.

The services shall be polyethylene tubing. The installation of the water services on the long side of the road shall be bored. The installation of the water services on the short side of the road can be open cut or bored into place. Any curb and gutter on either side of the road shall not be disturbed or open cut.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each water service shall include the cost of saw cutting and temporary and permanent trench resurfacing.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in installing the water service and meter box, complete
in place, shall be included in the per each bid price. The final pay quantity will be based upon the actual quantity of 1” Water Services installed, as determined by the Engineer.

**Bid Item No. 16 - 2” Water Service**

This bid item is a unit price bid, per each, for furnishing and installing 2” water services (without meters) at the gas station service, complete and in place, including, trenchless excavation, all pipe, fittings, angle meter stop; sawcutting; meter box, meter spool; temporary and permanent trench resurfacing and grind and overlay for open cut installations and bore pits for trenchless installations; chlorination and testing; landscape repair or replacement; and all other work as shown on the drawings.

Water meters and reduced pressure backflow preventer at these locations will be furnished and installed by others.

The services shall be polyethylene tubing. The installation of the water services on the long side of the road shall be bored. The installation of the water services on the short side of the road can be open cut or bored into place. Any curb and gutter on either side of the road shall not be disturbed or open cut.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each water service shall include the cost of saw cutting and temporary and permanent trench resurfacing.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in installing the water service and meter box, complete in place, shall be included in the per each bid price. The final pay quantity will be based upon the actual quantity of 2” Water Services installed, as determined by the Engineer.

**Bid Item No. 17 - 2” Water Service, Meter & RPBP**

This bid item is a unit price bid, per each, for furnishing and installing 2” water services for the Stone Coral Elementary School, complete and in place, including, trenchless excavation, all pipe, fittings, angle meter stop; reduced pressure backflow preventer (RPBP); sawcutting; meter box; meter; temporary and permanent trench resurfacing and grind and overlay for open cut installations and bore pits for trenchless installations; chlorination and testing; landscape repair or replacement; and all other work as shown on the drawings.

The services shall be polyethylene tubing. The installation of the water services on the long side of the road shall be bored. The installation of the water services on the short side of the road can be open cut or bored into place. Any curb and gutter on either side of the road shall not be disturbed or open cut.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each water service shall include the cost of saw cutting and temporary and permanent trench resurfacing.
Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in installing the water service and meter box, complete in place, shall be included in the per each bid price. The final pay quantity will be based upon the actual quantity of 2” Water Services, Meter & RPBP installed, as determined by the Engineer.

**Bid Item No. 18 - Fire Hydrant Assembly**

This bid item is a unit price bid, per each, for furnishing and installing fire hydrant assembly at the locations shown on the Plans, including but not limited to excavation, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing fire hydrant assembly, lateral pipe, fittings, restrained joints, thrust block, gate valve, valve box and polyethylene encasement, backfill and compaction, installation of blue pavement marker, temporary and permanent trench resurfacing and grind and overlay, restoration of unpaved surfaces, and all other work as shown on the drawings.

Flushing, disinfection, pressure and bacteriological testing, and acquisition and disposal of water used during testing is included in a separate bid item for Water Distribution System Testing.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each fire hydrant shall include the cost of saw cutting and temporary and permanent trench resurfacing.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the Plans and Specifications, and as directed by the Engineer. This bid item shall be paid at the unit price bid per each Fire Hydrant Assembly installed.

**Bid Item No. 19 - Air Valve Assembly**

This bid item is a unit price bid, per each, for furnishing and installing 1” combination air release/vacuum breaker valve assemblies at the locations shown on the plans except where specifically included in another bid item, including but not limited to all pavement removal, excavation, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing all pipe and fittings, concrete footing, control valves, backfill and compaction, the installation of the combination air valve assembly, air valve enclosure, concrete slab, chlorination and testing, temporary and permanent trench resurfacing and grind and overlay, restoration of unpaved surfaces, and all other work as shown on the drawings.

Flushing, disinfection, pressure and bacteriological testing, and acquisition and disposal of water used during testing is included in a separate bid item for Water Distribution System Testing.
Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each air valve assembly shall include the cost of saw cutting and temporary and permanent trench resurfacing.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This is a unit price bid item and will be paid per each 1” combination air release/vacuum breaker valve assembly installed.

**Bid Item No. 20 - Permanent Blow-Off Assembly**

This bid item is a unit price bid, per each, for furnishing and installing 4” permanent blow-off assemblies at the locations shown on the plans in conformance with the detail shown on the plans, including but not limited to all pavement removal, excavation, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing all pipe and fittings, restrained joints, polyethylene encasement, valves, extension rod, valve box and riser, backfill and compaction, the installation of the blow-off assembly, traffic rated vault, adjusting the vault cover to finish grade, temporary and permanent trench resurfacing and grind and overlay, restoration of unpaved surfaces, and all other work as shown on the drawings.

Flushing, disinfection, pressure and bacteriological testing, and acquisition and disposal of water used during testing is included in a separate bid item for Water Distribution System Testing.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each permanent blow-off assembly shall include the cost of saw cutting and temporary and permanent trench resurfacing.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This is a unit price bid item and will be paid per each Permanent Blow-Off Assembly installed.

**Bid Item No. 21 - Temporary Blow-Off Assembly**

This bid item is a unit price bid, per each, for furnishing and installing temporary blow-off assemblies at the locations shown on the plans in conformance with the County Standard Detail shown on the plans, including but not limited to all pavement removal, excavation, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing all pipe and fittings, thrust blocks, valves, extension rod, valve box and riser, backfill and compaction, the installation of the temporary blow-off assembly, adjusting the valve cover to finish grade, temporary and permanent trench resurfacing and grind and overlay, restoration of unpaved surfaces, and all other work as shown on the drawings.
Flushing, disinfection, pressure and bacteriological testing, and acquisition and disposal of water used during testing is included in a separate bid item for Water Distribution System Testing.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each temporary blow-off assembly shall include the cost of saw cutting and temporary and permanent trench resurfacing.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This is a unit price bid item and will be paid per each Temporary Blow-Off Assembly installed.

**Bid Item No. 22 - Bacteriological Sampling Station**

This bid item is a unit price bid, per each, for furnishing and installing bacteriological water sampling stations at the locations shown on the plans except where specifically included in another bid item, including but not limited to all pavement removal, excavation, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing all pipe and fittings, valves, test station enclosure, concrete slab, chlorination and testing, temporary and permanent trench resurfacing and grind and overlay, restoration of unpaved surfaces, and all other work as shown on the drawings.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. The cost for each sampling station shall include the cost of saw cutting and temporary and permanent trench resurfacing.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, and replacement of any existing improvements disturbed, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This is a unit price bid item and will be paid per each Bacteriological Water Sampling Station installed.

**Bid Item No. 23 - Seville Well Site Improvements**

This is a lump sum bid for Seville Well Site Improvements to connect the existing booster pumps to the new distribution system, including but not limited to all removal of site surfacing, excavation, locating existing pipe, stockpiling and disposal of unacceptable backfill material, placing pipe bedding, furnishing and installing all pipe, fittings and valves to connect to the existing onsite piping, temporary and permanent trench resurfacing and grind and overlay, and restoration of surfaces onsite. All existing surfaces shall be restored to their original condition.
Flushing, disinfection, pressure and bacteriological testing, and acquisition and disposal of water used during testing is included in a separate bid item for Water Distribution System Testing.

Any landscape and/or landscape irrigation replacement necessary shall be included in this bid item. This bid item shall include the cost of saw cutting and temporary and permanent trench resurfacing in Road 156.

The work shall include all improvements included inside the Seville Well Site fencing and in County road right of way up to the new 8-inch water main in Road 156, including locating existing buried water pipes and confirming the point of connection with the County and the County’s operator.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item No. 24 - Water Distribution System Testing**

This is a lump sum bid item for Distribution System Testing, including but not limited to, furnishing all water for testing; temporary piping, pumps and tanks to transport and store water required to fill the new distribution system and testing; all flushing; pressure testing; chlorination; bacteriological testing; and temporary equipment to conduct all testing.

The Contractor shall hire a Certified Water Hauler to obtain and haul disinfected water that meets drinking water standards, to the project site. The Contractor is responsible for paying all costs associated with purchasing and transporting water to the project site.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the installation, construction and testing of the described improvements in fully functional order, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item No. 25 - Temporary Trench Resurfacing (Main)**

This bid item is a unit price bid, per lineal foot, for all work associated with the placement, temporary stamping, maintenance, and removal (prior to the installation of permanent trench resurfacing) of an estimated quantity of temporary trench resurfacing for water main as designated by the Engineer. All trenching in roadway must be patched each day prior to end of shift. Trench plates may be used for road crossings in lieu of temporary trench resurfacing. All temporary trench resurfacing within County of Tulare and Caltrans road right of way shall consist of 2 inches of cut-back or "cold-mix" resurfacing in conformance with the County and Caltrans Encroachment Permits. Temporary trench resurfacing shall be maintained by the Contractor during
and after normal working hours and on weekends and holidays. The Contractor shall inspect the condition of the temporary surfacing at sufficient intervals and make repairs as necessary. Temporary trench resurfacing will be paid for only once at any given location.

This bid item includes trench resurfacing for water main under bid item 9 and 10. Trench resurfacing for lateral lines for other water system appurtenances such as water services, hydrants, air valve assemblies, blow-offs and test stations are included in separate bid items for said appurtenances as specified in each bid item description.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the trench resurfacing, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the unit price bid per lineal foot for an estimated quantity of trench resurfacing.

**Bid Item No. 26 - Type “A” Permanent Trench Resurfacing (Main)**

This bid item is a unit price bid, per lineal feet, for all work associated with furnishing and installing an estimated quantity of Type “A” Permanent Trench Resurfacing and stamping for the water main. Type “A” permanent trench resurfacing shall consist of 2.5” of hot mix asphalt over 6” of aggregate base as shown in Detail 5 on Sheet CTD-01 of the Plans. All permanent trench resurfacing shall be as specified on the Plans. This bid item includes trench resurfacing for water main under bid item 9 and 10. Trench resurfacing for lateral lines for water system appurtenances such as water services, hydrants, air valve assemblies, blow-offs and test stations are included in separate bid items for said appurtenances.

Reference is made to Section 39-5.01 of the Caltrans Standard Specifications. The Contractor shall use a self-propelled paving machine in accordance with the standards stated above to resurface all areas in which pavement was removed associated with the work of this Contract for trenches greater than four (4) feet in width. The Contractor shall use a roller that has a width equal to or less than the width of the trench for all trenches greater than four (4) feet in width.

Any painted traffic stripes, stencil work or pavement markers removed due to trenching or pavement resurfacing shall be repainted or replaced in kind by the Contractor in accordance with Caltrans Standards. Reference is made to Sections 59, 84-3 and 85 of the Caltrans Standard Specifications. All paint and pavement markers shall be provided by the Contractor.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the trench resurfacing, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the unit price bid per lineal foot for an estimated quantity of Type “A” Permanent Trench Resurfacing.

**Bid Item No. 27 - Type “B” Permanent Trench Resurfacing (Main)**

This bid item is a unit price bid, per lineal feet, for all work associated with furnishing and installing an estimated quantity of Type “B” Permanent Trench Resurfacing and
stamping for the water main. Type “B” permanent trench resurfacing shall consist of 2.5” of hot mix asphalt over 6” of aggregate base as shown in Detail 5 on Sheet CTD-01 of the Plans. All permanent trench resurfacing shall be as specified on the Plans. This bid item includes trench resurfacing for water main under bid item 9 and 10. Trench resurfacing for lateral lines for water system appurtenances such as water services, hydrants, air valve assemblies, blow-offs and test stations are included in separate bid items for said appurtenances.

Reference is made to Section 39-5.01 of the Caltrans Standard Specifications. The Contractor shall use a self-propelled paving machine in accordance with the standards stated above to resurface all areas in which pavement was removed associated with the work of this Contract for trenches greater than four (4) feet in width. The Contractor shall use a roller that has a width equal to or less than the width of the trench for all trenches greater than four (4) feet in width.

Any painted traffic stripes, stencil work or pavement markers removed due to trenching or pavement resurfacing shall be repainted or replaced in kind by the Contractor in accordance with Caltrans Standards. Reference is made to Sections 59, 84-3 and 85 of the Caltrans Standard Specifications. All paint and pavement markers shall be provided by the Contractor.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the trench resurfacing, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the unit price bid per lineal foot for an estimated quantity of Type “B” Permanent Trench Resurfacing.

Bid Item No. 28 - Abandon Existing Water System

This is a lump sum bid item for furnishing all labor, equipment, tools, material and incidentals for the abandonment & removal of existing water system at the locations shown on the plans in conformance with the detail shown on the plans, including but not limited to capping pipes, removing pipes as identified on the plans, abandoning existing mainline valves and removing and disposing of fire hydrants, gate valves, and water services.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete system abandonment, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

Add Alternate No. 1 Bid Items

Bid Item No. 29 - Mobilization, Bonds, and Insurance

This item shall be bid a lump sum for Mobilization and Demobilization for all work associated with the Add Alternate No. 1 (Storage Tank Site in Seville) and shall conform to the provisions of Section 11 of the Caltrans Standard Specifications and these
Specifications.

This item shall consist of covering the Contractors cost for Contract Documents and for the moving of personnel, equipment, supplies and incidentals to the project site. This item shall include obtaining all permits required for the project; excluding any permits already obtained by the County of Tulare. Permit fees and all other permit preparation costs shall be included in this bid item. This item shall include additional costs associated with SWPPP and DCP preparation and implementation, worker protection, traffic control and miscellaneous facilities and operations. This item also includes demobilization, including removal of all equipment supplies, personnel, and incidentals from the project site at the end of construction.

The lump sum payment shall include the cost of mobilization, all necessary bonds, insurance, permits, licenses, fees required during the performance of the work, and demobilization. All costs associated with this item shall be included in the lump sum price and no additional payment will be made. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of contract work completed.

**Bid Item No. 30 - Clearing & Grubbing**

This bid item is a lump sum bid for the cost of all work involved in clearing and grubbing the storage tank site. Areas shall be stripped of surface vegetation, including clearing and grubbing of all trees, vines, stumps, roots, concrete, fencing, debris and unsuitable material, within the project site area including fill slopes, temporarily stockpiling unsuitable material during construction and related work.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.

**Bid Item No. 31 - Site Grading**

This bid item is a lump sum bid for the cost of all earthwork associated with rough and finish grading, including but not limited to, excavation (not including onsite drainage basin), importing borrow (if required) and exporting and disposing of excess and unsuitable material, over excavation and subgrade preparation and compaction, grading drainage swales, placing and compacting engineered fill to the lines and grades shown on the Plan.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications.
specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 32 - Chain Link Fence & Access Gates**

This bid item is a lump sum bid for all work associated with furnishing and installing an estimated quantity of chain link fence, including 6-foot chain link fence, two (2) rolling drive gates with privacy slates and three equally spaced strands of barbed wire and all appurtenances required to enclose the site as specified in the Plans and Specifications.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Add Alternate No. 2 Bid Items**

**Bid Item No. 33 - Mobilization, Bonds, and Insurance**

This item shall be bid a lump sum for Mobilization and Demobilization for all work associated with the Add Alternate No. 2 (Storage Tank Site in Seville) and shall conform to the provisions of Section 11 of the Caltrans Standard Specifications and these Specifications.

This item shall consist of covering the Contractors cost for Contract Documents and for the moving of personnel, equipment, supplies and incidentals to the project site. This item shall include obtaining all permits required for the project; excluding any permits already obtained by the County of Tulare. Permit fees and all other permit preparation costs shall be included in this bid item. This item shall include additional costs associated with SWPPP and DCP preparation and implementation, worker protection, traffic control and miscellaneous facilities and operations. This item also includes demobilization, including removal of all equipment supplies, personnel, and incidentals from the project site at the end of construction.

The lump sum payment shall include the cost of mobilization, all necessary bonds, insurance, permits, licenses, fees required during the performance of the work, and demobilization. All costs associated with this item shall be included in the lump sum price and no additional payment will be made. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of contract work completed.

**Bid Item No. 34 - Clearing and Grubbing**

This bid item is a lump sum bid for the cost of all work involved in clearing and grubbing the storage tank site. Areas shall be stripped of surface vegetation, including clearing and grubbing of all trees, vines, stumps, roots, concrete, fencing, debris and unsuitable material, within the project site area including fill slopes, temporarily stockpiling
unsuitable material during construction and related work.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.

**Bid Item No. 35 - Site Grading**

This bid item is a lump sum bid for the cost of all earthwork associated with rough and finish grading, including but not limited to, excavation (not including onsite drainage basin), importing borrow (if required) and exporting and disposing of excess and unsuitable material, over excavation and subgrade preparation and compaction, grading drainage swales, placing and compacting engineered fill to the lines and grades shown on the Plan. This bid item shall include excavation of onsite storm drain pond.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 36 - Chain Link Fence & Access Gates**

This bid item is a lump sum bid for all work associated with furnishing and installing an estimated quantity of chain link fence, including 6-foot chain link fence, two (2) rolling drive gates with privacy slates and three equally spaced strands of barbed wire and all appurtenances required to enclose the site as specified in the Plans and Specifications.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 37 - Standby Portable Generator**

This bid item is a lump sum bid a standby portable generator and controls, including but not limited to, furnishing and installing standby portable generator, and all appurtenances, testing, and start up. The portable generator shall be delivered to the job site at the location specified by the County.

The Contractor shall submit an application to the San Joaquin Valley Air Pollution Control District, upon approval of the generator submittal by the Engineer, and upon
an Authority to Construct (ATC) permit on behalf of the Owner. The Contractor is responsible for paying all fees associated with obtaining said permit.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete standby generator and appurtenances in conformance with the Plans and Specifications, San Joaquin Valley Air Pollution Control District requirements and as directed by the Engineer. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of work completed under this bid item.

### Add Alternate No. 3 Bid Items

#### Bid Item No. 38 - Mobilization, Insurance & Bonds

This item shall be bid a lump sum for Mobilization and Demobilization for all work associated with the Add Alternate No. 3 (Storage Tank Site in Seville) and shall conform to the provisions of Section 11 of the Caltrans Standard Specifications and these Specifications.

This item shall consist of covering the Contractor's cost for Contract Documents and for the moving of personnel, equipment, supplies and incidentals to the project site. This item shall include obtaining all permits required for the project; excluding any permits already obtained by the County of Tulare. Permit fees and all other permit preparation costs shall be included in this bid item. This item shall include additional costs associated with SWPPP and DCP preparation and implementation, worker protection, traffic control and miscellaneous facilities and operations. This item also includes demobilization, including removal of all equipment supplies, personnel, and incidentals from the project site at the end of construction.

The lump sum payment shall include the cost of mobilization, all necessary bonds, insurance, permits, licenses, fees required during the performance of the work, and demobilization. All costs associated with this item shall be included in the lump sum price and no additional payment will be made. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of contract work completed.

#### Bid Item No. 39 - Clearing & Grubbing

This bid item is a lump sum bid for the cost of all work involved in clearing and grubbing the storage tank site. Areas shall be stripped of surface vegetation, including clearing and grubbing of all trees, vines, stumps, roots, concrete, fencing, debris and unsuitable material, within the project site area including fill slopes, temporarily stockpiling unsuitable material during construction and related work.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of contract work completed.
completed.

Bid Item No. 40 - Site Piping, Valves and Appurtenances

This bid item is a lump sum bid for furnishing and installing all site piping and fittings, including but not limited to, sample taps, accessory piping and tubing, 2-inch water service assembly, concrete and adjustable pipe supports, valves and valve boxes, backflow preventer, eye wash, gages, taps, HDPE onsite utility water pipe and hose bibbs, flow meter (including transmitters, power supply, and indicators), storm drain pipe and inlet, storm drain rock outlet, and appurtenances from the pump discharge to the new distribution system pipe point of connection in County right of way (located at approximately Station 172+15) and the fill pipe from new distribution system pipe in County right of way to the storage tank, as detailed on the Plans and specified herein. This item includes pipe coating and all testing (compaction, pressure, bacteriological) associated with the site piping. Including all other work as specified in the Plans and Specifications.

If Add Alternate No. 3 is awarded, the blind flanges at the point of connection to the 8-inch water main in Madera Street shall be eliminated from the contract under this bid item.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of work completed under this bid item.

Bid Item No. 41 - 211,000-Gallon Water Storage Tank

This bid item includes furnishing and installing a 211,000 gallon bolted steel storage tank, appurtenances, and foundation complete in place, and shall be full compensation for tank and foundation design; furnishing all labor, equipment and materials to complete the installation, including: over excavation, preparation of earthwork and foundation construction, import fill material for sub grade and foundation, tank construction, ladders, hatches, gauges, vents and other tank accessories, painting, testing, and disinfection. Completed item shall provide a complete and fully operational 211,000-gallon storage tank, foundations, & appurtenances.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this item.

Bid Item No. 42 - High Service Pump Station

This bid item includes furnishing and installing four (4) horizontal end-suction pumps, including associated controls, appurtenances, above ground pipes and fittings, valves, pressure switches and gages, pipe supports, anchorages, reinforced concrete slab
foundation, piping connections, testing, and shall be full compensation for furnishing all labor, equipment, and materials to complete the installation as indicated in the Plans and Specifications. Completed item shall provide a complete and fully operational pump station, & appurtenances.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 43 - Hydro-Pneumatic Tank**

This bid item includes furnishing and installing new hydro-pneumatic tank, including associated pressure transmitter, air compressor, and appurtenances, above and below ground pipes and fittings, valves, reinforced concrete foundation footings, piping connections, testing, and shall be full compensation for furnishing all labor, equipment, and materials to complete the installation as indicated in the Plans and Specifications.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 44 - Chlorination Equipment and Enclosure**

This bid item includes chemical tank and metering pump, conduits and tubing, injection tap, valves and accessories, drum pump, hand truck, equipment enclosure and concrete pad, sodium hypochlorite solution for start-up testing, and all appurtenances including electrical connections and wiring required to provide a complete system for injection of sodium hypochlorite solution as indicated in the Plans and these Specifications.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 45 - Site Grading**

This bid item is a lump sum bid for the cost of all earthwork associated with rough and finish grading, including but not limited to, excavation (not including onsite drainage basin), importing borrow (if required) and exporting and disposing of excess and unsuitable material, over excavation and subgrade preparation and compaction, grading drainage swales, placing and compacting engineered fill to the lines and
grades shown on the Plan. This bid item shall include excavation of onsite storm drain pond.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 46 - Class 2 Aggregate Base Surfacing**

This bid item is a lump sum bid for all work associated placing Class 2 Aggregate Base Surfacing on the site as shown on the Plans. Work in this bid item shall include, but is not limited to, subgrade preparation, placing and compacting aggregate base to the lines and grades shown on the Plans.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 47 - Chain Link Fence & Access Gates**

This bid item is a lump sum bid for all work associated with furnishing and installing an estimated quantity of chain link fence, including 6-foot chain link fence, two (2) rolling drive gates with privacy slats and three equally spaced strands of barbed wire and all appurtenances required to enclose the site as specified in the Plans and Specifications.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer.

**Bid Item No. 48 - Electrical, Controls & Lighting**

This bid item is a lump sum bid for all work associated with all electrical equipment required for the well site, including, but not limited to main electrical service, instrumentation and controls, site lighting, site electrical, transformers, automatic transfer switch for standby generator, conduit and conductors for all work, all electrical connections, testing and startup. Reference is made to the Electrical Service Instructions in the Appendices of these Specifications.

This bid item includes all work associated with the Instructions from the Electrical Service Provider with exception to any work identified to be completed by the Electrical Service Provider. The Contractor shall furnish and install all electrical service facilities, including but not limited to conduit and transformer pad and bollards, in conformance with the Electrical Service Provider requirements. Installation of said electrical service...
facilities will be subject to review and approval by the Electrical Service Provider and the Engineer.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by a lump sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 49 - Standby Portable Generator**

This bid item is a lump sum bid a standby portable generator and controls, including but not limited to, furnishing and installing standby portable generator, and all appurtenances, testing, and start up. The portable generator shall be delivered to the job site at the location specified by the County.

The Contractor shall submit an application to the San Joaquin Valley Air Pollution Control District, upon approval of the generator submittal by the Engineer, and upon an Authority to Construct (ATC) permit on behalf of the Owner. The Contractor is responsible for paying all fees associated with obtaining said permit.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, San Joaquin Valley Air Pollution Control District requirements and as directed by the Engineer. This bid item shall be paid at the lump sum price bid. Payment will be prorated based on the percentage of work completed under this bid item.

**Bid Item No. 50 - Startup & Testing**

This bid item includes furnishing services associated with startup and testing. Completed bid item shall provide a complete and fully operational facility with complete integration between the wells and tank sites.

This bid item shall include furnishing and operating a temporary portable generator for startup, including providing fuel necessary for startup activities, in the event the new electrical service is not ready at the time of startup.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.
**Bid Item No. 51 - Operations & Maintenance Manuals**

This bid item includes preparing and furnishing an operations and maintenance manuals for all equipment at the Seville Storage Tank Site.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.

**Bid Item No. 52 - Recording Drawings**

This bid item includes preparing and furnishing record drawings for the Seville Storage Tank Site. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.

The bid item price shall include full compensation for furnishing all labor, tools, equipment and materials, along with all associated appurtenances required to complete the work under this bid item, in conformance with the plans and specifications, and as directed by the Engineer. This bid item will be paid for by Lump Sum on a prorated basis based on the percentage of work completed under this bid item.
PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT
In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has ___, has not ____ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term “bidder” is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1. Note: The bidder must place a checkmark after “has” or “has not” in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire: Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?
Yes ________    No ________

If the answer is yes, explain the circumstances in the following space.

_________________________________________________________

_________________________________________________________

_________________________________________________________

_________________________________________________________

(Signature) ____________________________________________
(Date) ____________________________

(Name and Title) ________________________________________

(Company Name) ________________________________________
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EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The bidder__________________________________________, and proposed subcontractor ___________________________, hereby certifies that he has ___ , has not , participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filling requirements.

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.
In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor’s failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board. Note: The above Statement and Questionnaire are part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement and Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

(Signature) (Date)

(Name and Title)

(Company Name)
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DEBARTMENT AND SUSPENSION CERTIFICATION TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

• is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
• has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
• does not have a proposed debarment pending; and
• has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

________________________________________________________

________________________________________________________

________________________________________________________

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

________________________________________________________

(Signature)  (Date)

________________________________________________________

(Name and Title)

________________________________________________________

(Company Name)
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9. BID GUARANTEE
   A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within seven (7) calendar days after a written Notice of Award, if offered within ten (10) calendar days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier’s check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting ten percent (10%) of the Base Bid amount above:

   B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier’s check, certified check, U.S. money order, or bid bond.

10. CERTIFICATIONS AND BASE BID
   A. Base Bid Single-Prime (All Trades) Contact: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications and all subsequent Addenda, as prepared by Arrington Watkins Architect and Architect’s consultants, having visited the site and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents for the stipulated sum of:

      (Words) ________________________________________________________________________________

      ________________________________________________________________________________ Dollars

      ($ ____________________________ )
11. **TIME OF COMPLETION**  
   A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed is received by the Contractor, and shall fully complete the Work within 190 calendar days if the Base Bid or the Base Bid and Add Alternate No. 1 are awarded or 250 calendar days if the Base Bid and Add Alternate No. 2 or 3 are awarded.

12. **CONTRACTOR’S LICENSE**  
   A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in the State of California, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

13. **REGISTRATION WITH DIR**  
   A. The undersigned further states that it is currently registered as a public works contractor with the DIR pursuant to California Labor Code section 1725.5 and qualified to perform public work projects.
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14. SUBMISSION OF BID

A. Respectfully submitted this ___ day of ____________, 2018

B. Submitted By:___________________________________________________________
   (Name of bidding firm or corporation)

C. Authorized Signature:_______________________________________________
   (Handwritten signature)

D. Signed By:___________________________________________________________
   (Type or print name)

E. Title: __________________________________________________________________
   (Owner/Partner/President/Vice President)

F. Type of Organization:___________________________________________________

G. Witnessed By:_________________________________________________________
   (Handwritten signature)

H. Attest:_______________________________________________________________
   (Handwritten signature)

I. Witnessed By:_________________________________________________________
   (Handwritten signature)

J. By:_______________________________________________________________
   (Type or print name)

K. Title:_______________________________________________________________
   (Corporate Secretary or Assistant Secretary)

L. Street Address:________________________________________________________

M. City, State, Zip:_____________________________________________________

N. Phone:______________________________________________________________

O. License No.:________________________________________________________

P. Federal ID No.:_______________________________________________________

Attachments:

--- Bid Security
--- Sub-contractor List
--- Non-Collusion Declaration
--- Corporate Resolution authorizing Signature of Document (if Corporation)
--- Public Contract Code Section 10285.1 Statement
--- Public Contract Code 10232 Statement
--- Debarment and Suspension Certification
--- Addenda Acknowledgement
--- Disclosure of Lobbying Activities
--- Certification of Exclusion of Builder’s Risk Insurance

Contractor License:

DIR Registration No.:__________________________

Class:________________________________________

Numbers:______________________________________

Expiration Dates:___________________________

Seal (if Corporation)
This attachment to the Bid Form shall be submitted with the Bid Form, in the sealed Bid envelope. If no subcontractors are to be involved and work is to be performed by the Contractor, so state.

In accordance with the provisions of Section 2-1.33C of the Caltrans Standard Specifications, California Public Contract Code section 4104, and Labor Code section 1771 et seq., each bidder shall list below the name and location of place of business of each subcontractor who will perform a portion of the contract work in an amount in excess of one-half of one percent of the total bid or $10,000, whichever is greater, as well as the subcontractor’s Department of Industrial Relations’ (“DIR”) registration number, along with each subcontractor’s contractor’s license number (“CSLB #”). In each instance, the nature and extent of the work to be sublet shall be described. On the Subcontractor List, you must submit each subcontracted bid item number and corresponding percentage with your bid. Failure to submit a properly completed Subcontractor List form may result in a non-responsive bid. Note: (1) pursuant to Public Contract Code Section 4104(a)(2), an inadvertent error in listing the California contractor license number provided pursuant to this paragraph shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the corrected contractor’s license number is submitted to the County by the prime contractor within 24 hours after the bid opening and provided the corrected contractor’s license number corresponds to the submitted name and location for that subcontractor; (2) pursuant to Labor Code Section 1771.1(c), an inadvertent error in listing a subcontractor who is not registered with the DIR in a bid proposal shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive, provided that any of the following apply:

1. The subcontractor is registered prior to the bid opening.
2. Within 24 hours after the bid opening, the subcontractor is registered and has paid the penalty registration fee specified in subparagraph (E) of paragraph (2) of subdivision (a) of Labor Code Section 1725.5.
3. The subcontractor is replaced by another registered subcontractor pursuant to Section 4107 of the Public Contract Code.

The General Contractor to whom the contract is awarded will not be permitted, without the written consent of the Tulare County Director of the Resource Management Agency or designee, to substitute any person as subcontractor in place of the subcontractor designated in the original bid, or to permit any subcontract to be assigned or transferred, or to allow it to be performed by anyone other than the original subcontractor. Consent to the substitution of another person as subcontractor shall only be permitted in accordance with Public Contract Code Section 4107.

The failure of the Contractor to specify a subcontractor for any portion of the contract work in excess of one-half of one percent of the total contract price shall be deemed to indicate that the Contractor intends to perform such portion itself. The subletting or subcontracting of work for which no subcontractor was designated in the original bid and which is in excess of one-half of one percent of the total contract price, will be allowed only in accordance with Public Contract Code Section 4109.
BIDDER'S LIST OF SUBCONTRACTORS
(Use other side & extra sheets if necessary)

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<tr>
<th>Subcontractor Information</th>
<th>Work Portion</th>
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<td>Name</td>
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<td>Address</td>
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<td>DIR Number</td>
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<td>CSLB No.</td>
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<td>Bid Item Description</td>
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<td>% of Bid Item</td>
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(Subcontractor List continued)

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<th>Subcontractor Information</th>
<th>Work Portion</th>
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<td>Name</td>
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Date: ____________________________________  Contractor's Signature: ________________

UNOFFICIAL
SECTION 000316 - NON COLLUSION DECLARATION AND CERTIFICATION OF EXCLUSION OF BUILDER’S RISK INSURANCE COST

NONCOLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Public Contract Code Section 7106)

The undersigned declares:

I am the ______________________ of ___________________________, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid.

The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on

_______________________ [date], at ______________________________ [city],
_______________________ [state].

_______________________

(signature)

_______________________

(Print name and Title)
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Certification of Exclusion of Builder’s Risk Insurance Cost

Contractor hereby certifies that it has read the provisions of the bid documents addressing the Builder’s Risk Insurance and is aware that the County will provide Builder’s Risk coverage for this project. The contractor shall exclude from its bid the cost of Builder’s Risk coverage as described more fully in the bid documents, Section 00700 Article 11.

Dated:

[Signature]

Contractor
SECTION 000501 - BID BOND

COUNTY OF TULARE
STATE OF CALIFORNIA

BIDDER'S BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, __________________________________________________________________________________
__________________________________________________________________________ as PRINCIPAL, and
_____________________________________________________________________________________________
_____________________________________________________________________ as SURETY, are held and
firmly bound unto the County of Tulare, hereinafter called the Obligee, in the penal sum of TEN
PERCENT (10%) OF THE TOTAL BASE AMOUNT OF THE BID of the Principal above named, submitted
by said Principal to the Board of Supervisors, County of Tulare, for the work described below, for
the payment of which sum in lawful money of the United States, well and truly to be made, we
bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by
these presents. In no case shall the liability of the surety hereunder exceed the sum of
$__________________.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas, the Principal has submitted the
above-mentioned bid to the Board of Supervisors, County of Tulare, for certain construction
specifically described as follows, for which bids are to be opened at Visalia, California, on
Thursday, March 22, 2018, for construction on the Tulare County - Yettem and Seville Water
System Project (Phase 1).

NOW, THEREFORE, if the aforesaid Principal is awarded the Contract, given the required notice
of award and presented with the County-Contractor Agreement for signature, and, within the
time and manner required under the Specifications, executes and files it with the Clerk of the
Board of Supervisors in the prescribed form and in accordance with the bid, together with all
insurance certificates, bonds, powers of attorney, certificates of authority and financial
statements, proofs of licensing, and any other documents required by the Specifications to be
filed with the executed Agreement, then this obligation shall be null and void; otherwise, it shall
be and remain in full force and effect.

In the event suit is brought upon this bond by the Obligee and judgement is recovered, the
surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney’s
fee to be fixed by the Court.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this __________day of____________________, 2018.

_____________________________ (Seal)
_____________________________ (Seal)
_____________________________ (Seal)
Principal

_____________________________ (Seal)
_____________________________ (Seal)
_____________________________ (Seal)
Surety

Note: Signature of those executing for the surety must be properly acknowledged or notarized.
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SECTION 000502 – STATUTORY PERFORMANCE BOND

STATUTORY PERFORMANCE BOND PURSUANT TO
California Public Contract Code
Section 20129

KNOW ALL MEN BY THESE PRESENTS:

That, ___________________________ (Hereinafter called the Principal), as Principal and
__________________________, a corporation organized and existing under the laws of the State of
__________________, with its principal office in the City of _____________________________, (hereinafter called the
Surety), as Surety, are held and firmly bound unto the
COUNTY OF TULARE, (hereinafter called the Obligee) in
the amount of ____________________________________________ Dollars ($__________), for the
payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Agreement with the Obligee, dated the
_______________________________________________ day of __ _____________________________________,
to__________________________________________________________________________, which Agreement is hereby
referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THE OBLIGATION IS SUCH, that if said Principal shall faithfully perform and
fulfill all the undertakings, covenants, terms, and conditions of said Agreement during the original term of the
Agreement and any extension thereof, with or without notice to the Surety, and during the life of any
guarantee required under the Agreement, and shall also perform and fulfill all the undertakings, covenants,
terms, conditions and agreements of any and all duly authorized extensions or modifications of said
Agreement that may hereafter be made, notice of said extensions or modifications to the Surety being
hereby waived and will indemnify, defend and save harmless the Obligee, its governing board, officers,
agents and employees as required by the Agreement; then the above obligation shall be void. Otherwise,
said obligation shall remain in full force and effect.

Whenever Obligee declares Principal to be in default under the Agreement, then the Surety will remedy the
default pursuant to the Agreement, or will promptly do one of the following, at the Obligee’s option:

(1) Undertake through its agents or independent contractors, reasonably acceptable to the Obligee, to
complete the Project in accordance with all terms and conditions in the Agreement, including without
limitation, all obligations with respect to payments, warranties, guarantees, and liquidated damages, and
with no requirement for a “take-over” or similar agreement; or

(2) Permit the Obligee to complete the Project in any manner consistent with California law and
reimburse the Obligee for all costs it incurs in completing the Project, and in correcting, repairing, or replacing
any defects in materials, equipment or workmanship, which do not conform to the Agreement.

Surety expressly agrees that the Obligee may reject any contractor or subcontractor that Surety may propose
in fulfillment of its obligations in the event of default by the Principal. Surety will not utilize Principal in
completing the Project or accept a bid from the Principal for completion of the Work if the Obligee, when
declaring the Principal in default, notifies Surety of the Obligee’s objection to Principal’s further participation in
the completion of the Project.

Surety’s obligations hereunder are independent of the obligations of any other surety for the performance of
the construction work on this Project, and suit may be brought against Surety and such other sureties, jointly
and severally, or against any one or more of them, or against less than all of them without impairing the
Obligee’s rights against the others.

PERFORMANCE BOND

000502-1
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No right of action will accrue on this bond to or for the use of any person or corporation other than the Obligee or its successors or assigns. If Obligee sues upon this bond, then Surety will pay reasonable attorney’s fees and costs incurred by the Obligee in such suit, irrespective of the penal amount of this bond.

Witness our hands this ______________ day of ____________________ 20. 

Principal

By

Surety

By

Agency of Record

Note: Bond surety must be admitted to transact surety insurance in the State of California
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That, ______________________________ (hereinafter called the Principal), as Principal, and ______________________________, a corporation organized and existing under the laws of the State of ______________________________, with its principal office in the City of ______________________________, (hereinafter called the Surety), as Surety, are held and firmly bound unto the COUNTY OF TULARE (hereinafter called the Obligee), in the amount of ______________________________ Dollars ($ ___________), for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Agreement with the Obligee, dated the ______________________________ day of ______________________________, to construct a Transit Operations and Maintenance Facility which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, its heirs, executors, administrators, successors, or assigns, or subcontractor, shall fail to pay any person or persons named in California Civil Code Section 9100; or fail to pay for any materials, provisions, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind; or shall fail to deduct, withhold, and pay over to the Employment Development Department, any amounts required to be deducted, withheld, and paid over by Unemployment Insurance Code Section 13020 with respect to work and labor thereon of any kind, then said Surety will pay for the same, in an amount not exceeding the amount herein above set forth, and in the event suit is brought upon this bond, also will pay such reasonable attorneys' fees as shall be fixed by the court, awarded and taxed as provided in California Civil Code Section 9550 et. seq.

This bond shall inure to the benefit of any person named in California Civil Code Section 9100 giving such person or his/her assigns a right of action in any suit brought upon this bond.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefor; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described; nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Obligee and the Principal or on the part of any obligee named in such bond; that the sole condition of recovery shall be that the claimant is a person described in California Civil Code Section 9100, and who has not been paid the full amount of his or her
claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

Witness our hands this ______________________ day of ______________________ 20

________________________________________
Principal                           Seal

________________________________________
By

________________________________________
Surety                           Seal

________________________________________
By

________________________________________
Agency of Record

________________________________________
Agency Address

Note: Bond surety must be admitted to transact surety insurance in the State of California.
STATE OF CALIFORNIA )  SS.
COUNTY OF TULARE )

The undersigned is aware of the provisions of Section 3700 of the Labor Code of the State of California which require every employer to be insured against liability of worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and the undersigned will comply with such provisions, and will require all subcontractors to comply with such provisions, before commencing the performance of the work of this Contract.

___________________________________
Date

___________________________________
Contractor's Signature
AGREEMENT BETWEEN COUNTY AND CONTRACTOR

AGREEMENT

made as of the ____ day of ________________ in the year of Two Thousand and Eighteen

BETWEEN the County: COUNTY OF TULARE, STATE OF CALIFORNIA

and the Contractor: _________________________________________________________

The Project: Tuleare County - Water System Improvements for Yettem and Seville (Phase 1)

The County’s Representative: Ross Miller – Chief Engineer - County of Tulare

The Engineer: Matthew Kemp – Provost and Pritchard

The County and the Contractor agree as set forth below.

ARTICLE 1
THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, the General Conditions and those documents enumerated in Section 000700 General Conditions, Article 1, Sub-paragraph 1.1.1, which documents are hereby incorporated into this Agreement and made a part hereof.

ARTICLE 2
THE WORK

The Contractor shall perform all the Work required by the Contract Documents for the Tulare County – Water System Improvements for Yettem and Seville (Phase 1).

ARTICLE 3
TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The Work to be performed under this Contract shall be commenced within Ten (10) calendar days after the date the Notice to Proceed is received by the Contractor and, subject to authorized adjustments, Substantial Completion of the Work Shall be achieved not later than 190/250 calendar days after the date established in the Notice to Proceed.

If Contractor fails to complete the Work within the Contract Time, Contractor shall pay to County, as liquidated damages and not as a penalty, the sum of $1990.00 for each day after the expiration
of the Contract Time that the Work remains incomplete. County and Contractor agree that if the Work is not completed within the Contract Time, then County’s damages would be extremely difficult or impracticable to determine and that the aforesaid amount is a reasonable estimate of the reasonable sum for such damages. County may deduct any liquidated damages due from Contractor from any amounts otherwise due to Contractor under the Contract Documents. This provision shall not limit any right or remedy of County in the event of any other default of Contractor other than failing to complete the Work within the Contract Time.

ARTICLE 4
CONTRACTSUM

The County shall pay the Contractor in current funds for the performance of the Work, subject to additions and deductions by Change Order or as otherwise provided in the Contract Documents, the Sum of __________________________________________________________________________________.

ARTICLE 5
PROGRESS PAYMENTS

Based upon Applications for Payment submitted to the County by the Contractor and Project Certificates for Payment issued by the County’s Representative, the County shall make progress payments on account of the Contract Sum to the Contractor as provided in the Contract Documents as follows:

Progress Payments: The Contractor shall, on or before the first day of each month, make an estimate of the work performed during the preceding month and submit same to the County’s Representative for checking and approval. On or about the 20th day of the month, following the month in which the work was performed, the County shall pay to the Contractor ninety-five (95%) percent of the value of said work in place, as checked and approved by the County’s Representative. The balance of five (5%) percent of the estimate shall be retained by the County until the time of final acceptance of said work.

ARTICLE 6
FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be paid by the County to the Contractor when the Work has been completed; the Contract fully performed, the County’s Representative has issued a Project Certificate for Payment, which approves the final payment due the Contractor and the Board of Supervisors of Tulare County has formally accepted the project as complete by Resolution.

ARTICLE 7
MISCELLANEOUS PROVISIONS

7.1 Terms used in this Agreement, which are defined in the “GENERAL CONDITIONS” of the contract shall have the meanings designated in those Conditions.
7.2 Notices shall be addressed as follow:

COUNTY

Resource Management Agency
County of Tulare
County Civic Center
5961 S. Mooney Blvd.
Visalia, CA 93291
(559) 624-7000

CONTRACTOR

7.3 PREVAILING WAGES. The Contractor agrees that State Prevailing Wages apply to this Project, and that the Contractor will pay the rates for each trade or craft and shall require the subcontractors on the project to pay the rates for each trade and craft. The State Wage Determinations are on file with the Clerk of the Board of Supervisors, Administration Building, County Civic Center, Visalia, California, and will be made available to any interested person on request; and the Payroll Submittal Information attached hereto as Section 00508 are incorporated herein as if set forth in full and are a part of this Contract. The Contractor agrees to repay the County any and all amounts paid to any subcontractor in violation of Public Contract Code Section 6109.

7.4 COMPLIANCE WITH LAW: CONTRACTOR shall provide services in accordance with applicable Federal, State, and local laws, regulations and directives. With respect to CONTRACTOR'S employees, CONTRACTOR shall comply with all laws and regulations pertaining to wages and hours, state and federal income tax, unemployment insurance, Social Security, disability insurance, workers' compensation insurance, and discrimination in employment.

7.5 RECORDS AND AUDIT: CONTRACTOR shall maintain complete and accurate records with respect to the services rendered and the costs incurred under this Agreement. In addition, CONTRACTOR shall maintain complete and accurate records with respect to any payments to employees or subcontractors. All such records shall be prepared in accordance with generally accepted accounting procedures, shall be clearly identified, and shall be kept readily accessible. Upon request, CONTRACTOR shall make such records available within Tulare County to the Auditor of Tulare County and to his agents and representatives, for the purpose of auditing and/or copying such records for a period of five (5) years from the date of final payment under this Agreement.

7.6 INDEPENDENT CONTRACTOR STATUS:

a. This Agreement is entered into by both parties with the express understanding that CONTRACTOR will perform all services required under this Agreement as an independent contractor. Nothing in this Agreement shall be construed to constitute the CONTRACTOR or any of its agents, employees or officers as an agent, employee or
officer of COUNTY.

b. CONTRACTOR agrees to advise everyone it assigns or hires to perform any duty under this agreement that they are not employees of COUNTY. Subject to any performance criteria contained in this Agreement, CONTRACTOR shall be solely responsible for determining the means and methods of performing the specified services and COUNTY shall have no right to control or exercise any supervision over CONTRACTOR as to how the services will be performed. As CONTRACTOR is not COUNTY’S employee, CONTRACTOR is responsible for paying all required state and federal taxes. In particular, COUNTY will not:

i. Withhold FICA (Social Security) from CONTRACTOR’S payments.

ii. Make state or federal unemployment insurance contributions on CONTRACTOR’S behalf.

iii. Withhold state or federal income tax from payments to CONTRACTOR.

iv. Make disability insurance contributions on behalf of CONTRACTOR.

v. Obtain unemployment compensation insurance on behalf of CONTRACTOR.

c. Notwithstanding this independent contractor relationship, COUNTY shall have the right to monitor and evaluate the performance of CONTRACTOR to assure compliance with this Agreement.

7.7 INDEMNIFICATION AND DEFENSE:

a. To the fullest extent permitted by law, CONTRACTOR must indemnify, defend (at CONTRACTOR’S sole cost and expense and with legal counsel approved by COUNTY, which approval may not be unreasonably withheld), protect and hold harmless COUNTY, all subsidiaries, divisions and affiliated agencies of COUNTY, all of their representatives, partners, designees, officers, directors, employees, consultants, agents, successors and assigns, (each, an “Indemnified Party” and collectively, the “Indemnified Parties”), from and against all claims (including, without limitation, claims for bodily injury, death or damage to property), demands, obligations, damages, actions, causes of action, suits, losses, judgments, fines, penalties, liabilities, costs and expenses (including, without limitation, attorneys’ fees, disbursements and court costs, and all other professional expert or consultants’ fees and costs and COUNTY general and administrative expenses) of every kind and nature whatsoever (individually, a “Claim”; collectively, “Claims”) which may arise out of, pertain to, or relate (directly or indirectly) to the negligence, recklessness, or misconduct of CONTRACTOR with respect to any work performed or services provided under this Agreement (including, without limitation, the acts, errors and/or omissions of CONTRACTOR, its principals, officers, agents, employees, vendors, suppliers, consultants, sub-consultants, contractors, anyone employed directly or indirectly by any of them or for whose acts they may be liable or any or all of them). CONTRACTOR’S obligation to indemnify applies unless it is finally adjudicated that the liability was caused by the sole active negligence or sole willful misconduct of an Indemnified Party. If it is finally adjudicated that liability is caused by the comparative active negligence or willful misconduct of an Indemnified Party, then CONTRACTOR’S indemnification obligation shall be reduced in proportion to the established comparative liability.

b. The duty to defend is a separate and distinct obligation from CONTRACTOR’S duty
to indemnify. CONTRACTOR shall be obligated to defend, in all legal, equitable, administrative, or special proceedings, the Indemnified Parties immediately upon tender to CONTRACTOR of the Claim in any form or at any stage of an action or proceeding, whether or not liability is established. Payment to CONTRACTOR by any Indemnified Party or the payment or advance of defense costs by any Indemnified Party cannot be a condition precedent to enforcing the Indemnified Party's rights to indemnification under this Agreement. An allegation or determination that persons other than CONTRACTOR are responsible for the Claim does not relieve CONTRACTOR from its separate and distinct obligation to defend under this section. The obligation to defend extends through final judgment, including exhaustion of any appeals. The defense obligation includes an obligation to provide independent defense counsel if CONTRACTOR asserts that liability is caused in whole or in part by the negligence or willful misconduct of an Indemnified Party. If it is finally adjudicated that liability was caused by the comparative active negligence or willful misconduct of an Indemnified Party, then CONTRACTOR may submit a claim to the COUNTY for reimbursement of reasonable attorneys' fees and defense costs in proportion to the established comparative liability of the Indemnified Party. CONTRACTOR'S indemnification obligations under this Agreement will survive the expiration or earlier termination of this Agreement until action against the Indemnified Parties for the matter indemnified is fully and finally barred by the applicable statute of limitations or statute of repose. CONTRACTOR’S liability for indemnification under this Agreement is in addition to any liability CONTRACTOR may have to COUNTY for a breach by CONTRACTOR of any of the provisions of this Agreement. Under no circumstances may the insurance requirements and limits set forth in this Agreement be construed to limit CONTRACTOR'S indemnification obligation or other liability under this Agreement. The terms of this Agreement are contractual and the result of negotiation between the Parties.

c. CONTRACTOR must indemnify and hold COUNTY harmless from all loss and liability, including attorneys' fees, court costs and all other litigation expenses, for any infringement of the patent rights, copyright, trade secret or any other proprietary right or trademark, and all other intellectual property claims of any person or persons in consequence of the use by COUNTY, or any of its officers or agents, of articles or services to be supplied in the performance of this Agreement.

7.8 CONFLICT OF INTEREST:

a. CONTRACTOR agrees at all times in performance of this Agreement to comply with the law of the State of California regarding conflicts of interests or appearance of conflicts of interests, including, but not limited to Government Code Section 1090 et seq., and the Political Reform Act, Government Code Section 81000 et seq. and regulations promulgated pursuant thereto by the California Fair Political Practices Commission. The statutes, regulations and laws previously referenced include, but are not limited to, prohibitions against any public officer or employee, including CONTRACTOR for this purpose, from the making of any decision on behalf of COUNTY in which such officer, employee or consultant has a direct or indirect financial interest. A violation can occur if the public officer, employee or consultant participates in or influences any COUNTY decision which has the potential to confer any pecuniary benefit on CONTRACTOR or any business firm in which CONTRACTOR has an interest, with certain narrow exceptions.

b. CONTRACTOR agrees that if any facts come to its attention which raise any questions as to the applicability of conflicts of interests' laws, it will immediately inform the COUNTY designated representative and provide all information needed for resolution of this question.

7.9 ENTIRE AGREEMENT REPRESENTED: This Agreement represents the entire agreement
between CONTRACTOR and COUNTY as to its subject matter and no prior oral or written understanding shall be of any force or effect. No part of this Agreement may be modified without the written consent of both parties.

7.10 **HEADINGS:** Section headings are provided for organizational purposes only and do not in any manner affect the scope, meaning or intent of the provisions under the headings.

7.11 **CONSTRUCTION:** This Agreement reflects the contributions of both parties and accordingly the provisions of Civil Code section 1654 shall not apply to address and interpret any uncertainty.

7.12 **NO THIRD PARTY BENEFICIARIES INTENDED:** Unless specifically set forth, the parties to this Agreement do not intend to provide any other party with any benefit or enforceable legal or equitable right or remedy.

7.13 **GOVERNING LAW:** This Agreement shall be interpreted and governed under the laws of the State of California without reference to California conflicts of law principles. The parties agree that this contract is made in and shall be performed in Tulare County, California.

7.14 **WAIVERS:** The failure of either party to insist on strict compliance with any provision of this Agreement shall not be considered a waiver of any right to do so, whether for that breach or any subsequent breach. The acceptance by either party of either performance or payment shall not be considered to be a waiver of any preceding breach of the Agreement by the other party.

7.15 **EXHIBITS AND RECITALS:** The Recitals and the Exhibits to this Agreement are fully incorporated into and are integral parts of this Agreement.

7.16 **CONFLICT WITH LAWS OR REGULATIONS/SEVERABILITY:** This Agreement is subject to all applicable laws and regulations. If any provision of this Agreement is found by any court or other legal authority, or is agreed by the parties, to be in conflict with any code or regulation governing its subject, the conflicting provision shall be considered null and void. If the effect of nullifying any conflicting provision is such that a material benefit of the Agreement to either party is lost, the Agreement may be terminated at the option of the affected party. In all other cases the remainder of the Agreement shall continue in full force and effect.

7.17 **FURTHER ASSURANCES:** Each party will execute any additional documents and perform any further acts which may be reasonably required to effect the purposes of this Agreement.

7.18 **ASSURANCES OF NON-DISCRIMINATION:** CONTRACTOR shall not discriminate in employment or in the provision of services on the basis of any characteristic or condition upon which discrimination is prohibited by state or federal law or regulation.

7.19 **ASSIGNMENT/SUBCONTRACTING:** Unless otherwise provided in this Agreement, COUNTY is relying on the personal skill, expertise, training and experience of CONTRACTOR and CONTRACTOR’S employees and no part of this Agreement may be assigned or subcontracted by CONTRACTOR without the prior written consent of COUNTY.

7.20 **DISPUTE RESOLUTION:** If a dispute arises out of or relating to this Agreement, or the breach thereof, and if said dispute cannot be settled through negotiation, the parties
agree first to try in good faith to settle the dispute by non-binding mediation before resorting to litigation or some other dispute resolution procedure, unless the parties mutually agree otherwise. The mediator shall be mutually selected by the parties, but in case of disagreement, the mediator shall be selected by lot from among two nominations provided by each party. All costs and fees required by the mediator shall be split equally by the parties, otherwise each party shall bear its own costs of mediation. If mediation fails to resolve the dispute within 30 days, either party may pursue litigation to resolve the dispute.

7.21 **UNEMPLOYMENT INSURANCE COMPLIANCE:** CONTRACTOR acknowledges that this Agreement is subject to filing obligations pursuant to Unemployment Insurance Code Section 1088.8. Accordingly, COUNTY has an obligation to file a report with the Employment Development Department, which report will include the CONTRACTOR’S full name, social security number, address, the date this contract was executed, the total amount of the contract, the contract’s expiration date or whether it is ongoing. CONTRACTOR agrees to cooperate with COUNTY to make such information available and to complete DE Form 542. Failure to provide the required information may, at COUNTY’S option, prevent approval of this Agreement, or be grounds for termination by COUNTY.

7.22 **REDUCTION IN FUNDING:** Contractor expressly understands and agrees that COUNTY is dependent upon certain Federal and/or State and/or local funding to pay the services provided in this contract. If such Federal and/or State and/or local funding is discontinued or reduced, County shall have the right to terminate the contract. In either event County shall provide CONTRACTOR with at least 30 days prior written notice of such termination.

[REMAINDER OF PAGE INTENTIONALLY BLANK]
This Agreement entered into as of the day and year first written above.

COUNTY

CHAIRMAN, BOARD OF SUPERVISORS

SIGNATURE

Typed Name

Signature

Typed Name

COUNTY OF TULARE
2800 W. Burrel Ave.
Visalia, CA 93291

ATTEST: Michael C. Spata
County Administrative Officer/Clerk of
The Board of Supervisors of the
County of Tulare

BY: ________________________________

APPROVED AS TO FORM

______________________________
County Counsel

END OF SECTION 000506
INSTRUCTIONS:

1.1.1 THE GENERAL CONTRACTOR IS REQUIRED TO POST THE ATTACHED STATE WAGE DETERMINATION ON THE JOB SITE FOR THE PROJECT IN CONSPICUOUS LOCATION AVAILABLE TO ALL WORKERS.
GENERAL CONTRACTOR

IS REQUIRED

TO POST

THIS

STATE WAGE DETERMINATION

ON THE JOB SITE

FOR THE PROJECT:

WATER SYSTEM IMPROVEMENTS FOR YETTEM AND SEVILLE (PHASE 1) - TULARE COUNTY

END OF SECTION 000507
SECTION 000508 - PAYROLL SUBMITTAL INFORMATION

1.1 INSTRUCTIONS FOR PAYROLL SUBMITTALS

1.1.1 UPON REQUEST, THE GENERAL CONTRACTOR WILL PROVIDE TO TULARE COUNTY ANY RECORDS REQUESTED FOR PAYROLL ON THIS PROJECT WITHIN 48 HOURS INCLUDING BUT NOT LIMITED TO:

A. Name, Address, Social Security Number and Ethnic Code of Employee or Employees.

B. Number of Withholding Exemptions.

C. Work Classification.

D. Day, Date and Hours Worked.

E. Total Hours.

F. Rate of Pay.

G. Gross Pay.

H. Deductions.

I. Net Wages Paid.
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END OF SECTION 000508
CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT
(Civil Code Section 8132)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information

Name of Claimant: ________________________________

Name of Customer: County of Tulare

Job Location: Community of Seville, CA

Owner: County of Tulare

Through Date: ________________________________

Conditional Waiver and Release
This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant’s receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: County of Tulare

Amount of Check: $ ________________________________

Check Payable to: ________________________________

Exceptions
This document does not affect any of the following:
(1) Retentions.
(2) Extras for which the claimant has not received payment.
(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:
   Date(s) of waiver and release: ________________________________
   Amount(s) of unpaid progress payment(s): $ ________________________________
(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature
Claimant’s Signature: ________________________________

Claimant’s Title: ________________________________

Date of Signature: ________________________________

WAIVERS AND RELEASE FORMS 000509 - 1
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UNCONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT
(Civil Code Section 8134)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Identifying Information

Name of Claimant: ________________________________

Name of Customer: County of Tulare

Job Location: Community of Seville, CA

Owner: County of Tulare

Through Date: ________________________________

Unconditional Waiver and Release
This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: $

Exceptions
This document does not affect any of the following:
(1) Retentions
(2) Extras for which the claimant has not received payment.
(3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature

Claimant’s Signature: ________________________________

Claimant’s Title: ___________________________________

Date of Signature: ________________________________

WAIVERS AND RELEASE FORMS

000509 - 3
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CONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT
(Civil Code Section 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT’S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant: ____________________________________________

Name of Customer: County of Tulare

Job Location: Community of Seville, CA

Owner: County of Tulare

Through Date: ____________________________________________

Conditional Waiver and Release
This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant’s receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: County of Tulare

Amount of Check: $ ____________________

Check Payable to: ____________________________________________

Exceptions
This document does not affect any of the following:
Disputed claims for extras in the amount of: $ ____________________

Signature
Claimant’s Signature: ____________________________________________

Claimant’s Title: ____________________________________________

Date of Signature: ____________________________________________
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UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT
(Civil Code Section 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Identifying Information

Name of Claimant: ____________________________________________________________

Name of Customer: County of Tulare

Job Location: Community of Seville, CA

Owner: County of Tulare

Through Date: __________________________

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following:
Disputed claims for extras in the amount of: $ ________________________________

Signature

Claimant’s Signature: _______________________________________________________

Claimant’s Title: ___________________________________________________________

Date of Signature: _______________________________________________________
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END OF SECTION 000509
# TABLE OF ARTICLES

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CONTRACT DOCUMENTS</td>
<td>000700-2</td>
</tr>
<tr>
<td>2</td>
<td>ADMINISTRATION OF THE CONTRACT</td>
<td>000700-11</td>
</tr>
<tr>
<td>3</td>
<td>COUNTY</td>
<td>000700-14</td>
</tr>
<tr>
<td>4</td>
<td>CONTRACTOR</td>
<td>000700-15</td>
</tr>
<tr>
<td>5</td>
<td>SUBCONTRACTORS</td>
<td>000700-30</td>
</tr>
<tr>
<td>6</td>
<td>WORK BY COUNTY OR BY SEPARATE CONTRACTORS</td>
<td>000700-31</td>
</tr>
<tr>
<td>7</td>
<td>MISCELLANEOUS PROVISIONS</td>
<td>000700-33</td>
</tr>
<tr>
<td>8</td>
<td>TIME</td>
<td>000700-40</td>
</tr>
<tr>
<td>9</td>
<td>PAYMENTS AND COMPLETION</td>
<td>000700-45</td>
</tr>
<tr>
<td>10</td>
<td>PROTECTION OF PERSONS AND PROPERTY</td>
<td>000700-57</td>
</tr>
<tr>
<td>11</td>
<td>INSURANCE</td>
<td>000700-60</td>
</tr>
<tr>
<td>12</td>
<td>CHANGES IN THE WORK</td>
<td>000700-62</td>
</tr>
<tr>
<td>13</td>
<td>UNCOVERING AND CORRECTION OF WORK</td>
<td>000700-66</td>
</tr>
<tr>
<td>14</td>
<td>TERMINATION OF THE CONTRACT</td>
<td>000700-68</td>
</tr>
<tr>
<td>15</td>
<td>ADDITIONAL INSTRUCTIONS</td>
<td>000700-70</td>
</tr>
<tr>
<td>16</td>
<td>GUARANTEE</td>
<td>000700-80</td>
</tr>
</tbody>
</table>
ARTICLE 1
CONTRACT DOCUMENTS

1.1 DEFINITIONS

Whenever the following terms, titles, or phrases are used in the Contract Documents, the intent and meaning thereof shall be as defined in this article.

Addendum/Addenda.
“Addendum” or “Addenda” are written documents furnished by the County before award of the Contract, interpreting or modifying plans and specifications or answering questions of intended bidders, and shall be incorporated in and are a part of the Contract Documents.

Alternate.
The “Alternate” is the sum to be added to or deducted from the Base Bid if the change in scope of work as described in Alternates is accepted by the County.

Bid.
“Bid” shall mean the offer of the bidder to do the work, when submitted on the prescribed bid form, properly executed and bonded, at the designated time and location.

Change Order.
“Change Order” shall mean a written order to the Contractor, issued after execution of the Contract, authorizing a change in the Work and/or an adjustment in the Contract Sum and/or the Contract Time.

Closeout-Documents.
Documents as required to meet the requirements of final completion.

Contract.
The legally binding agreement between the County and the Contractor wherein the Contractor agrees to furnish the labor, materials, equipment, plant and appurtenances required to perform the work described in the Contract Documents and the County agrees to pay the Contractor for such work.

Construction Manager.
“Construction Manager” shall mean the firm or County employee engaged by the County as an agent to perform all functions delegated to the Construction Manager by the Contract Documents. The Construction Manager will be the Contractor’s primary contact during construction of the Project.

Construction Schedule.
The “Construction Schedule” is the schedule produced by the Contractor in response to the requirements shown in the Preliminary Bid Schedule.

The “Construction Administrative Procedures Manual” is the manual produced by the Construction Manager to describe the administrative procedures which will be used on the job-site during construction. This manual outlines administrative procedures which are described in detail in these General Conditions, as well as describing other administrative procedures which may be specific to the Project.

Contract - Documents.
The “Contract Documents” shall include the Advertisement for Bids, the Instructions for Bidders, the Proposal Form, the Agreement between County and Contractor, the Bid Bond, the Performance Bond, the Payment Bond, these General Conditions, the Special Provisions, the General Requirements, Exhibits, the Technical Specifications, the Contract drawings and plans, all duly issued Addenda, Modifications, Interpretations, and Change Orders, Supplemental Drawings, the Contractor’s Guarantee and Bond, the Construction Administrative Procedures Manual, the Subcontractor Listing, Preliminary Construction Schedule and the
Construction Schedule in its most recently updated and accepted version. A modification is a written amendment to the Agreement signed by both parties.

**Contract Drawings or Plans.**
The “Contract Drawings” (sometimes referred to as “drawings” or “plans”) are the plans and working drawings which show the location, character, dimensions and details of the Work to be performed, and all supplemental drawings issued by the County. Once approved, all such supplemental drawings are incorporated into and become a part of the Contract Documents.

**Contract Sum.**
“Contract Sum” is the total amount payable by the County to the Contractor for the performance of the Work under the Contract Documents. The Contract Sum is the amount stated in the Agreement for Construction, including authorized adjustments thereto.

**Contract Time.**
“Contract Time” shall mean the period specified for completion of the Work, as set forth in the Agreement for Construction and adjusted by any change order issued pursuant to the Contract Documents.

**Contractor.**
“The Contractor” shall mean the person or persons, partnership, or corporation, who have entered into the Agreement for Construction of the Work with the County or its legal representatives, or successors, assigns, executors, or heirs. The Contractor is required by law to be licensed as and will perform work or render services as a prime contractor.

**Date of Commencement.**
“Date of Commencement” is the date established in the Notice to Proceed. If there is no Notice to Proceed, it shall be the date of the Agreement for Construction or such other date as may be established therein.

**Date of Completion.**
The “Date of Completion” is the date certified by the Construction Manager when construction of the Work is 100% complete including acceptance by the Engineer of all punch list corrections.

**Day.**
Unless otherwise expressly defined, a “day” shall mean a calendar day of 24 hours, including each and every day of the year.

**Engineer.**
The “Engineer” is the consulting firm engaged as an agent by the County to perform the services set forth in the Contract Documents. The Engineer is designated by the Board of Supervisor’s as the County’s agent to perform all functions delegated to the Engineer by the Contract Documents.

**Engineer’s Instruction Bulletin.**
“Engineer’s Instruction Bulletins” are supplemental drawings or instructions which may be issued as necessary from time to time to make clear or define in greater detail the intent of the Contract Drawings and Specifications. There may be a change in Contract Sum or Contract Time involved with the work shown in the Bulletin.

**Equal (as in “or equal”).**
“Equal” shall mean a system, product or material which is similar in all respects to that shown or specified but produced by a manufacturer not listed in the specification. See also: Substitution.

**First Line Supervision.**
“First Line Supervision” shall mean a working foreman or lead craft worker other than the project superintendent.
**Inspector.**
The “Inspector” shall mean the person or persons employed or engaged as (an) independent contractor(s) by the County to inspect the performance of the Work by the Contractor for compliance with the Contract Documents. The County Inspector is hereby designated as an agent of the County for such purpose and no other. The County Inspector is supervised by, and reports to, the County. The authority of the County Inspector to monitor the work shall be strictly limited to that authority specified herein and in Title 24, California Code of Regulations, and no additional authority has been granted nor shall be inferred. The Engineer may be designated as the County Inspector, in which case the Engineer shall perform the function and have the authority of both positions.

**Interpretations.**
“Interpretations” are all clarifications, additional instructions, and explanations issued by the Engineer after award of the Contract.

**Materials.**
“Materials” is a generic term which shall include all building materials, articles, supplies, and equipment delivered to the project for incorporation in the Work. “Materials” includes everything incorporated into the Work except labor, unless otherwise noted.

**Equipment.**
“Equipment” shall mean all pre-manufactured or partially preassembled products or components, assembled or partially assembled before delivery to the site.

**Milestone Completion Date.**
The “Milestone Completion Date” is the date certified by the Construction Manager when construction of the Work or any phase of the Work is 100% complete including acceptance by the Engineer of all punch list corrections.

**Notice of Intent to Award.**
The “Notice of Intent to Award” is issued following County approval of bids. It authorizes the Contractor to obtain required bonds and insurance and to procure all materials and equipment necessary to fulfill its Contract within the time shown in the schedule.

**Notice to Proceed.**
“Notice to Proceed” is the notice given to the Contractor following execution of the Agreement for Construction and receipt of all required preconstruction submittals as itemized in the Notice of Intent to Award, which establishes the start of the Work and authorizes the Contractor to begin construction.

**Product Data.**
“Product Data” shall mean illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

**Project.**
“Project” shall mean the complete work of improvement referenced in the Contract Documents, of which the Work may be only a portion.

**Project Manual.**
“Project Manual” is the Introductory Information (Division 0), the General Requirements (Division 1) and the Project Specifications.

**Proposed Change Order (PCO).**
A “Proposed Change Order (PCO)” is the name given to a document issued by the Construction Manager
authorizing work to proceed on a change in anticipation of approval and issuance by the County of a Change Order.

Provide.
“Provide” shall mean to furnish, install, and connect complete and ready for use.

Reference to Codes.
Unless otherwise noted, all references to statutes are to the laws of the State of California as codified in the various specified codes.

Request for Proposal (RFP).
A “Request for Proposal” is the name given to a document issued by the Construction Manager requesting pricing information for a described scope of work.

Samples.
“Samples” shall mean physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

Shop Drawings.
“Shop Drawings” shall mean drawings, diagrams, schedules and other data specifically prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

Site.
“Site” is the area within which the Project is to be constructed.

Special Inspector.
The “Special Inspector” shall mean the person or persons employed or engaged as (an) independent contractor(s) by the County to inspect the performance of specific aspects of the work as required by Title 24, California Code of Regulations.

Special Provisions.
The “Special Provisions” are specific clauses setting forth conditions or requirements peculiar to the Work, and supplementary to the General Conditions and Technical Specifications.

Specifications.
“Specifications” include the special provisions, general conditions, general requirements, and technical specifications applicable to the Work, all duly executed and issued addenda and interpretations, and all modifications approved by the County pursuant to a change order.

Standard Specifications.
“Standard Specifications” shall mean work must be done under the 2010 Standard Specifications and Revised Standard Specifications 2010 dated 04-19-2013 of the Department of Transportation of the State of California.

Subcontractor.
“Subcontractor” shall mean each person or firm who is required by law to be and who is licensed to and will perform work, labor, or render services to the Contractor in or about the construction of the Work, or who, under subcontract to the Contractor, fabricates and installs a portion of the work or improvement.

“Subcontractor” shall include all persons or firms within the authority of the Subletting and Subcontracting Fair Practices Act, Chapter 4 of Division 2, Part I of the Public Contract Code, commencing with Section 4100.

Substitution.

GENERAL CONDITIONS
“Substitution” shall mean a system, process, product or material similar in form or function and equal in quality and performance to that shown or specified, but differing in some essential element, e.g., chemical composition, mechanism of action, surface finish, dimensions, durability, electrical or mechanical or plumbing requirements. See also: Equal.

Supply
“Supply” shall mean to furnish only, complete and ready for installation, including shipping, delivery, protection, and any assembly required prior to installation.

Tulare County Standard Specifications
“Tulare County Standard Specifications” shall mean work must be done under the Improvement Standards of Tulare County adopted January 16th, 1973 by the Tulare County Board of Supervisors and all revisions.

Work
The “Work” shall mean that scope of work included in this Contract.

1.1.1 THE CONTRACT DOCUMENTS
The “Contract Documents” shall include the Advertisement for Bids, the Instructions to Bidders, the Proposal Form, the Agreement between the County and Contractor, the Bid Bond, the Performance Bond, the Payment Bond, these General Conditions, the Special Provisions, the General Requirements, Exhibits, the Technical Specifications, the Contract drawings and plans, all duly issued Addenda, Modifications, Interpretations, and Change Orders, Supplemental Drawings, the Contractor’s Guarantee and Bond, the Construction Administrative Procedures Manual, the Subcontractor Listing, Preliminary Construction Schedule and the Construction Schedule in its most recently updated and accepted version. A modification is a written amendment to the Agreement signed by both parties.

1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Construction Manager and the Contractor, but the Construction Manager shall be entitled to performance of the obligations of the Contractor intended for its benefit and to enforcement thereof. Nothing contained in the Contract Documents shall create any contractual relationship between the County, the Construction Manager and any Subcontractor or Sub-subcontractor.

1.1.3 THE WORK
The Work comprises the completed construction required of the Contractor by the Contract Documents, and includes all labor, materials, equipment and services necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction for the Tulare County – Water System Improvements for Yettem and Seville (Phase 1).

1.1.4 THE PROJECT
The Project, as defined in the County-Contractor Agreement, is the total construction of which the Work performed under the Contract Documents is a part.

1.2 EXECUTION, CORRELATION, AND INTENT

1.2.1 Award of Contract – The County reserves the right to reject any or all proposals, or waive any discrepancy in a proposal. The decision of the County regarding the amount of a bid, or existence or treatment of a discrepancy in a bid will be final. The award of the Contract, if it is awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Such award, if made, will be made within 60 days after the opening of proposal. This period may be subject to an extension for such further period as may be agreed upon in writing between the County and the bidder concerned.

Basis of Award:
The successful bidder will be the bidder submitting the lowest responsive and responsible bid.

The following failures are not waiveable and will cause a bid to be considered non-responsive:
- Failure to sign the bid
- Failure to furnish the required bid bond on the County form provided, or a cashier’s check in an amount equal to 10% of the Bidder’s base bid
- Failure to include a total amount of the bid
- Failure to submit a completed addenda certification statement
- Failure to be named on the official County planholders list

The above list is not inclusive of all failures that the County will consider non-responsive, however the County reserves the right to waive other types of discrepancies or failures. The Tulare County Board of Supervisors decision or treatment regarding a bid will be final.

The Contract will be signed by the successful bidder and returned within ten (10) days, not including Saturday, Sunday or Tulare County legal holidays, after the bidder has received notice that the Contract has been awarded.

Any bid protest must be in writing and filed with the County’s Assistant Director of Public Works at the Resource Management Agency, 5961 S. Mooney Blvd., Visalia, CA 93277 before 5:00 p.m. no later than five working days following bid opening (the “Bid Protest Deadline”) and must comply with the following requirements:

A. General. Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors and material suppliers are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. For purposes of this Bid Protest Procedure, a “working day” means a day that County is open for normal business, and excludes weekends and holidays observed by County.

B. Protest Contents. The bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the person representing the protesting bidder if different from the protesting bidder.
C. Copy to Protested Bidder. A copy of the protest and all supporting documents must be concurrently transmitted by fax or by email, by or before the Bid Protest Deadline, to the protested bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

D. Response to Protest. The protested bidder may submit a written response to the protest, provided the response is received by County before 5:00 p.m., within two working days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the “Response Deadline”). The response must include all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person representing the protested bidder if different from the protested bidder.

E. Copy to Protesting Bidder. A copy of the response and all supporting documents must be concurrently transmitted by fax or by email, by or before the Bid Protest Deadline, to the protesting bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.

F. Exclusive Remedy. The procedure and time limits set forth in this section are mandatory and are the bidder’s sole and exclusive remedy in the event of bid protest. A bidder’s failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

G. Right to Award. The County Board of Supervisors reserves the right to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a notice to proceed with the Work notwithstanding any pending or continuing challenge to its determination.

The Contractor shall file with the signed Contract two bonds. These bonds shall be in the amount and for the purposes specified below. They shall be surety bonds and shall be issued by corporations duly and legally licensed to transact business in the State of California. They shall be maintained by the Contractor, at its expense, during the entire term of the Contract.

A Performance Bond shall be furnished in the amount of one hundred percent (100%) of the Contract price, and shall guarantee faithful performance of the Contract and shall insure the County during the life of the Contract and for the term of 3 years from the date of acceptance of the work against faulty or improper materials or workmanship that may be discovered during that time.

A Payment Bond shall be furnished in an amount not less than one hundred percent (100%) of the Contract price and shall guarantee the payment in full of all claims for labor and material in accordance with the provisions of Section 9550-9566 of the Civil Code of the State of California. The life of the Payment Bond shall extend to 30 days after notice of completion is recorded.

All bonds required, whether Bid Bonds, Performance, Payment or other Bonds, shall be issued by a California admitted surety insurer. The Bid Bond, Performance Bond and Payment Bond must be issued by the same admitted surety insurer. The Payment and Performance Bonds required by these specifications will neither be accepted nor approved by the County unless bonds are in the forms shown in Sections 502 and 503 of the specifications and are underwritten by an admitted surety. The County further reserves the right to satisfy itself as to the acceptability of the surety and the form of
bond. The Bidder may be required to submit the following documents:

1. The original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws, or other instrument authorizing the person who executed the bond to do so.

2. A certified copy of the certificate of authority of the insurer issued by the California Insurance Commissioner.

3. A certificate from the County Clerk that the certificate of authority has not been surrendered, revoked, canceled, annulled, or suspended, or in the event that it has, that renewed authority has been granted.

4. A financial statement of the assets and liabilities of the insurer to the end of the quarter calendar year prior to 30 days next preceding the date of the execution of the bond, in the form of an officers' certificate as defined in Corporations Code 173.

1.2.2 The Contract Documents shall be signed in not less than three original copies by the County and the Contractor.

1.2.3 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with the local conditions under which the Work is to be performed, and has correlated personal observations with the requirements of the Contract Documents.

1.2.4 Subject to Article 12, the Contract Documents, including the specifications and plans and drawings, are complementary and what is called for by any one shall be as binding as if called for by all. In case of conflict, large scale (detail) drawings shall govern over small-scale drawings, the specifications shall govern over both the construction administrative procedures manual and the Contract Drawings except as noted below, special provisions shall govern over both the Contract drawings and the general conditions, and subsequent addenda, interpretations, or change orders shall govern over the original documents, unless a different order of precedence is noted elsewhere in conjunction with a specific portion of the documents.

1.2.5 Subject to Article 15.10.1, in cases of discrepancy concerning dimension, quantity and location, the Specifications shall take precedence over the Drawings. Explanatory notes on the Drawings shall take precedence over conflicting drawn indications. Large Scale details shall take precedence over smaller scale details and figured dimensions shall take precedence over scaled measurement. Where figures are not shown, scale measurements shall be followed but shall in all cases be verified by measuring actual conditions of Work already in place. In cases of discrepancy concerning quality and application of materials and non-technical requirements over materials, the specifications shall take precedence over Drawings. In the case of discrepancy between the General Conditions and the General Requirements, the General Requirements shall take precedence.

1.2.6 Where on any Drawing a portion of the Work is drawn out and the remainder is indicated in outline, the drawn-out parts shall apply to all other like portions of the Work. Where ornament or other detail is indicated as starting, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to other similar parts in the Work, unless otherwise indicated.
1.2.7 Scale drawings, full-size details, and specifications are intended to be fully coordinated and to agree. Where not specifically stated otherwise, all work and materials necessary for each unit of construction, even though only briefly mentioned or indicated, shall be furnished and installed fully and completely, including, but not limited to, the manufacturer's instructions and/or recommendations, as part of this Contract.

1.2.8 Any material specified by reference to the number, symbol, or title of a specified standard such as a Commercial Standard, a Federal Specification, a trade association standard, or other similar standards, shall comply with the requirements in the latest approved revision thereof and any amendments or supplements thereto in effect on the date of Notice to Bidders, except as limited to type, class, or grade, or modified in such reference. The standards referred to, except as modified in the Specifications, shall have full force and effect as though printed in these Specifications.

1.2.9 Diagrammatic Drawings: Drawings showing the locations of equipment, wiring, piping, etc., unless dimensioned, are diagrammatic, and conditions will not always permit their installation in the exact location shown. In such event, the Contractor shall notify the Construction Manager and obtain an interpretation before proceeding with the work in question. Unless site conditions are significantly different than could have been reasonably anticipated, installation as specified in the interpretation shall be without any additional compensation to the Contractor.

1.2.10 Engineer's Instruction Bulletins and Drawings. In addition to the Drawings incorporated in the Contract Documents, the Engineer, through the Construction Manager, may furnish such supplemental drawings or instructions from time to time as may be necessary to make clear or to define in greater detail the intent of the Contract Drawings and Specifications. In furnishing additional drawings or instructions, the Engineer shall have the authority to make minor changes in the Work, not involving any extra cost, and not inconsistent with the overall design of the Project. If extra cost is known to be involved, these instructions will be accompanied by a PCO/RFP. These supplemental drawings and instructions shall be signed and returned by the Contractor within five (5) days and shall become a part of the Contract Documents; the Contractor shall make its work conform to them.

1.2.11 If the Contractor observes any errors, discrepancies or omissions in the Contract Documents, he or she shall promptly notify the Construction Manager requesting clarification. If the Contractor proceeds with work affected by such errors, discrepancies or omissions, without having received such clarification, he or she does so at its own risk. Any adjustments involving such circumstances made by the Contractor, prior to approval by the Construction Manager, shall be at the Contractor's sole expense and Contractor shall indemnify, hold harmless and defend County, and Construction Manager from any liability or loss with respect to said adjustments.

1.2.12 When the Contractor does not agree that work due to an interpretation or supplemental drawing or instruction is within the scope of the Contract Documents, the Contractor shall nevertheless perform such work without delay as directed in writing by the Construction Manager. Within seven (7) days after receipt of the interpretation or instruction, the Contractor shall submit a change order request to the Construction Manager specifying in detail in what particulars the Contract requirements were exceeded and the change in cost resulting therefrom. The Construction Manager shall then determine whether a Change Order shall be issued in accordance with Article 12.
of these General Conditions.

1.2.13 The time during which the protest is pending shall not affect the Contract Time. Contract time extensions shall be based solely on extra time required for work performed.

1.2.14 All work and material shall be the best of the respective kinds specified or indicated. Should any workmanship or materials be required, which are not directly or indirectly called for in the Specifications and/or shown on the Drawings, but which are necessary for proper fulfillment of the obvious intent thereof, said workmanship or materials shall be the same for similar parts that are detailed, indicated or specified, and the Contractor shall understand the same to be implied and provide for it in its tender as if it were particularly described or delineated.

1.3 OWNERSHIP AND USE OF DOCUMENTS

1.3.1 All Drawings, Specifications and copies thereof furnished are and shall remain the property of the County. With the exception of one Contract set for each party to the Contract, such documents are to be returned by Contractor or suitably accounted for to the County on request at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Engineer's common law copyright or other reserved rights. The County's use of the documents will not increase the Engineer's design liability beyond the Project and the site for which the design was originally intended.

ARTICLE 2

ADMINISTRATION OF THE CONTRACT

2.1 THE PROJECT ENGINEER

2.1.1 The Project ENGINEER is the person lawfully licensed to practice engineering, or an entity lawfully practicing engineering, identified as such in the County-Contractor Agreement. The term Project Engineer means the Engineer or the Engineer's authorized representative.

2.1.2 The Project Engineer is the Engineer or firm engaged as an independent Contractor by the County to design the Project, and all subconsultants or joint venturers of the Project Engineer. The authority of the Project Engineer to bind the County is limited to that authority specified in the Contract Documents, and no additional authority has been granted, nor shall be inferred.

2.1.3 The Project Engineer advises the Construction Manager in all aspects of the construction phase of the Project. His functions include advice and assistance to the Construction Manager in the correct interpretation and application of the Contract Documents. However, the Construction Manager is the County's representative on the Project, not the Project Engineer.

2.1.4 The Contractor shall deliver all correspondence relating to the proper execution of the Work to the Construction Manager, with a copy delivered to the Project Engineer. The Construction Manager reserves the right to consult with the Project Engineer prior to responding to the Contractor’s correspondence.
2.1.5 When discussions between the Contractor and the Construction Manager occur either on the site or elsewhere, but the Project Engineer is not present, the Construction Manager reserves the right to consult with the Project Engineer prior to issuing his/her final decision or instructions.

2.1.6 The Project Engineer will review or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and the information given in the Contract Documents. Such action shall be taken within ten (10) working days so as to cause no delay. The Project Engineer's review of a specific item shall not indicate approval of an assembly of which the item is a component.

2.2 THE CONSTRUCTION MANAGER

2.2.1 The “Construction Manager” is the County's designated representative in all aspects of administering the construction Contract on behalf of the County. All communications from the Contractor will be channeled through the Construction Manager. However, the Construction Manager does not have the authority to bind the County in matters affecting adjustments to the time or cost of project as defined in Agreement for Construction.

2.2.2 The Construction Manager will be the County's representative during construction and until final payment to all contractors is due. The Construction Manager will advise and consult with the County. All instructions to the Contractor shall be forwarded through the Construction Manager. The Construction Manager will have authority to act on behalf of the County only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with Subparagraph 2.2.17.

2.2.3 The Construction Manager will determine in general that the Work of the Contractor is being performed in accordance with the Contract Documents, and will endeavor to guard the County against defects and deficiencies in the Work of the Contractor.

2.2.4 The Construction Manager will be on-site for the duration of the construction process and will administer the Contractor's Contract and observe and report on the progress of the Work. The Construction Manager will review the progress and quality of the Work and determine in general if the Work is proceeding in accordance with the Contract Documents. On the basis of on-site observations and communication with the Contractor, the Construction Manager will keep the County informed of the progress of the Work, and will endeavor to guard the County against defects and deficiencies in the Work of the Contractor.

2.2.5 The Construction Manager shall at all times have access to the Work wherever it is, in preparation and progress. The Contractor shall provide facilities for such access so that the Construction Manager may perform its functions under the Contract Documents.

2.2.6 Based on the Construction Manager's observations, and an evaluation of the Contractor's Application for Payment, the Construction Manager will determine the amount owing to the Contractor and will issue to the County Certificates for Payment incorporating such amount, as provided in Paragraph 9.4.

2.2.7 The Construction Manager will be the initial interpreter of the requirements of the Contract Documents and the initial judge of the performance thereunder by the Contractor.
2.2.8 The Construction Manager will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with agreed upon time limits. Either party to the Contract may make written request to the Construction Manager for such interpretations.

2.2.9 Claims, disputes and other matters in question between the Contractor and the Construction Manager relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be referred to the Public Works Director of Tulare County or (his/her designee).

2.2.10 All interpretations and decisions of the Construction Manager shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in graphic form.

2.2.11 The County's decisions in matters relating to artistic effect will be final.

2.2.12 The Construction Manager will have the authority to reject or recommend to the County the rejection of work, materials, or workmanship which does not conform to the Contract Documents. Whenever, in the Construction Manager's opinion, it is considered necessary or advisable for the implementation of the intent of the Contract Documents, the Construction Manager will have authority to require special inspection or testing of the Work in accordance with Subparagraph 7.7.1 whether or not such Work be then fabricated, installed or completed.

2.2.13 The Construction Manager receives from the Contractor and reviews in conjunction with the Engineer all Shop Drawings, Product Data and Samples.

2.2.14 The Construction Manager will forward Contractor’s submittals such as Shop Drawings, Product Data and Samples, to the Engineer for review and approval or for other appropriate action. The Engineer’s action is only for conformance with the design concept of the Work and the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Engineer’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

2.2.15 Following consultation with the County, the Construction Manager will take appropriate action on Change Orders in accordance with Article 12, and will have authority to order minor changes in the Work as provided in Subparagraph 12.4.1.

2.2.16 The Construction Manager, in conjunction with the Engineer, will conduct inspections to determine the date of Substantial Completion and final completion, and will receive and forward to the County for the County's review written warranties and related documents required by the Contract and assembled by the Contractor. The Construction Manager will issue a final Project Certificate for Payment upon compliance with the requirements of Paragraph 9.8.

2.2.17 The duties, responsibilities and limitations of authority of the Construction Manager as the County’s representative during construction as set forth in the Contract Documents, will not be modified or extended without written consent of the County, and the Construction Manager, which consent shall not be unreasonably withheld. Failure of the Contractor to respond within ten days to a written request shall constitute consent by the Contractor.

2.2.18 In case of the termination of the employment of the Construction Manager, the County
shall appoint a Construction Manager, whose status under the Contract Documents shall be that of the former Construction Manager, respectively.

ARTICLE 3
COUNTY

3.1 DEFINITION

3.1.1 The County is the person or entity identified as such in the County-Contractor Agreement. The term County means the County of Tulare or the County’s authorized representative for this project. The County’s authorized representative for this project is the Tulare Public Works Director (or his/her designee).

3.2 INFORMATION AND SERVICES REQUIRED OF THE COUNTY

3.2.1 Except as provided in Subparagraph 4.7.1, the County shall secure and pay for necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

3.2.2 Information or services under the County’s control shall be furnished by the County with reasonable promptness to avoid delay in the orderly progress of the Work.

3.2.3 The Contractor will be furnished not more than four (4) copies of the Drawings and Project Manual, free of charge. Additional copies over this number may be obtained by the Contractor, at the cost of reproduction.

3.2.4 The County shall forward all instructions to the Contractor through the Construction Manager.

3.2.5 The foregoing are in addition to other duties and responsibilities of the County enumerated herein and especially those with respect to Work By County or By Separate Contractors, Payments and Completion, and Insurance in Articles 6, 9 and 11, respectively.

3.3 COUNTY’S RIGHT TO STOP THE WORK

3.3.1 If the Contractor fails to correct defective Work as required by Paragraph 13.2, or persistently fails to carry out the Work in accordance with the Contract Documents, the County, by a written order signed personally or by an agent specifically so empowered by the County in writing, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the County to stop the Work shall not give rise to any duty on the part of the County to exercise this right for the benefit of any Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3.

3.4 COUNTY’S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, and fails within three (3) days after receipt of written notice from the County to correct such default or neglect with diligence and promptness, the County may, after an additional written notice and without prejudice to any other remedy the County may have, make good such deficiencies, and may further elect to
complete that portion of the Work through such means as the County may select, including the use of a new contractor. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the additional services of the Construction Manager, Engineer or other Professionals made necessary by such default, neglect or failure. Such action by the County and the amount charged to the Contractor are both subject to review by the Construction Manager. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the County.

ARTICLE 4
CONTRACTOR

4.1 DEFINITION
4.1.1 The Contractor is the person or entity identified as such in the Agreement Between County and Contractor. The term Contractor means the Contractor or the Contractor's authorized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS
4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Construction Manager any error, inconsistency or omission that may be discovered. The Contractor shall not be liable to the County or the Construction Manager for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such error, inconsistencies or omissions and knowingly failed to report it to the Construction Manager. The Contractor shall perform no portion of the Work at any time unless authorized by the Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

4.2.2 Neither the County nor the Construction Manager nor Engineer assume any responsibility for an understanding or representation made by any of their agents or representatives prior to the execution of the Agreement unless (1) such understanding or representations are expressly stated in the Agreement, and (2) the Agreement expressly provides that responsibility therefore is assumed by the County.

4.2.3 Failure by the Contractor to acquaint him or herself with all available information will not relieve him or her from responsibility for estimating properly the difficulty or cost of successfully performing the Work.

4.2.4 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Construction Manager at once.

4.2.5 Before submitting any Request for Information (RFI), or other Contractor-initiated request for information the Contractor shall determine that the information requested is not clearly provided in the Contract Documents. RFI submittals shall be submitted to the Construction Manager only from the Contractor, or County, and not from any subcontractor, supplier or other vendor, and shall be on a form approved by the Construction Manager and County. The Contractor shall provide a revised and updated RFI Priority Schedule on not less than a weekly basis. The RFI Priority Schedule shall rank RFI's in order of priority and include a brief statement of reason for priority. County-initiated RFI's will not be listed on the Contractor's RFI Priority Schedule. The County will provide the Construction Manager a separate list of
County initiated RFI's upon request of the Construction Manager. The Construction Manager will endeavor to respect the order of priorities as requested by the Contractor or County for the overall benefit of the Project. The RFI process is for information and clarification only and may not be utilized to obtain approval for changes in the Work.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, procedures, or safety procedures at the project site; and procedures; and shall coordinate all portions of the Work under the Contract.

4.3.2 The Contractor shall be responsible to the County for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and any other persons performing any of the Work under a contract with the Contractor.

4.3.3 The Contractor shall not be relieved from the Contractor's obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Construction Manager in its administration of the Contract, or by inspections, tests or approvals required or performed under Article 7 by persons other than the Contractor.

4.3.4 The County, Construction Manager, and Engineer will deal only with the Contractor; and not through subcontractors. The Contractor shall be responsible for the proper execution of the Work. Any and all discussions between any subcontractor and supplier and the County, Construction Manager or the Engineer shall be initiated through the Contractor or its representative.

4.3.5 The Contractor is to provide training to its employees as needed to ensure that proper safety procedures are followed when working with asbestos containing materials. All applicable OSHA standards are to be followed and the Contractor is responsible for proper handling and disposal of asbestos containing materials as a result of its work.

4.4 LABOR AND MATERIALS

4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

4.4.2 The Contractor shall at all times enforce strict discipline and good order among the Contractor's employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned them.

4.4.3 The Contractor shall deliver to the Construction Manager, prior to final acceptance of the Work as a whole, signed certificates from suppliers of materials and manufactured items stating that such items conform to the Contract Documents.

4.4.4 The Contractor, immediately upon Notice to Proceed (or where shop drawings, samples, etc., are required, immediately upon receipt of approval thereof) shall place orders for all materials, work fabrication, and/or equipment to be employed by him or her in that portion of the Work contracted for. The Contractor shall keep all materials, work fabrications and/or equipment specified and shall advise the Construction Manager promptly, in writing, of all orders placed and of such materials, work fabrications and/or
equipment which may not be available in a timely manner for the purposes of the Contract.

4.4.5 Workers whose work is unsatisfactory to the County or the Construction Manager, or are considered by the County or Construction Manager to be careless, incompetent, unskilled or otherwise unfit shall be dismissed from work under the Contract upon written request to the Contractor from the County or the Construction Manager. Any costs associated with dismissal are the responsibility of the Contractor. Any termination of a subcontractor pursuant to this Section shall be in strict conformity with the requirements of the Subletting and Subcontracting Fair Practices Act, Part 1 of Division 2 of the Public Contract Code, commencing with Section 4100.

4.4.6 In the event that the Contractor furnishes a material, product, process, or article better than that specified in the Contract Documents, the difference in cost of that material, product, process, or article shall be borne by the Contractor.

4.4.7 Prior to the Notice to Proceed, Contractor shall submit a list of all subcontractors and material suppliers including company name, address, business and emergency telephone numbers, and contact person.

4.5 Warranty

4.5.1 The Contractor warrants to the County that all materials and equipment furnished under this Contract will be new unless otherwise specified and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. The Contractor warrants to the County that to the best of the Contractor’s knowledge, no installed materials or equipment contain asbestos. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Construction Manager, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 13.2.3. Contractor shall guarantee all work required under the Agreement against faulty materials or poor workmanship during the construction period and for 1 year after the date of completion and acceptance of the Work.

4.6 Taxes

4.6.1 The Contractor shall pay all sales, consumer, use and other similar taxes for the work or portions thereof provided by the Contractor which are legally enacted at the time bids are opened, whether or not yet effective.

4.7 Permits, Fees, and Notices

4.7.1 Unless otherwise provided in the Contract Documents, the County shall secure and pay for any building permit and permanent utility connection fees. The Contractor shall secure and pay for temporary construction utilities, and all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required at the time bids are opened.

4.7.2 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work.

4.7.3 If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, the Contractor shall promptly notify the County in writing, and any necessary changes shall be accomplished by appropriate modification.
4.7.4 If the Contractor performs any Work contrary to any laws, ordinances, rules and regulations, without notice to the Construction Manager, the Contractor shall assume full responsibility therefore and shall bear all costs attributable thereto.

4.7.5 Any reference in the Project Manual text to codes, standard specifications or manufacturer's instructions shall mean the latest printed edition of each in effect at the Contract date.

4.8 ALLOWANCES

4.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by these allowances shall be supplied for such amounts and by such persons as the Construction Manager may direct, but the Contractor will not be required to employ persons against whom the Contractor makes a reasonable objection.

4.8.2 Unless otherwise provided in the Contract Documents:

1. These allowances shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the allowance, delivered at the site, and all applicable taxes;

2. The Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance; and

3. Whenever the cost is more or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expenses.

4.9 SUPERINTENDENT

4.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The Contractor shall provide resumes for all of the Contractor's supervisory employees to be assigned to the Project for County review, and the County may reject any supervisory employees not deemed to be qualified at the sole discretion of the County. The superintendent shall represent the Contractor and all communications given to the superintendent shall be binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed upon written request in each case.

4.9.2 The Superintendent who begins the Project shall remain on the Project until the Project is completed, as long as that person is employed by the Contractor. The Superintendent shall not be replaced without the approval of the County.

4.9.3 If Contractor fails to provide a qualified full-time superintendent on the site on any given day when work is being performed, then Contractor shall pay to County, as liquidated damages and not as a penalty, the sum of $400.00 per day for each such day. County and Contractor agree that County's damages for such failure would be extremely difficult or impracticable to determine and that the aforesaid amounts are reasonable estimates of and reasonable sums for such damages. County may deduct any liquidated damages due from Contractor from any amounts otherwise due to Contractor under the Contract Documents. This provision shall not limit any right or remedy of County in the event of any other default of Contractor.
CONTRACTOR'S CONSTRUCTION SCHEDULE

4.10 Contract Schedule Development

Within 10 days after receiving the Notice to Proceed, the Contractor shall submit a detailed proposed Contract Schedule presenting an orderly and realistic plan for completion of the Work, in conformance with the requirements of this specification.

The Contract Schedule shall furnish or comply with the following requirements:

A. Format: a time scaled CPM schedule.

B. Overall time of completion and time of completion for each milestone shown on the Contract Schedule shall adhere to the times in the Project Manual, if applicable.

C. Calendar Schedule: Calendar days are the basis of the schedule.

D. No activity on the schedule shall have duration longer than seven (7) days, with the exception of fabrication and procurement activities, unless otherwise approved by the Construction Manager. Activity durations shall be the total number of actual days required to perform that activity including consideration of weather impact on completion of that activity.

E. Procurement of major equipment, through receipt and inspection at the job site, identified as a separate activity.

F. County furnished materials and equipment if any, identified as separate activities.

G. Dependencies (or relationships) between activities shown.

H. Processing/approval of submittals and shop drawings for major equipment shown. Activities that are dependent on submittal acceptance and/or material delivery shall not be scheduled to start earlier than the expected acceptance or delivery dates.

I. The total cost of performing each activity shown. This cost shall be the total of labor, material, equipment, including overhead and profit. The sum of the cost for activities shall equal the total Contract value.

J. The resources required (manpower and major equipment) to perform each activity shown.

K. Ten (10) days for developing punch list(s), completion of punch list items, and final cleanup for the Work or any designated portion thereof.

L. Interface with the work of other Contractors (or entities).

M. Separate buildings and other independent project elements shall be individually identified in the network.

N. Along with the schedule, Contractor shall provide a procurement log including the following information for each type of material or equipment to be provided:

O. Material or equipment description.

Q. Duration in days required for preparation and review of submittals.

R. Duration in days required for fabrication and delivery.

S. Cross references to activities, which will be affected by the delivery date of the material or equipment item.

T. Scheduled delivery dates.

The Contractor shall submit the reports and number of copies as required under Division One of this specification.

The Construction Manager will review the Proposed Contract Schedule for conformance with the requirements of the Contract. Within three (3) days after receipt, the Construction Manager will accept the Contract Schedule or will return it with comments. If the Proposed Contract Schedule is not accepted, Contractor shall revise the schedule to incorporate comments and resubmit the schedule for acceptance within three (3) days after receiving the comments.

The accepted Contract Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. The responsibility for developing the Contract Schedule and monitoring actual progress as compared to the schedule rests with the Contractor.

Failure of the Contract Schedule to include any element of the Work or any inaccuracy in the Contract Schedule will not relieve Contractor from responsibility for accomplishing all the Work in accordance with the Contract.

Acceptance of the Contract Schedule will not relieve the Contractor of the responsibility for accomplishing the Work in accordance with the Contract.

Monthly Updates
Contractor shall submit to the Construction Manager each month an up-to-date status report of the work. The status report shall include:

A. Contractor's estimated percentage complete for each activity not yet complete.

B. Actual start/finish dates for activities as appropriate.

C. Identification of processing errors, if any, on the previous update reports.

D. Revisions, if any, to the assumed activity durations including revisions for weather impact for any activities due to the effect of the previous update on the schedule.

E. Identification of activities that are affected by Proposed Change Orders issued during the update period.

F. Resolution of conflict between actual work progress and work schedule. When out-of-sequence activities develop in the Contract Schedule because of actual
construction progress, the Contractor shall submit revisions to the schedule to conform to current status and direction.

The Construction Manager will review the updated information and meet with the Contractor each month at the site to determine the status of the Work. If agreement cannot be reached on any issue, the Contractor will use the Construction Manager’s determination in the processing of the update.

Progress payments pursuant to the Contract will be based on the update of the Contract Schedule.

Short Interval Schedules.
Contractor shall prepare a Short Interval Schedule (SIS) to be used throughout the duration of Work. The SIS shall include all current activities and projected activities for the succeeding one (1) week. The SIS shall include actual start/finish dates for the preceding one (1) week. The SIS shall be submitted to the Construction Manager prior to the weekly construction meeting. The Contractor shall participate in short interval scheduling coordination during the weekly construction meetings.

Responsibility for Completion.
The Contractor shall furnish sufficient manpower, materials, facilities and equipment and shall work sufficient hours, including night shifts, overtime operations, Sundays and holidays as may be necessary to insure the prosecution and completion of the Work in accordance with the accepted Construction Schedule. If work on the critical path is seven days or more behind the currently updated Construction Schedule and it becomes apparent that the Work will not be completed within the Contract Time, the Contractor will implement whatever steps it deems necessary to make up all lost time. If the Contractor’s solution is not successful, it will make further attempts using the following sequence of events:

A. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.
B. If the above cannot be achieved then;

1. The Contractor shall increase manpower in such quantities and crafts as will substantially eliminate, in the judgment of the Construction Manager, the backlog of work; or increase the number of working hours, shifts per working day, working days per week or the amount of equipment or any combination of the foregoing sufficiently to substantially eliminate in the judgment of the Construction Manager the backlog of work.

2. In addition, the Construction Manager may require the Contractor to submit a recovery schedule demonstrating its program and proposed plan to make up a lag in scheduled progress and to ensure completion of the Work within the Contract Time. If the Construction Manager finds the proposed recovery schedule unacceptable, it may require the Contractor to submit a new plan. If the actions taken by the Contractor or the second plan proposed are unsatisfactory, the Construction Manager may require the Contractor to take any of the actions set forth in the previous paragraph without additional cost to the County to make up the lag in scheduled progress.

Failure of the Contractor to comply with the requirements of “Short Interval Schedules” shall be considered grounds for a determination by the County, pursuant to Article 14, that the Contractor is failing to prosecute the Work with such diligence as will ensure its
completion within the time specified.

**Daily Reports**

Contractor shall submit a Daily Activity Report to the Construction Manager for each workday including weekends and holidays, when worked.

Contractor may use its own report, provided it contains the same information included in the standard form furnished by the Construction Manager.

4.11 **RECORDS, DOCUMENTS AND SAMPLES AT THE SITE**

4.11.1 The Contractor shall maintain all records of required City, County or State inspections and shall promptly notify the Construction Manager of the results of any inspection. Copies of all such records shall be provided to the County upon request.

4.11.2 The Contractor shall secure and maintain required certificates of inspection, testing or approval and shall promptly deliver them to the Construction Manager.

4.11.3 The Contractor shall maintain a master set of drawings and specifications at the site which shall be regularly updated to reflect current as-built conditions of the Work. The Contractor shall update the drawings as work progresses. The information to be recorded by the Contractor will be determined by the Engineer, who will be responsible for preparing the final, reproducible as-built drawings based upon the information submitted by the Contractor. At a minimum, the following information shall be inserted and dimensioned on those drawings and specifications, in RED, by the Contractor: the exact horizontal and vertical location of all installations in their finished condition, including all electrical, plumbing and mechanical installations; all changes in construction, materials and installed equipment; adequate dimensional data, both horizontal and vertical, to allow location of covered installations and the identification of changes authorized by Change Order. The updated drawings and specifications shall be available for review by the Construction Manager and the Inspector.

4.12 **SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

4.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

4.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

4.12.3 Samples are physical examples, which illustrate materials, equipment or workmanship, and establish standards by which the work will be judged.

4.12.4 The Contractor, at its sole cost and expense, shall furnish to the Construction Manager all drawings and other descriptive material as are required by the specifications or requested by the Engineer. Shop drawings shall be done with sufficient detail to adequately describe items proposed to be furnished or methods of installation to enable the County and Engineer to determine compliance with the specifications and with the design and arrangement shown on the working drawings. The Construction Manager will not accept shop drawings or manufacturers’ instructions which are not sufficiently dimensioned and detailed to demonstrate compliance with the Contract Documents.
The Contractor shall check and coordinate all submittals with the work of all trades involved before they are submitted.

4.12.5 All submittals for the Project shall be made within fifteen (15) days of the Notice of Award; however, the Contractor shall have the additional responsibility to coordinate the schedule of its submittals with the requirements of the Construction Schedule so as not to delay the Project. No delay claims related to submittals will be entertained on the Project for any submittal originally received after the 15 day submittal period.

4.12.6 All submissions must be marked with the name of the Project and the name of the Contractor and shall be numbered consecutively and complete in every respect.

4.12.7 The drawings and instructions shall be submitted promptly, so as to cause no delay in the work. The drawings and instructions shall be submitted so as to allow the Construction Manager and the Engineer a review period of no less than five (5) days.

4.12.8 By preparing, approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that the Contractor has determined and verified all materials, field measurements and field construction criteria related thereto, or will do so with reasonable promptness, and has checked and coordinated the information contained within such submittals with the requirements of the Work, the Project and the Contract Documents. The Contractor shall adhere to any supplementary processing and scheduling instructions pertaining to shop drawings as may be issued by the Construction Manager.

4.12.9 The Contractor shall not be relieved from responsibility to fulfill the Contract at no extra cost to the County, within the Contract Time, by the Engineer's approval of Shop Drawings, Product Data or Samples. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Construction Manager's approval of Shop Drawings, Product Data or Samples under Subparagraph 2.2.14, unless the Contractor has specifically informed the Construction Manager in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Engineer's approval of them.

4.12.10 When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

4.12.11 The Contractor shall direct specific attention, in writing or on resubmitted Shop drawings, Product Data, or Samples, to revisions other than those requested by the Engineer on previous submittals. It shall be the responsibility of the Contractor to specifically point out any variation or discrepancy between the shop drawings or manufacturers' instructions submitted and the Contract Documents.

The Contractor shall make specific mention of all variations, along with an explanation of why they are requested, in its letter of transmittal.

FAILURE BY THE CONTRACTOR TO IDENTIFY IN ITS LETTER OF TRANSMITTAL ANY VARIATION, DISCREPANCY, OR CONFLICT WITH THE CONTRACT DOCUMENTS SHALL RENDER THE APPROVAL NULL AND VOID, AND THE CONTRACTOR SHALL BEAR ALL RISK OF LOSS AND RECONSTRUCTION COSTS OR DELAYS.
If any architectural, plumbing, mechanical, electrical, or structural modifications are required as a result of the approval of shop drawings or manufacturers’ instructions which deviate from or do not comply with the Contract Documents, those modifications shall be made without extra cost to the County, and without extension of the Contract Time. Any other resultant costs, including but not limited to design fees, Construction Management fees, cost incurred by other contractors, or inspection fees, shall be at the expense of the Contractor.

4.12.12 No portion of the work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Engineer as provided in Subparagraph 2.2.14. All such portions of the Work shall be in accordance with approved submittals.

4.12.13 Submission of Shop Drawings and Samples to the Construction Manager is required for only those items specifically mentioned in the Specification Sections. If Contractor submits Shop Drawings for items other than the above, the Construction Manager will not be obligated to distribute or review them. Contractor shall be responsible for the procuring of Shop Drawings for his or her own use as he or she may require for the progress of the Work.

4.12.14 The term “Shop Drawings” as used herein also includes, but is not limited to fabrication, erection, layout and setting drawings, manufacturer’s standard drawings, descriptive literature, catalogs, brochures, performance and test data, wiring and control diagrams, all other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and the positions and layout of each conform to the Contract requirements. As used herein the term “manufactured” applies to standard units usually mass-produced and “fabricated” means items specifically assembled or made out of selected materials to meet individual design requirements. Shop Drawings shall establish the actual detail of all manufactured or fabricated items; indicate proper relation to adjoining Work; amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure; and incorporate minor changes of design or construction to suit actual conditions.

Review of Shop Drawings.
Following submission, the shop drawings will be returned with one or more of five possible responses by the Construction Manager or Engineer. These possible responses are as follows:

A. Unreviewed: If the submittal is not required, or if it is not complete, or if it does not meet the form, format, and number requirements specified, it may be returned unreviewed. If the submittal is not required, work may commence; if the submittal was returned due to form requirements, it shall be resubmitted and approval obtained prior to commencement of the work.

B. Approved, Reviewed, or No exceptions taken: In the event the submittal is acceptable as submitted, it will be returned with this status. Work may proceed upon receipt of approved submittal.

C. Make Corrections Noted: If the submittal is acceptable except for certain items which have been noted by the Engineer, it will be so designated. Work may proceed with the corrections made, and no resubmittal is necessary.

D. Revise and Resubmit: This status indicates that revisions are noted on the submittal, and an
additional submittal is required to reflect those revisions and/or additional information. Work may not commence until the resubmittal is approved.

E. Rejected: A submittal may be rejected if it is not in compliance with the Contract Documents, or if it proposes an “or equal” or substitution which is not acceptable to the Engineer. A superseding submittal shall be submitted and approved prior to commencement of the work.

Should the Contractor proceed with the work shown on a submittal before approval is received, it shall remove and replace or adjust any work which is not in accordance with the shop drawings or manufacturers' instructions as ultimately approved, and it shall be responsible for any resultant damage, defect, or added cost. The County shall be under no obligation to pay for work installed prior to approval of shop drawings, until the shop drawings are approved and the work in place is found to be in compliance with the Contract Documents.

The Contractor shall resubmit submittals in categories “D” and “E” above after making any changes required so that submittals will comply with the Contract Documents. When resubmitting, the Contractor shall direct specific attention to deficient areas. Resubmittals shall be made in the same number of copies as the original submittal. Resubmittals shall be made within five (5) days of return of previous submittal, and in any event in sufficient time so as to avoid delay to the Work. No delay claims related to resubmittals will be entertained on the Project for any resubmittal originally received after the 5 days.

The Engineer shall determine the adequacy and completeness of all submittals. Where the Engineer deems a submittal to be inadequate, incomplete, or otherwise unsuitable for proper review, the Contractor shall submit all additional information requested by the Engineer. There shall be no change to the Contract Time or the Contract Sum when such additional information is required.

4.12.15 Drawings: Following Contractor's review and approval, Contractor shall submit to the Construction Manager, five (5) copies of each drawing for approval. The Construction Manager will check the submittal to see if it is complete. If complete, the Construction Manager will forward the drawings to the Engineer. The Engineer will check the drawings and affix a stamp to the prints, indicating the status of acceptance, and will return same to the Contractor, each retaining prints for its records. Comments, if any, will be noted directly on the prints. The Contractor shall then print and distribute the appropriate number of copies to its job personnel as required. If a print is stamped “Rejected”, the Contractor shall correct and resubmit as outlined above.

4.12.16 Samples: Following Contractor's review and approval, he or she shall submit to the Construction Manager, two samples of all materials in quantities and sizes as specified herein. Submittals shall be given to the Construction Manager at a time determined by the Contractor, which allows for any necessary resubmittal and which will not cause any delay in the work. Samples will be forwarded to the Engineer. If a sample is rejected, one sample noted so will be returned to the Contractor. If a sample is marked “Note Markings”, one sample so noted will be returned. Corrected samples shall be resubmitted for approval as per the original submittal.

4.12.17 Brochures: Following Contractor's review and approval, he or she shall submit to the Construction Manager, six (6) copies of all manufacturer's catalogs or brochures as required. If a brochure is stamped “No Exception Taken”, two (2) copies will be returned to the Contractor. If stamped “Rejected”, one marked copy and two (2) unmarked copies will be returned. Corrected copies shall be resubmitted for approval as per the
original submittal.

4.12.18 Manufacturer's Instructions: Where any item or work is required by Project Manual to be furnished, installed or performed in accordance with a specified product manufacturer's instructions, Contractor shall procure and distribute the necessary copies of such instructions to all concerned parties.

4.12.19 When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, and the Engineer has no information creating doubt as to the reliability of such certification, the Engineer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

4.13 USE OF SITE

4.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment. The Contractor shall be liable for any and all damage caused by it to County's premises. The Contractor shall hold and save the County, its agents, representatives, Engineer and Construction Manager, free and harmless and defend them from liability of any nature or kind arising from any use, trespass, or damage occasioned by its operations on premises or third persons.

4.13.2 The Contractor shall coordinate all of the Contractor's operations with, and secure approval from, the Construction Manager before using any portion of the site.

4.13.3 All workers, contractors, or contractors' representatives are admitted to the Site only for the proper execution of the Work, and have no tenancy.

4.13.4 The site will remain open to the public during construction of this project. Areas of the site may be closed where the Contractor is working at a given time. Permission to close an area of the site must be obtained from the Construction Manager in advance of the proposed closure. Contractor is responsible for all warning devices and barriers required to protect the health and welfare of the public at all times.

4.14 CUTTING AND PATCHING OF WORK

4.14.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly.

4.14.2 The Contractor shall not damage or endanger any portion of the Work or the work of the County or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the County or any separate contractor except with the written consent of the County and of such separate contractor. The Contractor shall not unreasonably withhold from the County or any separate contractor consent to cutting or otherwise altering the Work.

4.14.3 In all cases the Contractor shall exercise extreme care in cutting operations, and perform such operations under adequate supervision by competent mechanics skilled in the applicable trade. Openings shall be neatly cut and shall be kept as small as possible to avoid unnecessary damage. Careless and/or avoidable cutting damage, etc., will not be tolerated, and the Contractor will be held responsible for such avoidable or willful damage.

4.14.4 All replacing, patching and repairing of all materials and surfaces cut or damaged in the execution of the Work shall be performed by experienced mechanics of the several
trades involved. Such replacing, repairing or patching shall be done with the applicable materials, in such a manner that all surfaces so replaced, etc., will, upon completion of the Work, match the surrounding similar surfaces.

4.15 **CLEANING UP**

4.15.1 The Contractor shall at all times maintain its work area in an orderly manner. The Contractor shall keep the premises, including the Site, the Project, the adjacent sidewalks and street free from accumulation of waste materials or rubbish caused by the Contractor's operations on a daily basis or as directed by the Construction Manager. At the completion of the Work, the Contractor shall remove all of the Contractor's waste materials and rubbish from and about the Project as well as all the Contractor's tools, construction equipment, machinery and surplus materials.

The Contractor shall clean the portions of existing improvements and facilities which are used by, traversed or dirtied by the workers on the Work (normal maintenance due to use by the County's employees or the public excepted.)

The Contractor, at its sole cost, shall Contract with a disposal company to remove all rubbish, and shall have the refuse containers emptied at frequent enough intervals so that waste does not overflow the containers.

4.15.2 If the Contractor fails to clean up during progress or at the completion of the Work, the County may do so as provided in Paragraph 3.4 and the cost thereof shall be paid by the Contractor.

4.15.3 **Final Cleaning of Project**

Prior to final acceptance and occupancy by the County, the Contractor shall thoroughly clean the interior and exterior of the buildings, and the Site and adjacent areas, of all material related to its performance of the Work, including spots, stains, paint spots, trade markings and labels, and accumulated dust and dirt. The following list is not inclusive but to act as a guideline to include:

1. Removal of all paint spots, stains, rubbish, debris, tools and equipment from all areas and broom clean. Steam clean all carpets and mop floors.

2. Cleaning interior and exterior of the buildings including all windows in any area affected by the Work.

3. Brush off, broom sweep, dust and clean ledges, stairs, doors, hardware, chalk board trays and any adjoining rooms or areas that were affected by the work.

4. The Contractor shall clear grounds and exterior paved areas and walks of all construction debris, dirt and dust and shall repair any site areas damaged during the course of construction.

Prior to final completion or County occupancy, the Contractor shall conduct an inspection of sight-exposed surfaces, and all work areas, to verify that the entire Work is clean. In the event the Contractor fails to do so, the County may cause this work to be done at the Contractor's expense in accordance with Subparagraph 3.4.1.

4.16 **ROYALTIES AND PATENTS**

4.16.1 The Contractor shall pay all royalties and license fees, shall defend all suits or claims for
infringement of any patent rights and shall defend and save the County harmless from
loss on account thereof, except that the County shall be responsible for all such loss
when a particular design, process or the product of a particular manufacturer or
manufacturers is selected by the Engineer. If the Contractor has reason to believe that
the design, process or product selected is an infringement of a patent, the Contractor
shall be responsible for such loss unless such information is promptly given to the
County, Engineer and Construction Manager in writing.

4.17 INDEMNIFICATION AND DEFENSE

4.17.1 To the fullest extent permitted by law, Contractor must indemnify, defend (at
Contractor's sole cost and expense and with legal counsel approved by County, which
approval may not be unreasonably withheld), protect and hold harmless COUNTY, all
subsidiaries, divisions and affiliated agencies of County, and all of their representatives,
partners, designees, officers, directors, employees, consultants, agents, successors and
assigns, (each, an “Indemnified Party” and collectively, the “Indemnified Parties”), from
and against all claims (including, without limitation, claims for bodily injury, death or
damage to property), demands, obligations, damages, actions, causes of action, suits,
losses, judgments, fines, penalties, liabilities, costs and expenses (including, without
limitation, attorneys' fees, disbursements and court costs, and all other professional
expert or consultants' fees and costs and County general and administrative expenses)
every kind and nature whatsoever (individually, a “Claim”; collectively, “Claims”) which
may arise out of, pertain to, or relate (directly or indirectly) to the negligence,
recklessness, or misconduct of Contractor with respect to any work performed or
services provided under the Agreement (including, without limitation, the acts, errors
and/or omissions of Contractor, its principals, officers, agents, employees, vendors,
suppliers, consultants, sub-consultants, contractors, anyone employed directly or
indirectly by any of them or for whose acts they may be liable or any or all of them).
Contractor’s obligation to indemnify applies unless it is finally adjudicated that the
liability was caused by the sole active negligence or sole willful misconduct of an
Indemnified Party. If it is finally adjudicated that liability is caused by the comparative
active negligence or willful misconduct of an Indemnified Party, then Contractor's
indemnification obligation shall be reduced in proportion to the established
comparative liability.

4.17.2 The duty to defend under this section is wholly independent of and separate from the
duty to indemnify and the duty to defend exists regardless of any ultimate liability of
Contractor. The Contractor's defense obligation arises immediately upon presentation
of a Claim by any party and written notice of the Claim being provided to Contractor.
Payment to Contractor by any Indemnified Party or the payment or advance of
defense costs by any Indemnified Party cannot be a condition precedent to enforcing
the Indemnified Party's rights to indemnification under the Agreement. Contractor's
indemnification obligations under the Agreement will survive the expiration or earlier
termination of the Agreement until action against the Indemnified Parties for the matter
indemnified is fully and finally barred by the applicable statute of limitations or statute
do repose. Contractor's liability for indemnification under the Agreement is in addition to
any liability Contractor may have to County for a breach by Contractor of any of the
provisions of the Agreement. Under no circumstances may the insurance requirements
and limits set forth in the Agreement be construed to limit Contractor's indemnification
obligation or other liability under the Agreement. The terms of the Agreement are
contractual and the result of negotiation between the Parties.

4.17.3 In any and all claims against the County, the Construction Manager and Engineer or
any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph 5.17 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.17.4 The obligations of the Contractor under this Paragraph 4.17 shall not extend to the liability of the Engineer or Construction Manager, their agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Engineer, their agents or employees, provided such giving or failure to give directions is the primary cause of the injury or damage.

4.17.5 The indemnity obligation expressly extends to and includes any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of damages to adjacent property caused by the conduct of the Work.

4.17.6 The indemnity obligation expressly extends to and includes any and all claims, demands, damages, costs, expenses, or liability occasioned as a result of the violation by the Contractor, the Contractor's agents, employees, or independent contractors or subcontractors, of any provisions of federal, state or local law, including applicable administrative regulations.

The indemnity obligation also expressly extends to and includes any claims, demands, damages, costs, expenses, or liability occasioned by injury to or death of any person, or any property damage to property owned by any person while on or about the Site or as a result of the Work, whether such persons are on or about the Site by right or not, whenever the Work is alleged to have been a contributing cause in any degree whatsoever.

Nothing contained in the foregoing indemnity provisions shall be construed to require the Contractor to indemnify the County in contravention of Section 2782 of the Civil Code for the sole negligence or willful misconduct of the County.

Indemnification of Adjacent Property Owners: In the event the Contractor enters any agreement with the owners of any adjacent property to enter upon or adjacent to such property for the purpose of performing this Contract, the Contractor shall fully indemnify, defend and save harmless such person, firm, or corporation, state or other governmental agency which owns or has any interest in the adjacent property. The form and content of the indemnification agreement shall be approved by the County prior to commencement of any work on or about such property. The Contractor also shall indemnify the County as provided in Article 4. These provisions shall be in addition to any other requirements of the owners of adjacent property.

4.18 FAIR EMPLOYMENT PRACTICES CLAUSE

4.18.1 Nondiscrimination: In connection with the performance of Work under the Contract, the Contractor agrees (as prescribed in Chapter 6 of Division 3 of Title II of the Government Code of the State of California, Commencing at Section 12940 and by Labor Code Section 1735) not to discriminate against any employee or applicant for
employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status or sex. The aforesaid provisions shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post hereafter in conspicuous places, available for employees and applicants for employment, Notices to be provided by the County, setting forth the provisions of this discrimination clause. The Contractor further agrees to insert the foregoing provisions in all subcontracts hereunder, except subcontracts for standard commercial supplies of raw materials.

ARTICLE 5
SUBCONTRACTORS

5.1 DEFINITION
5.1.1 A Subcontractor is a person or entity who has a direct Contract with the Contractor to perform any of the Work at the site. The term Subcontractor means a Subcontractor or a Subcontractor's authorized representative. The term Subcontractor does not include any separate contractor or any separate contractor's subcontractors.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect Contract with a Subcontractor to perform any of the work at the site. The term Sub-subcontractor means a Sub-sub contractor or an authorized representative thereof.

5.2 AWARDS OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK
5.2.1 The Contractor shall only use subcontractors included in its sealed bid unless first approved by the County pursuant to statute. With respect to subcontractors ineligible to perform work on public works projects under Public Contract Code section 6109, the Contractor shall not use any such subcontractor, shall repay to the County any money paid to any such subcontractor, and shall pay the wages of the workers for any such subcontractor allowed to work on the Project.

5.3 SUBCONTRACTUAL RELATIONS
5.3.1 By an appropriate agreement, written where legally required for enforceability, the Contractor shall require each Subcontractor, to the extent of the work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assume toward the County, the Engineer and the Construction Manager. Said agreement shall preserve and protect the rights of the County, the Engineer and the Construction Manager under the Contract Documents with respect to the work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor Agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Documents, has against the County. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with their Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to their Sub-subcontractors. Nothing contained herein shall be deemed to create an agency relationship between the County and any Subcontractor or material supplier.
5.3.2 The substitution or addition of Subcontractors shall be permitted only as authorized by Public Contracts Code Section 4100, et. seq. The Subcontractors employed by the Contractor shall be appropriately licensed in conformity with the laws of the State of California. Should the Contractor violate any of the provisions of this Section, the violation shall be deemed a breach of this Contract and the County shall have all remedies provided by California law, including but not limited to those provided in Public Contract Code Section 4100, allowing termination of the Contract or a penalty assessment of ten percent (10%) of the subcontract amount.

5.3.3 Nothing contained in this Contract shall create any contractual relationship between any Subcontractor and the County nor create any contractual relationship between any Subcontractor and the Construction Manager or the Engineer.

5.3.4 Jurisdictional disputes between Subcontractors or between Contractor and Subcontractor shall not be mediated or decided by the County, Engineer or the Construction Manager. The Contractor shall be responsible for the resolution of all such disputes based upon its contractual relationship with its Subcontractors. If, through acts or neglect on the part of the Contractor, including failure to supervise and control its subcontractors or suppliers, any other contractor, subcontractor or supplier, or worker suffers loss or damage, the Contractor agrees to settle with such other contractor, subcontractor, supplier, or worker by agreement or arbitration, if such other contractor, subcontractor, or worker shall assert any claim against the County or any of its officers, agents, or employees, or account of any damage alleged to have been so sustained.

In the event of the receipt of any such claim, the County shall notify the Contractor, who shall defend, indemnify, and save harmless the County and all of its officers, agents, and employees against any such claim.

6.1 COUNTY'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The County reserves the right to perform work related to the Project with the County's own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. If the Contractor claims that delay, damage or additional cost is involved because of such action by the County, the Contractor shall make such claim as provided elsewhere in the Contract Documents.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate County-Contractor Agreement.

6.1.3 The County shall provide for coordination of the activities of the County's own forces and of each separate contractor with the work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the County in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the
6.1.4 Unless otherwise provided in the Contract Documents, when the County performs construction or operations related to the Project with the County's own forces, the County shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract including, without excluding others, those stated in Article 4, this Article 6 and Articles 10, and 13.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the County and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

6.2.2 When any part of the Contractor's Work depends for proper execution or results upon the work of the County or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Construction Manager any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acceptance of the County's or separate contractor's work as fit and proper to receive the Work, except as to defects which may subsequently become apparent in such work by others.

6.2.3 If, following the reporting of any discrepancy or defect as required in Subparagraph 6.2.2 above, the Contractor suffers damage due to disruption or delay caused by the separate contractor, without fault by the County, the Contractor's remedy shall be limited to seeking recovery from the separate contractor.

6.2.4 Any costs caused by defective or ill-timed work shall be borne by the Contractor or Subcontractor responsible therefore.

6.2.5 Should the Contractor cause damage to the work or property of the County, or to other work or property on the site, the Contractor shall promptly remedy such damage as provided in Subparagraph 10.2.5.

6.2.6 Should the Contractor wrongfully delay or cause damage to the work or property of any separate contractor, the Contractor shall, upon due notice, promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues the County on account of any delay or damage alleged to have been caused by the Contractor, the County shall notify the Contractor who shall defend such proceedings, and if any judgment or award against the County arises therefrom, the Contractor shall pay or satisfy it and shall reimburse the County for all costs which the County has incurred.

6.3 COUNTY'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.15, the County may clean up and the Contractor therefore shall pay the County such portions of the cost thereof as the Construction Manager shall determine to be just.
MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 The Contract shall be governed by the law of the State of California.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The County and the Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party with respect to all covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other.

7.3 WRITTEN NOTICE

7.3.1 Except as may be otherwise required by law, any notice to be given shall be written and shall be either personally delivered, sent by facsimile transmission or sent by first class mail, postage prepaid and addressed as follows:

COUNTY:

Resource Management Agency
5961 S. Mooney Blvd.
Visalia, CA 93277
Phone: (559) 624-7000
Fax: (559) 730-2653

PROJECT ENGINEER:

Matthew Kemp
Provost & Pritchard Consulting Group
286 W. Cromwell Avenue
Fresno, CA 93711-6162
Phone: (559) 449-2700
Fax: (559) 449-2715

CONTRACTOR:

[COMPANY NAME]
[COMPANY ADDRESS]
[CITY, STATE, ZIP CODE]
Phone: ______________
Fax: ______________

Notice personally delivered is effective when delivered. Notice sent by first class mail shall be deemed received on the fifth day after the date of mailing. Notices sent by facsimile shall be effective upon successful transmission. Either party may change the above address by giving written notice pursuant to this paragraph.

7.4 CLAIM REQUIREMENTS
7.4.1 A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time, arising out of or relating to the Contract or a request for equitable adjustment or Change Order which cannot be resolved per provisions of Article 13. Any Claim shall be reduced to writing and filed with the Tulare Public Works Director (or his/her designee), within twenty (20) calendar days after the Contractor has notice of the condition giving rise to the Claim, and final action per Article 12 procedures has taken place or has been declared as such in writing, by either party. Such twenty (20) day notice of an asserted claim is in addition to the requirement for prompt notice required per Paragraph 12.3.

7.4.2 Except as provided by Public Contract Code Section 7102, the Contractor shall not claim or recover any overhead cost, administrative or otherwise, particularly 'Home Office' expenses, 'Extended site overhead', or any other overhead cost on the basis of any 'Home Office' damages formula, 'Eichleay' formula, 'Total Cost' recovery formula or any other such formula.

7.4.3 Except as provided by Public Contract Code Section 7102, the Contractor shall have no claim for damages or compensation for any delay or hindrance. Contractor shall make any claims in writing within the time set forth above, for any unreasonable delay or hindrance caused by County, and specifying the cause thereof as required in 7.4.4 below.

7.4.4 REQUIREMENTS FOR FILING A CLAIM. Claims must be filed within the time specified in 7.4.1 above, but in no event later than the date of final payment. Claims shall be submitted to the Tulare Public Works Director (or his/her designee). The claim shall be in writing and shall be sum certain if known. If unknown, Contractor shall specify the basis for establishing the sum certain. Claim shall include a statement of the reasons for the asserted entitlement, and include the documents necessary to substantiate the claim. Such documents may include but are not limited to payroll records, purchase orders, quotations, invoices, estimates, subcontracts, daily logs, supplier contracts, subcontract billings, bid takeoffs, equipment rental invoices, ledgers, journals, daily reports, job diaries, and any documentation related to the requirements of Article 12. In the case of a continuing delay, only one claim is necessary. If adverse weather conditions are the basis for a claim for additional time, such claim shall be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the critical activities on the construction schedule. The Contractor shall certify, at the time of submission of a claim, as follows:

"I certify under penalty of perjury under the laws of the State of California, that the foregoing claim is made in good faith, that the supporting data are accurate, and in my opinion, justify the Contract adjustments requested.

By: ______________________________
(Contractor's signature)

Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by Contract for the filing of claims.

7.4.5 For any claim subject to this Article 7.4.5, the following requirements apply:

.1 The Tulare County Resource Management Agency’s Assistant Director for Public Works shall review the facts pertinent to the claim, obtain additional information deemed
necessary for a decision (if any), review recommendations of the County’s Representative, coordinate with the Contract administrator (if any) and secure assistance from legal and other advisors, and render a written decision on the claim within 45 days of receipt of the claim. The written decision shall identify what portion of the claim is disputed and what is undisputed. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the Assistant Director for Public Works and claimant. The Assistant Director for Public Works’ written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

2 Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the County issues its written statement. If the County fails to issue a written statement, subparagraph .6 shall apply.

3 If the claimant disputes the written response of the Assistant Director or the Assistant Director fails to respond within the time prescribed, the claimant may so notify the Assistant Director, in writing, either within 15 days of receipt of the Assistant Director’s response or within 15 days of the Assistant Director’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 receipt of such a written demand sent by registered mail or certified mail, return receipt requested, the Assistant Director (or his/her designee) shall schedule a meet and confer conference within 30 days for settlement of the dispute.

4 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 County shall provide the claimant 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 County 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 County and the claimant sharing the associated costs equally. The County and claimant shall mutually agree to a mediator within 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.

5 If following the meet and confer conference the claim or any portion remains in dispute, the claimant may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time the claim is denied, including any period of time utilized by the meet and confer conference. Unless otherwise agreed to by the County and the Contractor in writing, the mediation conducted pursuant to this Article shall excuse any further obligation under Public Contract Code Section 20104.4 to mediate after litigation has been commenced.
.6 Failure by the County to respond to a claim from the Contractor within the time periods described in this Article or to otherwise meet the time requirements of this Article shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the County’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 claimant.

.7 Amounts not paid in a timely manner as required by this Article shall bear interest at 7 percent per annum.

.8 If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against the County because privity of contract does not exist, the Contractor may present to the County 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 that 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 County 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 County and, if the original Contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

7.4.6 CLAIMS AND DISPUTES EXEMPT FROM FILING REQUIREMENTS. The procedures and remedies provided in this Article 8.4 do not apply to:

.1 Any claims by the County;
.2 Any claim for or respecting personal injury or death or reimbursement or other compensation arising out of or resulting from liability for personal injury or death;
.3 Any claim or dispute relating to stop payment requests or stop notices; and
.4 Any claim related to the approval, refusal to approve, or substitution of subcontractors, regardless of tier, and suppliers.

7.4.7 PAYMENT OF UNDISPUTED PORTION OF CLAIM. County shall pay claimant such portion of a claim which is undisputed except as otherwise provided in the Contract.

7.4.8 CONTINUE WORK DURING DISPUTE. In the event of any dispute between the County and the Contractor, the Contractor will not stop work but will execute the work diligently to completion in the manner directed by the County, and the dispute shall be resolved by a court of law after completion of the Work. However, all disputes must be submitted by Contractor in accordance with the provisions of Article 7.4.

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.5.1 The Contractor shall furnish Performance Bond in the amount of 100% of the Contract amount and Payment Bond in the amount of 100% of the Contract amount. The Bonds shall be the forms shown in Sections 00502 and 00503 respectively.

7.5.2 All bonds required, whether Bid bonds, Performance, Payment, or other bonds, shall be on the forms provided in Sections 00501, 00502 and 00503 above. The Bid Bond, Performance Bond, and Payment Bond must be issued by the same California admitted surety insurer. The payment and performance bonds required by these specifications will neither be accepted nor approved by the County unless the bonds are
underwritten by an admitted surety and the requirements of California Code of Civil Procedure section 995.630(a) and (b) are met and the bonds are accompanied by the County Clerk’s certificate as provided for in California Code of Civil Procedure Section 995.640(b). The County further reserves the right to satisfy itself as to the acceptability of the surety and the form of bond. Upon request of Tulare County, the bidder must submit the following documents:

1. The original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws, or other instrument authorizing the person who executed the bond to do so.

2. A certified copy of the certificate of authority of the insurer issued by the California Insurance Commissioner.

3. A certificate from the county clerk that the certificate of authority has not been surrendered, revoked, canceled, annulled, or suspended, or in the event that it has, that renewed authority has been granted.

4. A financial statement of the assets and liabilities of the insurer to the end of the quarter calendar year prior to 30 days next preceding the date of the execution of the bond, in the form of an officers’ certificate as defined in Corporations Code § 173. If the surety insurer is not found to be an “admitted surety insurer” the bid shall be determined non-responsive and shall be rejected. If the surety insurer’s assets do not exceed its liabilities in an amount equal to or in excess of the amount of the bond, subject to Section 12090 of the Insurance Code; or if the bidder fails to provide the specified documents; the bid may be determined non-responsive and may be rejected.

7.5.3 All costs for applicable bid bonds, payment bonds and performance bonds shall be included in the bid.

7.6 RIGHTS AND REMEDIES

7.6.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

7.6.2 No action or failure to act by the County, the Construction Manager, the Engineer or the Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

7.7 TESTS AND INSPECTIONS

7.7.1 Materials Which May be Tested.
The County reserves the right to require the Contractor to provide samples, and to perform tests on any materials, articles, equipment, installations, or construction performed by the Contractor in addition to those specified in the Contract Documents. The County shall assume the cost of sampling and testing materials only when the Contract Documents do not require the Contractor to do so.

7.7.2 Testing.
All tests shall be performed under the supervision of the testing laboratory or engineer
employed by the County and at such times as are convenient to the County. The Contractor shall provide written notice to the Construction Manager prior to the need for off-site tests or inspections, and the Construction Manager will arrange such tests or inspections.

7.7.3 Selection of Samples
All samples and specimens for testing shall be selected by the Inspector or by the testing laboratory, but not by the Contractor.

7.7.4 Delivery of Samples
The Contractor shall, at its sole cost and expense, furnish, package, mark, and deliver all samples to be tested at locations other than the Site. Samples shall be delivered either to the Inspector or to the testing laboratory or such other address specified by the Construction Manager.

Delivery of all samples to the testing laboratory shall be made in ample time to allow the test to be made without delaying construction. No extra time will be allowed for the completion of the Work by reason of delay in testing samples required by the Contract Documents or due to the Contractor’s request for substitution.

The Contractor shall allow free access at all times to the representatives of the testing laboratory to the Work, and shall point out the sources from which samples are taken.

All test reports shall be sent to all parties specified by the Construction Manager.

7.7.5 Approval of Samples
No materials or work of which samples and/or tests are required shall be used or covered until the Construction Manager informs the Contractor that such samples and/or tests have been approved. If the Contractor installs, uses, or covers any such material, article, or work prior to testing and approval, such shall be at the Contractor’s sole risk and expense, and it shall bear all costs of uncovering, repair, and replacement thereof. The approval of any samples shall be for the characteristics thereof, or for the uses named in such approval, and no other. No approval of any samples shall be deemed a change or modification in any requirement of the Contract Documents. Upon testing of any sample of material or work, no additional sample shall be considered. All material or work installed after the sampling and testing is performed and approved shall be equal to or better than the approved sample in all respects.

7.7.6 Damage Due to Testing
The Contractor shall, at its sole cost and expense, repair all damage resulting from testing specified in the Contract Documents. The County shall issue a Change Order for repair of damage due to sampling or testing other than specified in the Contract Documents.

The Contractor shall not make any tests upon portions of the Project already completed, except with the prior written consent and under the direction and supervision of the Construction Manager.

7.7.7 Retesting
If as a result of any test, whether originally specified or not, any material or work is found to be unacceptable, it shall be rejected, and all further sampling and testing required by the County or Construction Manager shall be at the Contractor’s expense.
7.7.8 **Effect of Sampling and Testing.**

The County assumes no obligation, and the Contractor shall be relieved of no obligation undertaken pursuant to the Contract Documents by virtue of sampling and testing specified in this article.

The responsibility for incorporating satisfactory materials and workmanship which meet the Contract Documents in the work rest entirely with the Contractor, notwithstanding any prior samples or tests.

7.7.9 **Inspection shall be provided as required under CCR Title 24, current edition.**

All inspection costs will be paid for by the County, including special inspection required by Title 24, except as noted otherwise below. A list of required inspections for the Project is included in the Contract Documents.

The Inspector shall be approved by the County. The Inspector will be employed by the County and will perform all inspections in accordance with Title 24, parts 1-5.

The designated Inspector shall be considered to be a representative of the County. It is the inspector’s duty to inspect those portions of the Work which the County has designated.

The Inspector shall have the authority to order the work designated for inspection stopped if a determination is made that work is proceeding in violation of the Contract Documents or any orders issued by the County, Construction Manager, or Engineer.

Upon issuing a stop work notice, the Inspector shall notify the Engineer, who shall

inspect the work in question and determine whether it does or does not comply with the Contract Documents. The decision of the Engineer shall be final. The Contractor shall thereafter comply with the instructions of the Engineer regarding corrections needed to cure the defect. The suspended work shall be resumed only when the instructions are fulfilled. The Contractor shall not be entitled to an extension of time in the event of such suspension of work.

Neither the final inspection and payment, nor any interim inspection or progress payment shall relieve the Contractor of its obligation to fulfill the Contract as required by the Contract Documents.

Any work, materials or equipment not meeting the requirements and intent of the Contract Documents may be rejected, and unsuitable work or materials shall be made good, notwithstanding the fact that such work or materials may previously have been inspected and/or payment therefore may have been made.

Should the Construction Manager or the Engineer determine that it is necessary or advisable to make an inspection of work already completed at any time before final inspection and acceptance of the Work, by removing or exposing any work, the Contractor shall, upon instruction of the Construction Manager, promptly furnish all necessary facilities, labor, and materials to do so. If the work is found to be defective in any respect due to the fault of the Contractor or any subcontractor, the Contractor shall bear all expenses of such examination and satisfactory reconstruction. If, however, the work is found to meet the requirements of the Contract Documents, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor and a change order shall be issued for such cost and any time extension justified by delays to the critical path.
Where the Contract Documents, instructions by the Inspector, Construction Manager or the Engineer, laws, ordinances, or any public authority having jurisdiction require work to be inspected, tested or approved before the Work proceeds, such work shall not proceed, nor shall it be covered up without inspection. If any part of the Work is covered prior to inspection, the County may order the work to be uncovered so that inspection may be accomplished. The Contractor shall bear all expenses of such examination and satisfactory reconstruction.

The Contractor shall provide written notice to the Inspector at least twenty-four (24) hours in advance of the readiness for inspection.

All work shall be available for inspection and the Inspector shall have full access to review all work during all working times. The Contractor shall provide all necessary means of access (e.g., ladders) for the Inspector to perform his or her duties. The Contractor shall furnish the Inspector with any information necessary to fully inform him or her of conditions. Inspection does not relieve the Contractor from fulfilling the requirements of the Contract Documents.

**ARTICLE 8**

**TIME**

8.1. **DEFINITIONS**

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial Completion of the Work as defined in Subparagraph 8.1.3, including authorized adjustments thereto. “Date of Completion” is the date certified by the Construction Manager when construction of the Work is 100% complete including acceptance by the Engineer on all punch list corrections.

8.1.2 The Date of Commencement of the Work is the date established in a Notice to Proceed. If there is no Notice to Proceed, it shall be such other date as may be established in the County-Contractor Agreement and receipt of all required preconstruction submittals, bonds and insurance, or as established elsewhere in the Contract Documents.

8.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Construction Manager when construction is sufficiently complete, in accordance with the Contract Documents, so that the County or separate contractors can occupy or utilize the Work or a designated portion thereof for the use for which it is intended.

8.1.4 The Date of Substantial Completion of the Project.

8.1.5 The term Day as used in the Contract Documents shall mean calendar day of 24 hours, including each and every day of the year unless specifically designated otherwise.

8.1.6 Abnormal Weather Conditions as used in the Contract Documents shall be defined as weather conditions that the area does not encounter more than once, on an average of every ten or fifteen years.

8.1.7 Normal Weather Conditions are weather conditions which are normal for the location.
of the Project, according to the U. S. Weather Bureau Records. The Contractor shall reasonably anticipate that normal weather conditions will be encountered, which based on the weather data from the Western Regional Climate Center, National Weather Service, for Visalia, California, average precipitation days per month are as follows:

- January: 5 days
- February: 5 days
- March: 4 days
- April: 2 days
- May: 1 day
- June: 0 days
- July: 0 days
- August: 0 days
- September: 0 days
- October: 1 day
- November: 3 days
- December: 4 days
- **Total:** 25 days/year

Final determination of the final impact of adverse weather may be deferred to the conclusion of the Work. Extensions of time may be requested for any month of construction for days lost, which affect the critical path of construction, due to adverse weather in excess of the normal weather conditions, as defined above. If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating days claimed and the impact on the critical path of construction.

The Contractor will not be granted time extensions for weather conditions which are normal for the Project location.

### 8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract.

8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Subparagraph 8.1.2.

8.2.3 The Contractor shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion of the Work within the Contract Time.

### 8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 Extensions of Time; Unavoidable Delays.

The Contractor shall not be granted an extension of time except on the issuance of a Change Order by the County, upon a finding of good cause for such extension.

A. As used herein, the following terms shall have the following meanings:
.1 “Excusable Delay” means any delay in completion of the Work beyond the expiration of the Contract Time caused by conditions beyond the control and without the fault or negligence of the Contractor. These events may include strikes, embargoes, fire, unavoidable casualties, national emergency, and stormy and inclement weather conditions in which the Construction Manager and Inspector agree that work on the critical path cannot continue. The financial inability of the Contractor or any Subcontractor or supplier and any default of any Subcontractor, without limitation, shall not be deemed conditions beyond the Contractor’s control. An Excusable Delay may entitle the Contractor to an extension of the Contract Time, in accordance with this Section of the general conditions, but shall not entitle the Contractor to any adjustment of the Contract Sum.

.2 “Compensable Delay” means any delay in the completion of the Work beyond the expiration date of the Contract Time caused solely by the wrongful acts of the County and which delay is unreasonable under the circumstances and not within the contemplation of the parties. A Compensable Delay may entitle the Contractor to an extension of the Contract Time, in accordance with this Section of the General Conditions and/or an adjustment of the Contract Sum, in accordance with Article 12. Except as provided herein, the Contractor shall have no claim for damage or compensation for any delay, interruption, hindrance, or disruption.

.3 “Inexcusable Delay” means any delay in completion of the Work beyond the expiration of the Contract Time resulting from causes other than those listed in Subparagraphs A1 and A2, above. An Inexcusable Delay will not entitle the Contractor to an extension of the Contract Time or an adjustment of the Contract Sum.

B. The Contractor may make a claim for an extension of the Contract Time, for an Excusable Delay or a Compensable Delay, subject to the following:

.1 If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay which ends last. Any adjustment of the Contract Sum shall be in accordance with Article 13 and shall be based only on the non-concurrent portion of any Compensable Delay.

.2 If an Inexcusable Delay occurs concurrently with either an Excusable Delay and/or a Compensable Delay, the maximum extension of the Contract Time shall be the number of days, if any, by which the duration of the Excusable Delay and/or the Compensable Delay calculated in accordance with Subparagraph B.1, if applicable, exceeds the Inexcusable Delay. The duration of the concurrence is non-compensable.

.3 Delays in the prosecution of parts or classes of the Work which do not prevent or delay the completion of the whole Work within the Contract Time are not to be considered Excusable or Compensable.

8.3.2 Notice of Delays.
Whenever the Contractor foresees any delay in the prosecution of the Work, and in any event immediately upon the occurrence of any delay which the Contractor regards as good cause for an extension, the Contractor shall notify the Construction Manager in writing of the delay. The notice shall specify with detail the cause asserted by the Contractor to constitute good cause for an extension together with a description of the effect of the delay on the Construction Schedule and a quantification of the length of the requested extension of time. Failure of the Contractor to submit such a notice within
seven (7) days after the initial occurrence of the event giving rise to the delay shall constitute a waiver by the Contractor of any request for extension, and no extension shall be granted as a consequence of such delay. Any claim or extension of time shall be made in writing to the Construction Manager not more than ten (10) days after the commencement of the delay; otherwise it shall be waived. In the case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work.

The County shall have no obligation to consider any time extension request unless the requirements of the Contract Documents are complied with. The County shall not be responsible or liable to the Contractor for any constructive acceleration due to failure of the County to grant time extensions under the Contract Documents, should the Contractor fail to comply with the submission and justification requirements of the Contract Documents for time extension requests. The Contractor’s failure to perform in accordance with the Construction Schedule shall not be excused because the Contractor has submitted time extension requests, unless and until such requests are approved by the County.

8.3.3 Investigation; Procedure.
Upon receipt of a request for extension, the Construction Manager shall conduct an investigation of the facts asserted by the Contractor to constitute good cause for an extension. The Construction Manager shall report the results of this investigation, as well as the propriety of the time extension requested, to the Contractor in writing within 10 days of receipt of the request and shall indicate whether it will recommend for or against the extension.

Upon receiving the Construction Manager’s recommendation, the Contractor may either concur in the recommendation, or reject the recommendation and proceed with a claim as provided for in Article 7.4.

8.3.4 Discretionary Time Extensions for Best Interest of County.
The County reserves the right to extend the time for completion of the Work if the County determines that such extension is in the best interest of the County. In the event that a discretionary extension is granted at the request of the Contractor, the County shall have the right to charge to the Contractor all or any part, as the County may deem proper, of the actual cost of construction management, Consulting, inspection, supervision, incidental and other overhead expenses that accrue during the period of the extension, and to deduct all or any portion of that amount from the final payment for the Work.

In the event a discretionary time extension is ordered over the objection of the Contractor, and the decision rests solely with the County and is not legally compelled for any cause, the Contractor shall be entitled to a Change Order adjusting the price paid to reflect the actual costs incurred by the Contractor as a direct result of the delay, upon its written application therefore, accompanied with such verification of costs as the Construction Manager requires. The decision of the County on any discretionary time extension and the costs thereof shall be final and binding on the County and the Contractor.

8.3.5 Liquidated Damages
If the Work is not completed by the Contractor in the time specified in, or within any period of extension authorized pursuant to this Article, the Contractor acknowledges and admits that the County will suffer damage, and that it is impracticable and infeasible to fix the amount of actual damages. Therefore, it is agreed by and between the Contractor and the County that the Contractor shall pay to the County as fixed and liquidated damages,
and not as a penalty, the sum specified in the Agreement for Construction for each calendar day of delay until the Date of Completion, and that both the Contractor and the Contractor's surety shall be liable for the total amount thereof, and that County may deduct Liquidated Damages from any monies due or that may become due to the Contractor. If it appears during the course of construction that the Contractor is behind schedule and the imposition of liquidated damages is likely, or if liquidated damages begin to accrue prior to the time for final payment, the amount accrued shall be withheld from any progress payment that would otherwise be due. This right to withhold funds is intended to complement the County's rights under Section 9.6.1.

This liquidated damages provision shall apply to all delays of any nature whatsoever, save and except only delays found to be excusable or compensable pursuant to Section 8.3, or time extensions granted by the County pursuant to Section 8.3.

Payment by the County of any progress payments after expiration of the Contract Time shall not constitute a waiver by the County of its right to claim liquidated damages in accordance with this Section.

8.3.6 Extension of Time Not a Waiver.

Any extension of time granted the Contractor pursuant to this Article shall not constitute a waiver by the County of, nor a release of the Contractor from the Contractor's obligation to perform this Contract in the time specified by the Agreement, as modified by the particular extension in question.

The County's decision to grant a time extension due to one circumstance set forth in one request, shall not be construed as a grant of an extension for any other circumstance or the same circumstance occurring at some other time, and shall not be viewed by the Contractor as a precedent for any other request for extension.

8.3.7 Suspensions Exceeding One Year.

Should the Work be suspended for a period exceeding one calendar year due to war conditions, labor conditions, legal actions, or for other conditions constituting the legal defense of impossibility of performance, the Contractor and County agree to enter into an agreement terminating the Agreement upon the following terms and conditions.

County shall be responsible only to pay the Contractor the actual value of the work performed from the Date of Commencement or from the date of the last progress payment, whichever is later, plus the five percent (5%) retention from such prior progress payments, less any deductions authorized by the Contract Documents.

As between the Contractor and County, it shall be conclusively presumed that the actual value for the Contractor's work to the date of the last progress payment is no more than the actual amount of that prior progress payment plus the five percent (5%) retention from such progress payments; provided, however, that this Section shall not preclude County from deducting charges for work or materials which do not meet the requirements of the Contract Documents.


8.3.8 **Effect of Stop Work Notice.**

If the County orders a suspension of the Work pursuant to Article 14, the days on which the suspension is in effect shall be included in determining the required completion date, and shall not otherwise modify or extend the time within which the Contractor is to perform. In such event, the Contractor shall not be entitled to any damages or compensation on account of such suspension or delay, unless the Contractor can establish that Stop Work Notice was not warranted.

**ARTICLE 9
PAYMENTS AND COMPLETION**

9.1. **CONTRACT SUM**

9.1.1. The Contract Sum is stated in the County-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the County to the Contractor for the performance of the Work under the Contract Documents.

9.2. **SCHEDULE OF VALUES**

9.2.1. As part of the required post-bid submittals, and at least fourteen (14) days prior to the first payment application, the Contractor shall submit to the Construction Manager a Schedule of Values allocated to the various portions of the Work, prepared in such form and in sufficient detail to allow evaluation of the progress of construction. In no event shall an individual line item on a schedule of values exceed five percent of the Contract Sum. Labor, material, and subcontract costs shall be shown separately. Cost of Contract closeout shall be shown as an individual line item, up to five percent of the Contract Sum. All other General Conditions items should be prorated among the actual construction values. The Schedule of Values shall be supported by such data to substantiate its accuracy as the Construction Manager may require. This schedule, unless objected to by the Construction Manager, shall be used only as a basis for the Contractor’s Applications for Payment.

9.3. **APPLICATIONS FOR PAYMENT**

9.3.1. At least fifteen (15) days before the date for each progress payment established in the County-Contractor Agreement, the Contractor shall submit to the Construction Manager an itemized Application for Payment, notarized if required, supported by such data substantiating the Contractor’s right to payment as the County or the Construction Manager may require, and reflecting retainage, if any, as provided elsewhere in the Contract Documents. AIA Documents G702, Application and Certificate for Payment and G703, Continuation Sheet, or other substitute form supplied and required by the County shall be used. Payment is expressly conditioned upon submission by the Contractor and all of its subcontractors and material suppliers warranting that title to all work, labor, materials and equipment covered by the application is free and clear of all liens, claims, security interests or encumbrances. Additionally, the Contractor and all of its subcontractors and material suppliers shall submit unconditional lien releases for all work through the prior progress payment. For final payment, the Contractor shall submit a notarized unconditional lien release. Waiver and Release forms must be submitted on forms provided or approved by the County of Tulare. Copies of said forms shall comply with Civil Code §3262.

9.3.2. No progress payment will be made unless all general conditions items (as-built updates, schedule updates, certified payroll or other pay records, lien releases, etc.) have been received by the Construction Manager in acceptable form. The onsite master set of drawings will be reviewed by the Construction Manager to verify that all changes have
been noted and that the drawings are current prior to the processing of any pay application.

9.3.3. Unless otherwise provided in the Contract Documents, payments may be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site and, if approved in advance by the County, payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the County to establish the County's title to such materials or equipment or otherwise protect the County's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site. Materials stored off-site, to be considered for payment, shall, in addition to the above requirements, be stored in a bonded warehouse, fully insured, and available to the Engineer and Construction Manager for inspection. The Construction Manager shall have complete discretion as to the amount of material and equipment that may be stored on the Site at any given time.

9.3.4. The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the County either by incorporation in the construction or on receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, stop notices, claims, security interest or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.3.5. Progress Payments:

.1 If the County does not pay the Contractor within thirty days after receipt of an undisputed and properly submitted payment request for a progress payment, excluding that portion of the final payment designated by the Contract as retention earnings, then the County shall pay interest to the Contractor as provided by Public Contract Code § 20104.50. Payment for Change Orders, if any, under this Contract shall be made in like manner. Said interest penalty is the sole recourse of Contractor and Contractor shall have no right to stop the Work until payment of the amount owing has been received, nor shall the Contract Time be extended, nor shall the Contract Sum be increased in any way, including by reason of any costs incurred by Contractor, except to the extent of said interest payment.
Pursuant to Public Contract Code § 7107, in the event of a dispute between the County and Contractor, the County may withhold from the final payment an amount not to exceed 150 percent of the disputed amount. Except as so provided, the County shall release the retention withheld within 60 days after the date of completion of the work of improvement, as “completion” is defined in Public Contract Code § 7107. In the event that retention payments are not made within the time periods required by Public Contract Code § 7107, the County may be subject to the interest provisions of Public Contract Code § 7107.

9.3.6. Refuge Substitutions and Escrow for Moneys Withheld to Insure Contractor’s Performance. Pursuant to Public Contract Code § 22300, the Contractor may deposit in an escrow, equivalent securities for any moneys withheld to insure performance and have said moneys paid directly to Contractor, or, in the alternative, have the County deposit such moneys directly into an escrow. Upon the closing of any such escrow, Contractor shall pay to each subcontractor, not later than 20 days after receipt of the closing payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the Contractor. Any escrow established pursuant to this article shall be with a state or federally chartered bank, shall be at the sole expense of the Contractor, and shall be established using an escrow agreement in substantially the following form:
This Escrow Agreement is made and entered into by and between the County of Tulare, (hereinafter called "County"), _____________________________________________________________________________________ (hereinafter called "Contractor"); and ____________________________, a state or federally chartered bank in California, (hereinafter called "Escrow Agent").

For the consideration hereinafter set forth, the County, Contractor, and Escrow Agent agree as follows:

1. Pursuant to Section 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 County pursuant to the Construction Contract entered into between the County and Contractor for __________________________ in the amount of $_______________________, and dated ______________ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the County shall make payments of the retention earnings directly to the escrow agent. When Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the County within ten (10) days of the deposit. The market value of the securities at the time of the substitution, as valued by the County, shall be at least equal to the cumulative total cash amount then required to be withheld as retention under the terms of the Contract between County and Contractor. If the County determines that the securities are not adequate it will notify Contractor and Escrow Agent, and Contractor shall deposit additional security as further determined by the County. Securities shall be held in the name of the County and shall designate the Contractor as the beneficial owner.

2. Upon the deposit of adequate securities, County shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions.

3. When the County, at Contractor's written request, makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as 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 County 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 County. These expenses and payment terms shall be determined by the County, 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 County.

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 County to the Escrow Agent that County consents to the withdrawal of the amount sought to be withdrawn by Contractor.

7. The County shall have the right to draw upon the securities or any amount paid directly to Escrow Agent in the event of default by the Contractor. Upon seven (7) days written notice to the Escrow Agent from the County of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash, including any amounts paid directly to Escrow Agent, as instructed by the County. Escrow Agent shall not be concerned with the validity of any notice of default given by County pursuant to this paragraph, and shall promptly comply with County's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to conflicting demands and hereby waives any present or future right of interpleader.
8. Upon receipt of written notification from the County 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 payment of fees and charges.

9. Escrow Agent shall rely on the written notifications from the County and Contractor pursuant to Sections (3), (5), (6), (7) and (8) of this Escrow Agreement and the County and Contractor shall hold Escrow Agent harmless from Escrow Agent’s release and disbursement of the securities and interest as set forth above.

10. Securities eligible for investment under this Escrow Agreement, as provided by Public Contract Code § 22300, shall be those listed in Section 16430 of the Government Code, 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 County.

11. The venue of any litigation concerning the rights and obligations of the parties to this Escrow Agreement shall be the County of Tulare and the removal provisions of Code of Civil Procedure Section 394 shall not apply to any such litigation.

12. The names of the persons who are authorized to give written notice or to receive written notice on behalf of the County and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

**On behalf of County:**

Title  
Name  
Signature  
Address

**On behalf of Contractor:**

Title  
Name  
Signature  
Address

**On behalf of Escrow Agent:**

Title  
Name  
Signature  
Address

At the time the Escrow Account is opened, the County and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Escrow Agreement.
IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

**County:**
- Title
- Name
- Signature
- Address

**Contractor:**
- Title
- Name
- Signature
- Address

**Escrow Agent:**
- Title
- Name
- Signature
- Address
Either alternative under this Section may be exercised only if requested in writing by the Contractor within five (5) days after receipt of Notice of Intent to Award. The Contractor shall notify its subcontractors in writing within fifteen (15) days of exercising this option.

9.3.7 **Itemized Breakdown:** The Contractor shall submit a financial breakdown of the work, itemized by crafts or sections as designated by the Construction Manager. The Contractor's payment shall be based upon the monthly percentage of completion of these items.

9.3.8 **Lien Waivers:** The County or Construction Manager may require the Contractor to submit, along with the progress payment request, notarized lien waivers from each subcontractor, materials or equipment supplier. Lien waivers shall comply with Civil Code § 3262. The aggregate sum of which shall reflect previous progress payments.

9.4. **CERTIFICATES FOR PAYMENT**

9.4.1. The Construction Manager will, within seven days after the receipt of the Project Application for Payment, review the Project Application for Payment and either issue a Project Certificate for Payment to the County for such amounts as the Construction Manager determines are properly due, or notify the Contractor in writing of the reasons for withholding a Certificate as provided in Subparagraph 9.6.1. The application for payment shall be made on AIA Documents G702 and G703 of the latest edition, in triplicate.

9.4.2. The issuance of a Project Certificate for Payment will constitute a representation by the Construction Manager, Engineer and Inspector to the County that, based on their observations at the site as provided in Subparagraph 2.2.4 and the data comprising the Project Application for Payment, the Work has progressed to the point indicated; that, to the best of the Construction Manager's, Engineer's and Inspector's knowledge, information and belief, the quality and timeliness of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion of the Work, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in the Certificate); and that the Contractor is entitled to payment in the amount certified. However, by issuing a Project Certificate for Payment, the Construction Manager, Engineer and Inspector shall not thereby be deemed to represent that they have made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, have reviewed the construction means, methods, techniques, sequences or procedures, or have made any examination to ascertain how or for what purpose the Contractor has used the monies previously paid on account of the Contract Sum.

9.5. **PROGRESS PAYMENTS**

9.5.1. After the Construction Manager has issued a Project Certificate for Payment, the County shall make payment in the manner and within the time provided in the Contract Documents.

9.5.2. The Contractor shall promptly pay each Subcontractor upon receipt of payment from the County, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with
each Subcontractor, require each Subcontractor to make payments to their Sub-
subcontractors in similar manner.

9.5.3. The Construction Manager may on request, at the Construction Manager's discretion, 
insist to any Subcontractor, if practicable, information regarding the percentages of 
completion or the amounts applied for by the Contractor and the action taken thereon 
by the Construction Manager on account of Work done by such Subcontractor.

9.5.4. Neither the County nor the Construction Manager shall have any obligation to pay or 
to see to the payment of any monies to any Subcontractor or Material Suppliers except 
as may otherwise be required by law.

9.5.5. Neither certification of a progress payment, delivery of a progress payment, nor partial 
or entire use or occupancy of the Project by the County, shall constitute an 
acceptance of any Work not in accordance with the Contract Documents.

9.6. PAYMENTS WITHHELD

9.6.1. The Construction Manager may decline to certify payment and may withhold the 
Certificate in whole or in part to the extent necessary to reasonably protect the 
County, if, in the Construction Manager's opinion, the Construction Manager is unable 
to make representations to the County as provided in Subparagraph 9.4.2. If the 
Construction Manager is unable to make representations to the County as provided in 
Subparagraph 9.4.2, and to certify payment in the amount of the Project Application, 
the Construction Manager will notify the Contractor as provided in Subparagraph 9.4.1. 
If the Contractor and the Construction Manager cannot agree on a revised amount, 
the Construction Manager will promptly issue a Project Certificate for Payment for the 
amount for which the Construction Manager is able to make such representations to 
the County. The Construction Manager may also decline to certify payment or, 
because of subsequently discovered evidence or subsequent observations, the 
Construction Manager may nullify the whole or any part of any Project Certificate for 
Payment previously issued to such extent as may be necessary, in the Engineer's 
opinion, to protect the County from loss because of:

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of 
such claims, including claims by separate contractors;
3. failure of the Contractor to make payments properly to Subcontractors, or 
for labor, materials or equipment;
4. reasonable evidence that the Work cannot be completed for the unpaid 
balance of the Contract Sum;
5. damage to the County or another contractor;
6. reasonable evidence that the Work will not be accomplished in 
compliance with the Contract Time;
7. persistent failure to carry out the Work in accordance with the Contract 
Documents or stop notice served upon the County.
8. Failure of the Contractor to comply with any lawful or proper direction 
concerning the Work given by any County representative authorized to have 
given such instruction;
9. Claims and/or penalties which state law assesses against the Contractor for 
violation of such law;
10. Any claim or penalty asserted against the County by virtue of the 
Contractor's failure to comply with the provisions of all governing laws, 
ordinances, regulations, rules, and orders;
11. Any liquidated damages which may accrue as a result of the Contractor's
progress failing to meet the schedule milestones or failing to achieve completion within the Contract Time.

subsection 9.6.2. When the grounds in Subparagraph 9.6.1 above are removed, payment shall be made for amounts withheld because of them.

In order to adequately protect the County, the Contractor agrees that the basic standard to determine the amount to be withheld pursuant to this Section shall be one hundred fifty percent (150%) of the amounts claimed or the value of the work not done or defectively done; provided, however, that County reserves the authority to retain greater sums should such sums be necessary in the County's discretion to adequately protect it.

**Disbursement of Withheld Amounts.**
The County, in its sole discretion, may apply any withheld amount or amounts to the payment of any claim resulting in a withhold. The Contractor agrees and hereby designates the County as its agent for such purposes, and any payment so made by the County shall be considered as a payment made under this Contract by the County to the Contractor. The County shall not be liable to the Contractor for any payments made in good faith. Such payments may be made without a prior judicial determination of the claim or claims. The County shall render to the Contractor a proper accounting of any funds disbursed on behalf of the Contractor.

Prior to disbursing any amounts, County shall afford the Contractor an opportunity to present good cause, if any it has, why the claim or claims in issue are not valid or just claims against the Contractor. The County reserves the right then to take such further steps as are appropriate, in its sole discretion, including, but not limited to, seeking a judicial resolution of the controversy.

**Correction of Statement and Withholding of Payment.**
No inaccuracy or error in any statement provided by the Contractor shall operate to release the Contractor or any surety from the error, or from damages arising from such work, or from any obligation imposed by the Contract Documents. The County shall retain the right subsequently to correct any error made in any previously issued claim for the progress payment, or progress payment issued, by adjustments to subsequent payments.

**Effect of Progress Payments.**
Neither the payment, the withholding, nor the retention of all or any portion of any progress payment claimed to be due and owing to the Contractor shall operate in any way to relieve the Contractor from its obligations under this Agreement. The Contractor shall continue diligently to prosecute the Work without reference to the payment, withhold, or retention of any progress payment. The payment, withhold, or retention of any progress payment shall not be grounds for an extension of the Contract Time.

**SUBSTANTIAL COMPLETION, INSPECTION, AND OCCUPANCY BY COUNTY**

subsection 9.7.1. **Notice of Punch List Inspection.**
When the Contractor believes that a phase of its Work is complete, it shall request in writing a punch list inspection. Within five (5) days of the receipt of such request, the Construction Manager and the Engineer shall make a punch list inspection or inform the Contractor that the work is not ready for punch list inspection; upon completion of the deficient work, the Contractor shall again request a punch list inspection. The Contractor or its representatives shall be present at the punch list inspection. The purpose of the punch list inspection is to
determine whether the Work has been completed in accordance with the Contract Documents, including all Change Orders, all interpretations and instructions previously issued.

If Contractor fails to attend any punch list inspection, the Contractor shall be charged for the cost of the Construction Manager, Engineer, the Inspector, and other design professionals who attended the punch list inspection.

Punch List.
The Construction Manager and the Engineer shall notify the Contractor in writing of any deficiencies to be remedied prior to final acceptance, by preparing a written list, known in the industry as a punch list.

The Contractor shall remedy all items shown on the punch list prior to final acceptance by the Construction Manager and the Engineer.

No one is authorized to amend the Contract Documents by use of the punch list; it is provided solely for the benefit of the Contractor to enable him to determine what items must be corrected before final acceptance will be recommended by the Construction Manager and the Engineer. The County reserves the right to require compliance with the Contract Documents, notwithstanding the issuance of a punch list or the completion by the Contractor of all items on the punch list.

In the event that the Work still does not comply with the Contract Documents, the County reserves the right to issue such further punch lists as may be required, or to deduct from the final payment the cost of correcting any work not completed in accordance with the Contract Documents, but accepted by the County, without the issuance of further punch lists.

If punch list work needs to be performed after the County has taken occupancy of a phase, the work shall be conducted outside of normal operating hours at the direction of the Construction Manager.

9.7.2. Use of Work Prior to Acceptance. Whenever, in the opinion of the County, the Work or any part thereof, is in a condition suitable for use, and the best interests of the County require such use, the County may take possession of, connect to, and open for public or County use that portion of the Work.

9.7.3. Repairs or Renewals in the Work. Prior to the Date of Completion, the Contractor shall make all repairs or renewals in the portion of the Work occupied made necessary due to defective material or workmanship, or the operations of the Contractor, ordinary wear and tear accepted.

9.7.4. Effect of Occupancy. The County occupancy as contemplated in this Article shall not constitute acceptance by the County of the Work or any part thereof. Such use shall neither relieve the Contractor of any of its responsibilities under the Contract Documents, nor act as a waiver by the County of any of the terms or conditions of the Contract Documents. Any damage done by the County is the responsibility of the County.

9.7.5. Coordination with Other Activities. The Contractor shall conduct its operations so as not to interfere unreasonably with the County's use of the occupied portions of the site. The Contractor shall submit periodic schedules to the Construction Manager proposing the times, areas, and types of work to be done within such areas.
If the work produces conditions rendering the occupied portions of building, the Site, or other areas uninhabitable, either because of noise, dust, vibration, smoke, fumes, or for any other cause whatsoever, the Construction Manager may suspend the Work or direct the Contractor to modify the Construction Schedule, and the Contractor shall comply.

Except as provided by Change Order, the Contractor shall not be entitled to a time extension or increase in the Contract Sum by virtue of conflicts between the Contractor’s work and the County’s occupancy.

9.7.6. Warranties required by the Contract Documents shall commence on the date of the recording of the Notice of Completion on the Project.

9.8 FINAL COMPLETION, CONTRACT CLOSEOUT AND FINAL PAYMENT

9.8.1. Contractor’s Request for Final Payment. When the Contractor determines that the Contract is complete and all items on the punch list have been satisfied, or contends that such items are not required by the Contract Documents, the Contractor shall submit a request for final payment.

9.8.2. Additional Submissions. Simultaneously with the Contractor’s request for final payment, the Contractor shall submit the following items to the Construction Manager:
   .1 As-built drawing information pursuant to Section 4.11.3.
   .2 Three (3) sets of documentation completely covering the operation and maintenance of the mechanical and electrical installation, elevators, kitchen equipment, and all other equipment required by the technical specifications to be furnished with such manuals. The documentation shall include charts, diagrams, performance curves, catalog information, lubrication manuals, and details pertaining to the functioning of various items of equipment. The documentation shall be divided logically into “systems” on the basis of operation, without respect to trades, subcontractors or arbitrary specifications sections. The relationship of the “systems” shall be clearly and concisely detailed.

No payment will be processed unless accompanied by the listed documents in acceptable form.

Final Estimate.
Upon receipt of the submittals required by this Article, the Construction Manager shall prepare a written estimate of the sum due to the Contractor. This estimate shall take into account the Contract Sum, as adjusted by any Change Orders; amounts already paid; and sums to be retained for incomplete work and for any other cause under the Contract Documents.

The Engineer shall prepare a statement of final inspection, stating that the Work has been given a final inspection, that the Contractor has submitted the required documents, setting forth with detail any deviations in the Work as completed from the Contract Documents, and estimating the cost of correction of such deviations.

The Engineer’s statement shall be transmitted to the County along with the Contractor’s request for final payment. The Construction Manager shall provide a copy of the Engineer’s statement of final inspection and the Construction Manager’s estimate of the sum due to the Contractor.

If the Contractor contests the estimate of sums due prepared by the Construction Manager,
within seven (7) calendar days following service of Construction Manager's estimate of the sum due, the Contractor shall file its protest in writing with the County, setting forth in detail all grounds alleged by it to justify an adjustment to the Construction Manager's final estimate. Failure to file a timely protest shall constitute a waiver and acceptance by the Contractor of the Construction Manager's estimate.

Notice of Completion and Acceptance of Contract.
Acceptance of the Work by the County and the recordation of a Notice of Completion shall be in the manner prescribed by law, provided that the Work shall then be fully and satisfactorily completed and the provisions of the Contract Documents fully and satisfactorily performed in all respects.

Certificate of Final Payment.
Within ten (10) days after the recordation of the Notice of Completion, the County shall present a certificate of final payment stating the entire balance found to be due the Contractor. The amount set forth in that certificate shall then be due and payable, less retentions due to stop notices.

Approval of Final Payment.
Following receipt of the certificate of final payment by the County, the County shall authorize final payment to the Contractor in the sum specified on the certificate of final payment, subject to retentions for stop notices as provided in Article 14. Final payment shall be made within sixty (60) days after recordation of the Notice of Completion and in accordance with Public Contract Code Section 7107.

Withholding for Stop Notices.
The County may, in its sole discretion, and at any time, withhold from the Contractor any unpaid claims alleged in Stop Notices filed pursuant to Civil Code Section 9352 et seq. The County reserves all remedies it may have in the event of a stop notice dispute. The basic standard to determine a sufficient withholding in the event of a Stop Notice shall be one hundred fifty percent (150%) of the total of all stop notices filed; provided, however, the County reserves the right to withhold different or greater sums in its discretion.

Non-Waiver.
Neither acceptance of, nor payment for, the Work or any part thereof, nor any extension of time, nor any possession taken by County shall operate as a waiver of any of the provisions of this Contract, nor shall a waiver of any breach of this Contract be held to be a waiver of any other or subsequent breach. In addition, recordation of a Notice of Completion shall not be deemed an acceptance of latent defects, nor shall it constitute a waiver of any of the provisions of this Agreement.

9.8.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by the issuance of Change Orders affecting final completion, and the Construction Manager so confirms, the County shall, upon application by the Contractor and certification by the Construction Manager, non terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Construction Manager prior to certification of such payment. Such payment shall be made under the Terms and Conditions governing final payments, except that it shall not constitute a waiver of claims. AIA Documents G707, Consent of Surety Company to Final Payment or if appropriate G707-A, Consent of Surety

GENERAL CONDITIONS 000700 - 56
to Reduction in or Partial Release of Retainage, shall be used.

9.8.4 The acceptance of final payment shall, after the Date of Substantial Completion of the Project, constitute a waiver of all claims by the Contractor.

9.8.5 All provisions of this Agreement, including without limitation those establishing obligations and procedures, shall remain in full force and effect notwithstanding the making or acceptance of final payment.

ARTICLE 10
PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The responsibility for maintaining a safe working site shall be the Contractor’s, and the County and Construction Manager undertake no obligation to suspend the work or notify the Contractor of any hazardous conditions or noncompliance with safety laws.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

.1 all employees on the Work and all other persons who may be affected thereby;

.2 all the work and all materials and equipment to be incorporated therein, whether in storage or off the site, under the care, custody or control of the Contractor or any of the Contractor’s Subcontractors or Sub-subcontractors;

.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and

.4 the work of the County or other separate contractors.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and the progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying County and users of adjacent facilities. The Contractor shall enforce any instructions from the Construction Manager or County regarding placement of signs, fires, danger signals, barricades, radios, noise and smoking.

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
10.2.5 The Contractor shall promptly remedy all damage or loss to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, anyone directly or indirectly employed by any of them, or any one for whose acts any of them may be liable, and for which the Contractor is responsible under Clauses 10.2.1.2 and section 10.2.1 subsection iii, except damage or loss attributable solely to the acts or omissions of the County, the Construction Manager, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 4.17.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the County and the Construction Manager.

10.2.7 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.2.8 Traffic Signs and Traffic Control
   .1 Existing signs, lights, traffic signals, control boxes, hydrants, meters, and other similar items occurring within the street or sidewalk areas shall be kept free of obstructions and accessible at all times. All such items shall be protected from the Contractor's operations and shall not be obliterated or obscured by its equipment or materials.
   .2 Should it be necessary to cover up, move, or alter such items, this shall be done only with permission of the authorities having jurisdiction over the items involved.
   .3 Should it be necessary to block a street or sidewalk, the Contractor shall first notify the Construction Manager and the police and fire departments and other agencies with jurisdiction, and shall comply with their instructions, including scheduling limitations.

10.2.9 Security of the Site
   .1 The Contractor's attention is directed to Specifications Section 01500 (if applicable) regarding requirements for fencing the Site, gates, and screening. The Contractor's attention is further directed to the security requirements in the Construction Administrative Procedures Manual.

10.2.10 Removal of Barricades
   .1 Upon completion of the Work, the Contractor shall remove from the site all materials used for barricades, temporary scaffolding, or any other temporary uses.

10.2.11 Protection of Adjacent Property; Notices
   .1 In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin, and protect as may be necessary all foundations and other parts of all existing structures on the Site or adjacent to the Site which are in any way affected by the excavations or other operations connected with the completion of the Work.
   .2 Prior to excavation, the Contractor shall notify all public utilities and governmental agencies of the work proposed, and shall ascertain from them the exact location of their utilities.
.3 Prior to commencing any work which in any way affects adjoining or adjacent land or buildings thereon, or public utilities, the Contractor shall notify the Construction Manager, who will send the County and occupants thereof a notice, which specifies the type of work to be done, the schedule of the work, the impacts expected from the work, and the protective measures being taken by the Contractor. The notice shall also specify that any person receiving notice who has questions regarding it may contact the Construction Manager.

.4 Whenever any notice is required to be given to any adjoining or adjacent landowner, utility, governmental agency or other party before commencement of any work, the notice shall be given by the Contractor at least seven days in advance of the work, or longer if required by law or regulation, with a copy delivered to the Construction Manager.

.5 The Contractor shall, at the written instruction of the Construction Manager, meet with any recipient of such notice to explain and discuss the proposed work.

10.2.12 Fire Protection.

.1 The Contractor shall take all steps necessary to protect all structures from fires and sparks originating from the Work, shall comply with all laws and regulations regarding fire protection, and shall comply with all instructions of the fire department with jurisdiction.

.2 The Contractor shall notify the Construction Manager and the fire department in writing at least 72 hours prior to disconnection of either water or electrical service to the site, and shall comply with the fire department’s instructions regarding fire safety.

10.2.13 Valley Fever

.1 Coccidioidomycosis, also known as “Valley Fever” or “coccii”, is a disease caused by Coccidioides fungi which infect the lungs. When the fungus spores present in soil are disturbed, the spores may become airborne and can be inhaled. Contractor is hereby notified that the spores which cause Valley Fever are endemic to Tulare County. Activities which disturb soil or expose workers to dust, such as digging, operating earth-moving equipment, driving vehicles, and working in wind-blown areas, may increase the risk of Valley Fever in workers. Information regarding preventing and recognizing the symptoms of Valley Fever are available from the California Department of Public Health and the California Department of Industrial Relations. The provisions of this section shall be made a part of every subcontract executed pursuant to this Contract.

10.2.14 Repairs or Replacement

.1 Any damage to existing conditions, or to any other improvement or property above or below the surface of the ground, whether private or public, arising from performance of this Contract shall be repaired within 48 hours by the Contractor without expense to the County, unless disruption of existing facility operations or creation of a safety hazard has occurred, in which case damage will be corrected immediately.

.2 If, in the opinion of the Engineer, the best interest of the County requires that repairs be made prior to the execution of any further work, the Construction Manager will notify the Contractor who shall delay or discontinue that part of the Work until the necessary repair has been made. Such delay shall not be considered unavoidable and no extension of the Contract Time will be granted therefore.
Upon the failure of the Contractor to comply with any such order, or upon the Contractor's failure to make immediate emergency repairs which are necessary to protect the Work, the County shall do that work itself as is necessary to protect life and property, in its sole discretion, and deduct the total cost of such work from the next progress payment. No prior notice to the Contractor shall be necessary for the County to take this action.

10.3 **EMERGENCIES**

10.3.1 In any emergency affecting the safety of persons or property, including adjoining property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. The Contractor shall immediately notify the Construction Manager of such actions. Any costs to the Contractor for expenditures or time shall be borne by the Contractor.

**ARTICLE 11**

**INSURANCE**

11.1 **CONTRACTOR'S INSURANCE**

11.1.1 Bidders and their subcontractors attention is directed to the insurance requirements below. It is highly recommended that Bidders confer with their respective insurance carriers or brokers to determine in advance of bid submission the availability of insurance certificates and endorsements as prescribed and provided herein. If an apparent low bidder fails to comply strictly with the insurance requirements, that Bidder may be disqualified from award of the Contract and forfeits its Bid Bond.

11.1.2 Contractor and subcontractors shall provide and maintain insurance for the duration of the warranty period against claims for injuries to persons and damage to property, which may arise from, or in connection with, performance under the Agreement by the CONTRACTOR, its agents, representatives, employees or subcontractors, if applicable.

11.1.3 **Minimum Scope & Limits of Insurance**

.1 Coverage at least as broad as Commercial General Liability, insurance Services Office Commercial General Liability coverage occurrence form GC 00 01, with limits no less than $4,000,000 per occurrence including products and completed operations, property damage, bodily injury and personal & advertising injury. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (ISO CG 25 03 or 25 04) or the general aggregate limit shall be twice the required occurrence limit.

.2 Comprehensive Automobile Liability Insurance of $1,000,000 per occurrence for bodily injury and property damage. If the annual aggregate applies it must be no less than $2,000,000.

.3 Workers' Compensation Insurance as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than $1,000,000 per accident for bodily injury or disease.

.4 Builders' Risk:
The County will provide Builder’s Risk Insurance. Bidders are to exclude the cost of Builder’s Risk Insurance from their bid.

11.1.4 Specific Provisions of the Certificate

.1 If any of the required insurance is written on a claims made form, the retroactive date must be before the date of the Contract or the beginning of the Contract work and must be maintained and evidence of insurance must be provided for at least five (5) years after completion of the Contract work.

.2 The General Liability and Automobile Liability policies are to be endorsed to contain the following provisions:

.3 The COUNTY, its officers, agents, officials, employees and volunteers are to be covered as additional insureds as respects liability arising out of work or operations performed by or on behalf of the Contractor, or automobiles owned, leased, hired or borrowed by the CONTRACTOR.

.4 For any claims related to this project, the CONTRACTOR’s insurance coverage shall be primary insurance as respects the COUNTY, its officers, agents, officials, employees and volunteers. Any insurance or self-insurance maintained by the COUNTY, its officers, agents, officials, employees or volunteers shall be excess of the CONTRACTOR’s insurance and shall not contribute with it.

.5 CONTRACTOR hereby agrees to waive rights of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. CONTRACTOR agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation.

.6 Each insurance policy required by this Agreement shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days prior written notice has been provided to the County.

11.1.5 The Workers’ Compensation policy shall be endorsed with a waiver of subrogation in favor of the County for all work performed by the CONTRACTOR, its employees, agents and subcontractors:

.1 Waiver of Subrogation. The workers’ compensation policy shall be endorsed with a waiver of subrogation in favor of the COUNTY for all work performed by the CONTRACTOR, its employees, agents and subcontractors. CONTRACTOR waives all rights against the COUNTY and its officers, agents, employees and volunteers for recovery of damages to the extent these damages are covered by the workers compensation and employers liability. CONTRACTOR waives all rights against the DISTRICT and its officers, agents, employees and volunteers for recovery of damages to the extent these damages are covered by the workers compensation and employers liability.

.2 Deductibles and Self-Insured Retentions

Self-insured retentions must be declared and any deductible over $100,000 shall be forwarded to the Risk Manager for review and approval.
11.1.6 Acceptability of Insurance
   Insurance must be placed with insurers with a current rating given by A.M. Best and Company of no less than A:VII and a Standard & Poor's Rating (if rated) of at least BBB and from a company approved by the Department of Insurance to conduct business in California. Any waiver of these standards is subject to approval by the County Risk Manager.

11.1.7 Verification of Coverage
   Prior to approval of this Agreement by the COUNTY, the CONTRACTOR shall file with the submitting department, certificates of insurance with original endorsements effecting coverage and a copy of the declarations page from the policy in effect in a form acceptable to the COUNTY. Endorsements must be signed by persons authorized to bind coverage on behalf of the insurer. The COUNTY reserves the right to require certified copies of all required insurance policies at any time.

11.2 ADDITIONAL CONSTRUCTION INSURANCE REQUIREMENTS:

11.2.1 Payment Bond: For public works projects of more than $25,000 a “payment bond” is required in the full amount of the Contract price, and shall insure to the benefit of persons performing labor or furnishing materials in connection with the work of the Contract. This bond shall be maintained in full force and effect until all work under the Contract is completed and accepted by the COUNTY, or until all claims for materials and labor have been paid, whichever is longer.

11.2.2 Performance Bond: For public works projects of more than $25,000 a “performance bond” is required in the full amount of the Contract price and shall insure the faithful performance by Contractor of all work under the Contract. It shall also insure the replacing of, or making acceptable, any defective materials or faulty workmanship.

11.2.3 Acceptability of Surety: Only California admitted sureties with current AM Best Rating of no less than VII.

ARTICLE 12
CHANGES IN THE WORK

12.1 CHANGE ORDERS

12.1.1 Definition: A Change Order is a written order to the Contractor signed to show the agreement of the County, the Contractor, the Engineer, and the Construction Manager issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time shall be changed only by Change Order. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including the adjustment in the Contract Sum or the Contract Time, for full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.

12.1.2 Subject to legal requirements relating to competitive bidding, the County, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletion or other revisions, the Contract Sum and Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.
PCO/Work Orders.
Changes also may be made pursuant to a PCO/Work Order, which shall direct a change in the Work and state a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. A PCO/Work Order shall be used in the absence of total agreement on the terms of a Change Order, or when time does not permit processing of a Change Order prior to implementation of the change. Work completed under a PCO/Work Order not yet converted to a Change Order may be billed on progress billings only to an amount that does not cause the total billing to exceed 85% of Contract value as modified by approved change orders.

Upon receipt of a PCO/Work Order, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager within five (5) calendar days of the Contractor’s agreement or disagreement with the method, if any, provided in the PCO/Work Order for determining the proposed adjustment in the Contract Sum or Contract Time.

Failure to respond to and return a PCO/Work Order to the County within five (5) days indicates the Contractor’s agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

Costs mean an itemized breakdown of all labor (by crafts), materials, sales taxes, large equipment rentals, etc., for each portion of the Work which comprises the change order including any subcontractor’s itemized breakdown.

The Contractor’s combined overhead and profit for work performed by its own forces shall be fifteen percent (15%) of the costs. If the changed work is performed by a Subcontractor, the Subcontractor shall also be entitled to an allowance of fifteen percent (15%) of its labor costs for overhead and profit, and fifteen (15%) of its material costs. The Contractor shall be allowed to mark-up the Subcontractor’s price five (5%) for its overhead and profit. Cumulative total markup for all tiers of contractors and subcontractors shall not exceed twenty percent (20%).

The cost or credit to the County resulting from a change in the Work shall be determined in one or more of the following ways:

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

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

.3 by cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 by the method provided in Subparagraph 12.1.3.1 and 12.1.3.2.

.5 A “cost plus” adjustment subject to the following limitations:

a. Record Keeping. In the event that the pricing method selected is the “cost plus” method described above, the Contractor shall keep and present daily, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data of the labor, materials, and equipment used during that day. All labor shall
be recorded on separate time sheets clearly identified with the PCO/WO number and scope of extra work involved. These time sheets shall be signed daily by the Inspector or the Construction Manager. No costs will be allowed for time not recorded and signed the same day the work takes place. The Contractor and the Construction Manager shall discuss and attempt to resolve any disputes concerning the Contractor’s daily records at the time the report is submitted.

b. **Reconciliation.** The Contractor shall on a monthly basis accompany the progress payment request submit a reconciliation for all work performed under a cost plus PCO during the period of the progress payment. A final reconciliation shall be submitted within 30 days after the work of the PCO is completed. The reconciliation shall recap all costs and appropriate markups for the period. No costs will be allowed for work not included in a reconciliation within the time periods specified.

12.1.3 If none of the methods set forth in Clauses 12.1.2.1, 12.1.2.2, or 12.1.2.3 is agreed upon, the Contractor, provided that a written order signed by the County is received, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Construction Manager, on the basis of reasonable expenditures or savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit as specified below. In such case, and also under Clause 12.1.2.3 above, the Contractor shall keep and present, in such form as the County or the Construction Manager may prescribe, an itemized accounting of actual cost together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor including social security, Medicare and unemployment insurance and fringe benefits required pursuant to Section 15.9; workers' or workmen's compensation insurance; rental value of equipment and machinery exclusive of small tools, whether rented from the Contractor or others; and the additional costs of supervision as follows:

12.1.3.1 Costs of first line supervision labor, including labor burden as described in 12.1.3. "First Line Supervision" shall mean a working foreman or lead craft worker other than the project superintendent;

12.1.3.2 Actual cost of the project superintendent associated with any period of compensable delay caused by issuance of the change order. In the absence of a compensable delay, all of the project superintendent’s time is considered to have been paid for as part of the overhead;

Upon determination of cost by the Construction Manager, payments to the Contractor may be made based on the Construction Manager's approval of a Project Certificate for Payment. If the Contractor disputes the Construction Manager's cost determination, the Contractor may initiate a claim per the claims and disputes resolution provisions of Paragraph 7.4.

"Overhead" shall include the following: Preparation of all paperwork related to changes in the Work, including field review, estimating and cost breakdown; coordination and supervision, both office and field, including the project superintendent; vehicles including gas and maintenance; small tools, incidentals and consumables; engineering, detailing, and revisions to shop drawings and as-built drawings; general office expense; extended and unabsorbed home office overhead; warranty; costs of bonds, liability insurance, and all taxes; and all other expenses not
specifcally included in Section 12.1.3 above.

The amount or credit to be allowed by the Contractor or subcontractor to the County, as confirmed by the Construction Manager, for any deletion or change that results in a decrease in the Contract Sum will be the amount of the actual net cost plus five percent (5%) for overhead and profit. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase or decrease, if any, with respect to that change.

12.1.4 Variation in Estimated Quantities: If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated as so changed in a proposed Change Order, that application or the agreed unit prices to the quantities of Work proposed will cause substantial inequity to the County or the Contractor, the applicable unit prices shall be equitably adjusted.

Effect on Sureties.

All changes authorized by the Contract Documents may be made without notice to or consent of the sureties on the Contract bonds, and shall not reduce the sureties' liability on the bonds.

The County reserves the right to require additional payment or performance bonds to secure a change order.

12.2 CONCEALED CONDITIONS

12.2.1 If this Contract requires the digging of trenches or other excavations that extend deeper than four feet below the existing surface, the following provision shall apply to those trenches or excavations:

12.2.1.1 In the event that any of the following described conditions is suspected to exist in the trench or excavation, the Contractor shall promptly, and before the condition is disturbed, notify the Construction Manager, in writing, of any:

a. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

b. Subsurface or latent physical conditions at the site differing materially from those indicated.

c. Unknown physical conditions at the site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

12.2.1.2 Upon receipt of notice from the Contractor, the Construction Manager, the County and the Engineer shall promptly investigate the conditions, and if it is determined that the conditions do materially so differ or do involve hazardous waste, and cause a decrease or increase in the
Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a Change Order or PCO/Work Order under the procedures described in 12.3.

12.2.1.3 In the event that a dispute arises between the County and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract Documents, but shall proceed with all work to be performed under the Contract Documents. The Contractor shall retain any and all rights provided either by the Contract Documents or by law which pertain to the resolution of disputes and protests between the contracting parties.

12.3 REQUEST FOR EQUITABLE ADJUSTMENT

12.3.1 If the Contractor considers a Request for Equitable Adjustment is justified for an increase in the Contract Sum or Time, the Contractor shall promptly, upon first observance of the condition giving rise to the request, provide the Construction Manager and County written notice of such condition and circumstance. This notice shall be given by the Contractor before proceeding to execute the Work, except in emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 10.3. No such request shall be valid unless so made. Any change in the Contract Sum or Time resulting from such request for equitable adjustment shall be authorized by Change Order.

12.3.2 If the Contractor requests that additional cost or time is involved because of, but not limited to, (1) any written interpretation pursuant to Subparagraph 2.2.8, (2) any order by the County to stop the Work pursuant to Paragraph 3.3 where the Contractor was not at fault, or any such order by the Construction Manager as the County's agent, (3) any written order for a minor change in the Work issued pursuant to Paragraph 12.4, the Contractor shall make such request for equitable adjustment as provided in Subparagraph 12.3.1.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Construction Manager will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be enacted by written order issued through the Construction Manager, and shall be binding on the County and the Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 13
UNCOVERING AND CORRECTION OF WORK

13.1  UNCOVERING OF WORK

13.1.1 If any portion of the Work should be covered contrary to the request of the Construction Manager or to requirements specifically expressed in the Contract Documents, it must, if
13.1. If any other portion of the Work has been covered which the Construction Manager has not specifically requested to observe prior to it's being covered, the Construction Manager may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the County. If such Work is found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the County or a separate Contractor as provided in Article 5 in which event the County shall be responsible for the payment of such costs.

13.2. **CORRECTION OF WORK**

13.2.1. The County shall have the right to reject materials and workmanship which are determined by the Construction Manager, the Engineer, or the Inspector to be defective or fail to comply with the Contract Documents. Rejected workmanship shall be corrected satisfactorily, and rejected materials shall be removed from the premises and replaced, all without cost to the County.

13.2.2. The Contractor shall correct, within seven (7) days, all Work rejected by the Construction Manager as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion of the Work and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Construction Manager's additional services made necessary thereby.

13.2.3. If, within 3 years after the recording of the Notice of Completion of the Work or designated portion thereof, or within 3 years after acceptance by the County of designated equipment, or within such longer period of time as may be prescribed by the terms of any applicable special warranty required by the Contract Documents, any of the Work to be found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the County to do so, unless the County has previously given the Contractor a written acceptance of such condition. This obligation shall survive both final payment for the Work or designated portion thereof and termination of the Contract. The County shall give such notice promptly after discovery of the condition.

13.2.4. The Contractor shall, at its sole expense, remove from the site all portions of the Work, which are defective or nonconforming and which have not been corrected under Subparagraphs 4.5.1, 13.2.1 and 13.2.3, unless removal is waived by the County.

13.2.5. If the Contractor fails to correct defective or nonconforming Work as provided in Subparagraphs 4.5.1, 13.2.1 and 13.2.2, the County may correct it in accordance with Paragraph 3.4.

13.2.6. If the Contractor does not proceed with the correction of such defective or nonconforming Work within a reasonable time fixed by written notice from the Construction Manager, the County may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the County may, upon ten additional days' written notice, sell such Work at auction or at private sale and shall account for the proceeds thereof, after deducting all the costs that should have been borne by the
Contractor, including compensation for the Construction Manager, Engineer or other Professional's additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the County.

13.2.7. The Contractor shall bear the cost of making good all work of the County or separate contractors destroyed or damaged by such correction or removal.

13.2.8. Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation, which the Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time periods noted in Subparagraph 13.2.2, or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents, relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the Contractor's obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

13.3. ACCEPTANCE OF DEFECTIVE OR NONCONFORMING WORK

13.3.1. If the County prefers to accept defective or nonconforming Work, the County may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 14
TERMINATION OF THE CONTRACT

14.1. TERMINATION BY THE CONTRACTOR

14.1.1. If the Work is stopped for a period of sixty days under an order of any court or other public authority having jurisdiction, or as a result of an act of government such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or a Subcontractor or any agents or employees or any other persons performing any of the Work under a Contract with the Contractor, then the Contractor may, upon thirty additional days' written notice to the County and the Engineer, terminate the Contract and recover from the County payment for all work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery.

14.2. TERMINATION BY THE COUNTY

14.2.1. Termination by the County for Cause
If the Contractor is adjudged bankrupt, or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of the Contractor's insolvency, or stop notices are served upon the County, or if the Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or fails to make prompt payment to Subcontractors for materials or labor, or the Contractor or a subcontractor persistently
disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or persistently disregards instructions of the Construction Manager, Engineer or County, or otherwise is guilty or a subcontractor is guilty of a substantial violation of a provision of the Contract Documents, or the Contractor fails to provide and keep in full force and effect all insurance required by Article 11, or fails to cause all subcontractors to so comply, and fails after written notice to commence and continue correction of such default, neglect or violation with diligence and promptness, the County upon certification by the Construction Manager that sufficient cause exists to justify such action, may, after an additional written notice and without prejudice to any other remedy the County may have, terminate the Contract.

Procedure for Termination for Cause.

Unless within seven (7) days of the delivery of such notice, the Contractor shall cease such violation and make satisfactory arrangements for a correction thereof, which arrangements are set forth in a written agreement signed by the Contractor and the Construction Manager, the Contractor’s right to complete the Work shall cease and terminate.

In the event of any such termination, the County shall, immediately give written notice thereof to the surety and to the Contractor and the surety shall have the rights and obligations set forth in the performance bond. If the County is forced to take over the Work, it may prosecute the same to completion by Contract or by any other method it may deem advisable, for the account and at the expense of the Contractor, and the Contractor and its sureties shall be liable to the County for any excess costs, including management, supervision, and design support, occasioned thereby. In such event, the County may, without liability take possession of and utilize in completing the Work, the Contractor’s materials, equipment, tools, construction equipment and machinery whether stored at the Site or elsewhere, thereon owned by the Contractor and may finish the Work by whatever methods the County may deem expedient. Whenever the Contractor’s right to proceed is terminated, the Contractor shall not be entitled to receive any further payment until the Work is finished.

14.2.2. If the unpaid balance of the Contract Sum exceeds all direct and indirect costs of finishing the Work, including compensation for the Construction Manager’s additional services made necessary thereby, Contractor will only be paid for its actual unpaid costs from such excess. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the County. The amount to be paid to the Contractor or the County, as the case may be, shall be certified by the Construction Manager, upon application, in the manner provided in Paragraph 9.4 and this obligation for payment shall survive the termination of the Contract.

14.2.3. Suspension of Performance: Independent of any right to terminate this Agreement, the authorized representative of County for which CONTRACTOR’s services are to be performed, may immediately suspend performance by CONTRACTOR, in whole or in part, in response to health, safety or financial emergency, or a failure or refusal by CONTRACTOR to comply with the provisions of this Agreement, until such time as the cause for suspension is resolved, or a notice of termination becomes effective.

County will have the right to terminate this Agreement without cause by giving thirty (30) days prior written notice of intention to terminate pursuant to this provision, specifying the date of termination. County will pay to the CONTRACTOR the compensation earned for conforming, non-defective, work performed and not previously paid for to the date of termination. County will not pay CONTRACTOR for lost anticipated profits or other economic loss. The payment of such compensation is
subject to the restrictions on payment of compensation otherwise provided in this
Agreement, and is conditioned upon receipt from CONTRACTOR of any and all plans, specifications, records, photographs, logs, and estimates, and other documents pertaining to the Project.
No sanctions will be imposed.

In connection with any termination for convenience, Contractor shall allow County, Construction Manager or any authorized representative(s) to inspect, audit, or reproduce any records to the extent necessary for County or Construction Manager to evaluate and verify the costs incurred by Contractor in performing the Work, including direct and indirect costs such as overhead allocations. Contractor will make this material available upon 48-hours’ written notice from County or Construction Manager. County and Construction Manager may inspect and copy, from time to time and at reasonable times and places, any and all information, materials and data of every kind and character (hard copy, as well as computer readable data if it exists), including without limitation, books, papers, documents, subscriptions, recordings, estimates, price quotations, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers, monthly, quarterly, yearly or other financial statements, and any and all other information or documentation that may, in the judgment of County or Construction Manager, have any bearing on or pertain to any matters, rights, duties, or obligations under or covered by the Contract Documents. Such records shall include but not be limited to, the following: accounting records, payroll records, job cost reports, job cost history, margin analysis, written policies and procedures, subcontract files (contracts, correspondence, change order files, including documentation covering negotiated settlements), backcharge logs and supporting documentation, general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends, and any other documents customarily maintained by contractors performing work on public works projects or that County or Construction Manager otherwise deem necessary to substantiate charges related to a Termination.

If this Contract is terminated for default under Article 14 and if it is later determined that the default was wrongful, such default termination automatically shall be converted to and treated as a termination for convenience under this Section. In such event, Contractor shall be entitled to receive only the amounts payable under this Section, and Contractor specifically waives any claim for any other amounts or damages, including any claim for consequential damages or lost profits.

ARTICLE 15
ADDITIONAL INSTRUCTIONS

15.1 SUBSTITUTION OF MATERIALS

When a specific manufacturer, trade name or material is specified or indicated, it is to establish a standard of quality and shall not be construed as limiting competition. Materials, products, processes, or articles indicated are specified by the name brand of the manufacturer or by patent or proprietary names, shall be deemed to be followed by the words “or equal”. If the Contractor desires to use material other than that specified he or she shall request approval of such substitution, in writing to the County’s Representative. Requests for substitutions shall be in the hands of the County’s Representative no later than fourteen (14) calendar days prior to the date in which addenda will be issued for pre-bid
requests per section 00100 Instructions to bidders. Materials found acceptable will be approved by a duly authorized Addendum. Also per section 00100, if a bidder submits non-approved material substitutions, Itemized Breakdown: The Contractor shall submit a financial breakdown of the work, itemized by crafts or sections as designated by the Construction Manager. The Contractor's payment shall be based upon the monthly percentage of completion of these items.

**Lien Waivers:** The County or Construction Manager may require the Contractor to submit, along with the progress payment request, notarized lien waivers from each subcontractor, materials or equipment supplier. Lien waivers shall comply with Chapter 3 of Division 4 of Part 6 of the Civil Code, starting with section 8210. The aggregate sum of which shall reflect previous progress payments.

15.1.1 It assumes the risk that said substitution may not be approved. Approval of non-approved material substitutions will be made post-bid through the due diligence process. For post-bid substitutions requests, data substantiating the request may be submitted up to 35 days following the Notice of Award. Materials found acceptable will be approved by duly authorized Change Order. It is the intent of this article to comply with Public Contracts Code Section 3400.

If the Contractor desires to use material other than that specified, he or she shall request approval of such substitution, in writing, to the Construction Manager. Such application constitutes a certification that the Contractor:

- **A.** Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
- **B.** Will provide the same warranty for equal as for specified product.
- **C.** Will coordinate installation and make other changes which may be required for work to be complete in all respects.
- **D.** Waives claims for additional costs which may subsequently become apparent.

The Engineer then will determine whether or not the proposed material is equal in quality and utility to the material specified, and its decision shall be final.

Requests for equal materials will only be considered when offered by the Contractor as required by this article.

Requests for substitutions shall be in the hands of the Construction Manager no later than seven (7) calendar days prior to the date on which a decision is needed. Data substantiating the request may be submitted up to 15 days following the Notice of Award. Materials found acceptable will be approved by a duly authorized Addendum or Change Order.

15.1.2 Submittals for approval of substitute materials shall contain sufficient information, descriptive brochures, drawings, samples or other data as is necessary to provide direct comparison to the specified materials. Each submittal shall be well marked and identified as to types and kind of the items being submitted for approval. It is the sole responsibility of the Contractor to submit complete descriptive and technical information so the Engineer can make proper appraisal. Lack of proper information will be sufficient cause for rejection. Reference to catalogs that the Engineer may or may not have will not be acceptable.
15.1.3 The Engineer’s review for approval is for quality of visual appearance. It is the Contractor’s responsibility to confirm and correlate all quantities and dimensions and coordinate with all trades whose work may be affected by the requested substitution.

15.1.4 **Substitutions.**

Unless otherwise provided in the technical specifications, the Contractor may make proposals for substitutions to materials and/or processes shown or specified only under one or more of the following conditions:

1. **Unavailability:** If the specified product or an equal is no longer available in the marketplace.

2. **Delay:** If obtaining the specified product or an equal will delay completion of the Work through no fault of the Contractor.

3. **Better material system or process:** If a better material system or process is available at no additional cost.

4. **Savings:** If a material which meets all of the performance requirements of the specified material is available at a savings to the County.

A proposal for substitution shall include all information required by the Engineer to evaluate the substitute material or process. All substitutions shall be submitted for approval. Such proposal constitutes a certification that the Contractor:

5. Has investigated the proposed product and determined that it meets or exceeds the performance requirements of the specified product.

6. Will provide the same or better warranty for substitution as for specified product.

7. Will coordinate installation and make other changes, including work of other Contractors, which may be required for the work to be complete in all respects at no additional cost to the County.

**Effect of Approval of Substitution.**

If the substitution is approved, the Contractor shall be solely and directly responsible for setting approved substituted materials and/or equipment into the available space, and for the proper operation of the substituted equipment with all other equipment with which it may be associated, all in a manner acceptable to the County.

No time extensions shall be granted on account of a substitution. The Contract Sum shall be adjusted by the price difference between the approved substitution and the originally specified item.

**Time for Proposing Substitution; Decision.**

Substitution proposals will not be considered prior to bidding. All requests for substitutions shall be made within the same time requirement for initial submittals. Failure to timely submit a substitution request shall constitute a waiver by the Contractor and an acceptance of the specified materials. Late submittals may be considered only when the Construction Manager consents in writing, and the County’s best interests so require.

The Construction Manager and the Engineer shall evaluate a timely substitution request, and shall approve, deny, approve with conditions, or initiate the procedure for a
change order in response to the Contractor’s request. This decision shall be final. If the proposed substitution is rejected, the Contractor shall provide the material originally specified. No time extensions will be granted in connection with substitution requests.

Failure by the Contractor to identify all deviations from the Contract Documents in its request for substitution shall render any County action taken thereon null and void. The Contractor shall bear all costs resulting from any error in the request for substitution. Only one request for substitution will be considered for each product. When substitution is not accepted, specified product shall be provided.

Samples and Testing of Proposed Substitutions; Costs of Adapting to Work. When the Construction Manager or Engineer determines that samples and testing are required to evaluate a request for a substitution, the Construction Manager shall so advise the Contractor, and specify the materials or work to be sampled. The Contractor shall, at no cost to the County, provide samples as required by Article 7 dealing with samples and testing, or the Technical Specifications.

The Contractor shall bear all costs of sampling and testing required to decide a request for substitution, and if a substitution is accepted, the Contractor shall bear all costs associated therewith, including the cost of the Construction Manager’s, Engineer’s and/or Engineer’s services required to adapt the substitution to the design to the complete satisfaction of the County, and all costs of mechanical, electrical, structural, or other changes needed to adapt the substitution to the Work.

15.2 **REFERENCE TO STANDARDS**

15.2.1 Reference to known standards shall mean and intend the latest edition or amendment, in effect on the date of the Bid, unless specifically indicated otherwise, and to such portions of it that relate and apply directly to the material or installation called for in the project.

15.2.2 Where material is specified solely by reference to standard specifications, the Contractor shall, if requested by the Construction Manager, submit to the Construction Manager for his or her approval, data on all such material proposed to be incorporated into the Work of the Contractor listing the name and address of the vendor, the manufacturer or producer, and the trade or brand names of such materials.

The standard referred to, except as modified in the specifications, shall have full force and effect as though printed in these specifications. These standards are not furnished to the bidder for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements.

.1 Where Federal Specifications are referred to as a measure of quality and standard, they refer to Federal Specifications established by the Procurement Division of the United States Government and are available from the Superintendent of Documents, U.S. Government Printing Office.

.2 Where Federal Specification numbers are used, they refer to the latest edition including amendments thereto.

.3 Where Commercial Standards (CS) or Product Standards (PS) are referred to as a measure of quality, standard, and method of fabrication, they refer to Commercial Standards and Product Standards issued by the U.S. Department of
.4 Where ASTM serial numbers are used, they refer to the latest tentative specifications, standard specifications, standard method or standard methods of testing, issued by the American Society for Testing Materials, unless specifically noted.

15.3 **SPECIFICATIONS**

15.3.1 The Specifications are organized into Divisions, Sections, and Trade headings based on the Construction Specifications Institute's 48-Division format and the Master format numbering system. This organization shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of the Work to be performed by any trade. The Contractor shall be responsible for examining all sections of the Specifications for inter-related items of the Work, and for furnishing each item identified or specified.

15.3.2 No responsibility will be assumed by the County or the Construction Manager for omissions or duplications by the Contractor in the completion of the Contract due to any alleged error in the arrangement of the material in these Specifications nor shall any such segregation of work and materials operate to make the Construction Manager an arbiter in defining the limits to the agreements between the Contractor and its subcontractors or suppliers.

15.3.3 The misplacement, addition or omission of any letter, word or punctuation mark shall in no way damage the true spirit, intent or meaning of these Specifications.

15.3.4 The words "shown", "indicated", "noted", "scheduled" or words of that effect shall be understood to mean that reference is made to the Drawings accompanying these Specifications.

15.3.5 Where reference herein is made to colors or finishes "as selected", the reference is to the Construction Manager with concurrence by the County.

15.4 **APPROVED APPLICATORS**

15.4.1 Where specific instruction in these Specifications require that a particular product and/or materials be installed and/or applied by an "approved applicator" of the manufacturer, it shall be the Contractor's responsibility to insure that any subcontractors used for such work be approved applicators.

15.5 **DELIVERY AND STORAGE OF MATERIALS**

15.5.1 Deliver all manufactured materials in the original packages, containers or bundles (with the seals intact) bearing the name or identification mark of all manufacturers.

15.5.2 Deliver fabrications in as large assemblies as practicable and where specified to be shop-primed or shop-finished; they shall be packaged or crated as require to preserve such priming or finish intact and free from abrasion.

15.5.3 Store all materials in such manner as necessary to properly protect same from damage, as materials or equipment damage by handling, weather, dirt or from any other cause will not be acceptable.
15.5.4 Store materials off sidewalks, roadways, and underground services to cause no obstructions. The Contractor shall be responsible for protecting all material and equipment furnished under the Contract.

15.6 **WORKMANSHIP**

15.6.1 Where not more specifically described in any of the various Sections of these Specifications, workmanship shall conform to all of the methods and operations of best standards and accepted practices of the trade or trades involved, and shall include all items of fabrication, construction, or installation regularly furnished or required for completion (including any finish), and for successful operation as intended.

15.6.2 All work shall be executed by mechanics skilled in their respective lines of work.

15.6.3 When completed, all parts shall have been durably and substantially built and shall present a neat, workmanlike appearance.

15.7 **FINAL GUARANTEE**

15.7.1 The Contractor shall be held responsible for, and must make good any defects through faulty, improper, or inferior workmanship or materials, arising or discovered in any part of its work or structure, piping and appurtenances, within three (3) years after the filing of the Notice of Completion. The Performance Bond, furnished by the Contractor, shall cover such defects and protect the County against them.

15.8 **HOURS OF WORK**

15.8.1 Eight (8) hours of labor shall constitute a legal day's work upon all work done hereunder, and it is expressly stipulated that no worker employed at any time by the Contractor, or by a subcontractor under this Contract, upon the work, shall be required or permitted to work thereon more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week, except as provided in Section 1810-1815 inclusive, of the Labor Code of the State of California, all the provisions whereof are deemed to be incorporated herein as if fully set out; and it is further expressly stipulated that for each and every violation of said last named stipulation, said Contractor shall forfeit, as a penalty to the County, twenty-five dollars ($25.00) for each worker employed by the Contractor in the execution of this Contract, for each calendar day during which said worker is required or permitted to labor more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week in violation of the provisions of said section of the Labor Code.

15.8.2 The Contractor and each subcontractor shall also keep or cause to be kept, an accurate record showing the names and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the work contemplated by this Agreement, which record shall be open at all reasonable hours to the inspection of the County or its officer or agents, and to the Division of Labor Law Enforcement of the Department of Industrial Relations, its deputies and agents.

15.8.3 Notwithstanding the above stipulations, pursuant to Section 1815 of the Labor Code, work performed by employees of contractors in excess of eight (8) hours per day and forty (40) hours during any one week shall be permitted upon the project upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1 1/2) times the basic rate of pay.
15.8.4 Whenever the Contractor arranges to work at night or any time when work is conducted other than the normal 40-hour week, or to vary the period during which work is carried out each day, it shall give the Construction Manager a minimum of 48-hours notice so that inspection may be provided. Additional inspection costs incurred because of overtime or shift work shall be paid by the County. If this overtime work is necessitated by the Contractor’s error or failure to perform, the cost of inspection will be borne by the Contractor.

15.9 WAGE RATES

15.9.1 Pursuant to Section 1770-1780 of the Labor Code of the State of California, the Department of Industrial Relations has determined the general prevailing rate of per diem wages and rates for legal holidays and overtime in the locality in which this work is to be performed, for each craft or type of worker or mechanic needed to execute this Contract. Said wage rates pursuant to Section 1773.2 of the Labor Code are on file with the Clerk of the Board of Supervisors, Administration Building, County Civic Center, 2800 W. Burrel Avenue, Visalia, CA and will be made available to any interested person upon request. They may also be obtained on the internet at www.dir.ca.gov/DLSR/pwd.html. Those prevailing wage rates hereby are incorporated in this Agreement and made a part hereof.

15.9.2 It shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractor under him to pay not less than the said specified rates to all laborers, worker, and mechanics employed by them in the execution of the Contract, and to pay all laborers, workers and mechanics not less often than once weekly. The Contractor to whom the Contract is awarded shall post a copy of the determination of prevailing wages at the job site. The Contractor shall require all subcontractors to comply with Sections 1770-1780 of the Labor Code of the State of California and shall insert into every subcontract the requirements contained therein. The Contractor shall be responsible for compliance by each subcontractor with Labor Code Section 1776.

15.9.3 It is hereby further agreed that the Contractor shall forfeit to the County, as a penalty, fifty dollars ($50.00) for each laborer, worker, or mechanic employed for each calendar day or portion thereof, who is paid less than the said stipulated rates for any work done under the Contract, by him or by any subcontractor under him. The difference between said stipulated rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than said stipulated rate shall be paid to each worker by the Contractor. The Contractor, and each subcontractor, shall keep or cause to be kept an accurate record showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection with the public work. The records shall be open at all reasonable hours to the inspection of the County, to its officers and agents, and to the Division of Labor Law Enforcement of the State Department of Industrial Relations, its deputies and agents. In addition, the Contractor shall submit a certified copy of the payroll records of the Contractor and each subcontractor to the awarding body within seven (7) days after the payroll week ending date.

15.9.4 In case it becomes necessary for the Contractor or any subcontractor to employ on the work under this Contract any person in a trade or occupation (except executive, supervisory, administrative, clerical or other non-manual workers as such) for which no minimum wage rate is specified, the Contractor shall immediately notify the County
who will promptly, after consultation with the DIR, determine the prevailing rate for such additional trade or occupation from the time of the initial employment of the person affected and during the continuance of such employment. The Contractor and all subcontractors shall pay each worker engaged in the specified work not less than those rates. Pending such determination, the wages may be assumed to be those in the applicable collective bargaining agreement, but no adjustment in the Contract Price shall be made if such assumption is incorrect.

15.9.5 No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code § 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code § 1771.1(a)]. No contractor or subcontractor may be awarded a Contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code § 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

According to sections 1770-1780 of the Labor Code of the State of California, the Director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages in the locality for each craft or type of worker needed to execute the Contract.

The Contractor to whom the Contract is awarded and any subcontractor under it will pay all workers employed on the work at least the rates determined by the Director of the Department of Industrial Relations. Copies of the prevailing rate of per diem wages are on file with the Department of Industrial Relations, Division of Apprenticeship Standards, 455 Golden Gate Avenue 10th Floor, San Francisco, California 94102, and at the principal office of the Owner, and are available to any interested party on request.

According to Labor Code § 1775, the Contractor will, as a penalty to the Owner, forfeit not more than $200.00 for each calendar day or portion of a day, for each worker paid less than the prevailing rates as determined by the director for the work or craft in which the worker is employed. The amount of this penalty will be determined by the California State Labor Commissioner and will be based on the consideration of the Contractor's failure to pay the correct rate as a good faith mistake, penalties assessed against the Contractor within the previous three years for failing to meet its prevailing wage obligations, or the Contractor's willful failure to pay the correct rates of prevailing wages.

According to Public Contract Code § 6109, with respect to subcontractors which are ineligible to perform work on public works projects according to Labor Code § 1777.1 or 1777.7:

1. The Contractor must not allow any such subcontractor to work on this project.
2. The Contractor must repay to the Owner any money paid to any such subcontractor allowed to work on this project.
3. The Contractor will pay the wages of the workers of any such subcontractor allowed to work on this project.

According to Labor Code § 1776, the Contractor and each subcontractor are required to keep or cause to be kept an accurate record showing the names and occupations of all laborers, workers and mechanics employed by it in connection with the execution of this Contract or any subcontracts, and showing also the actual per diem wage paid to each
of such workers, which records will be open at all reasonable hours to inspection by the Owner, its officers and agents and to representatives of the Division of Labor Standards Enforcement of the State Department of Industrial Relations. The certified payroll records are required to be on forms provided by the Division of Labor Standards Enforcement or will contain the same information as the forms provided by the division.

15.10 **APPLICATION OF HIGHEST STANDARDS AND REQUIREMENTS**

15.10.1 Whenever two or more standards or requirements appear in these General Conditions or in any other part of the Contract Documents that form the Contract, the highest standard or requirement shall be applied and followed in the performance under this Contract.

15.11 **NONDISCRIMINATION IN EMPLOYMENT**

15.11.1 Federal and State Laws prohibit discrimination in employment. The California Fair Employment Practices Act (Labor Code § 1410 to 1433) prohibits discrimination in employment on the basis of race, religion, color, sex, physical handicap, medical condition, marital status, age, national origin or ancestry, and applies to all employers, employment agencies and labor organizations.

15.11.2 Title VII of the Federal 1964 Civil Rights Act (42 U.S.C. § 2000e - 2000e - 17) prohibits employment discrimination on the basis of race, color, sex, religion, or national origin, and applies to all employers that employ at least 15 workers during each working day in each of 20 or more calendar weeks in the current or preceding year.

15.11.3 In addition to these two laws of general application, there are other Federal and State laws that prohibit employment discrimination in particular cases.

15.11.4 The County of Tulare is an Affirmative Action Employer and expects all of its contractors and suppliers to familiarize themselves with, and comply with, all applicable laws relating to employment discrimination.

15.11.5 To the extent required by law, the Contractor shall meet all requirements of law relating to the participation of minority, women, and disabled veteran business enterprise contracting goals, and shall comply with Public Contract Code § 10115 et seq. and all applicable regulations. Contractor further agrees that, when required, Contractor will ensure compliance by all subcontractors and will complete all forms required by all agencies exercising jurisdiction over the project.

15.12 **APPRENTICES**

15.12.1 Pursuant to Sections 1770-1780 of the Labor Code of the State of California, the Department of Industrial Relations has determined the general prevailing rate of per diem wages in the locality for each craft or type of worker needed to execute the Work. Said wage rates pursuant to § 1773.2 of the Labor Code are on file with the Clerk of the Board of Supervisors, Administration Building, County Civic Center, Visalia, California, and will be made available to any interested person on request.

15.12.2 Pursuant to Section 1775 of the Labor Code of the State of California, nothing in this chapter shall prevent the employment of properly registered apprentices upon public works.

15.12.3 Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed
only at the work of the craft or trade to which he or she is registered.

15.12.4 Only apprentices, as defined in § 3077, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4 (commencing at Section 3070), Division 3, of the Labor Code, are eligible to be employed on public works. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he or she is training.

15.13 PROVISIONS REQUIRED BY LAW DEEMED INSERTED

15.13.1 Every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted, and this Contract shall be read and enforced as though it were included, and if through mistake or otherwise any provision is not inserted or is not correctly inserted, upon application of either party the Contract shall be amended to make the insertion or correction.

15.13.2 Conflict of Interest.
No official of the County who is authorized on behalf of the County to negotiate, make, accept, or approve, any consulting, inspection, construction, or materials supply Contract, or any subcontract in connection with the construction of the Project, or any land acquisition in connection with the Project, shall become directly or indirectly interested personally in this Contract or in any part thereof.

No officer, employee, attorney, Engineer, or inspector of or for the County who is authorized on behalf of the County to exercise any executive, supervisory, or other similar function in connection with the construction of the Project shall become directly or indirectly interested personally in this Contract or any part thereof.

15.13.3 No Verbal Agreements.
No verbal agreement or conversation with any officer, agent, or employee of the County, either before, during, or after the execution of the Contract Documents shall affect or modify any term or condition contained in the Contract Documents, nor shall such verbal agreement or conversation entitle the Contractor to any additional payment or time to perform whatsoever under the terms of this Agreement.

15.13.4 Anti-Trust Assignment.
By execution of the Contract Documents, or any subcontract awarded by the Contractor, the Contractor or any subcontractor offers and agrees to assign and hereby does assign to the County all rights, title, and interest in and to all causes of action the Contractor or subcontractor may have under Section 4 of the Clayton Act (15 USC § 15) or under the Cartwright Act (Chapter 2 of Part 2 of Division 7 of the Business and Professions Code, commencing with § 16700), arising from purchases of goods, services, or materials pursuant to this public works Contract or subcontract. This assignment shall be made and shall become effective upon execution of the Contract.

15.14 Contractor Not Agent, Nor Employee.
Neither the Contractor nor any subcontractor, or any officer, agent, or employee of either, is, nor shall they represent themselves to be, an officer, agent, or employee of the County for any purpose whatsoever.

No person employed by the Contractor, or by any subcontractors, are, nor shall they be construed to be in any manner or for any purpose whatsoever, employees of the County.
ARTICLE 16
GUARANTEE

16.1 Contractor guarantees that all materials and workmanship shall conform to the Contract Documents and agrees to replace, at its sole cost and expense, and in conformity with the Contract Documents, any defective material and any and all work defectively or improperly performed or installed within a period of one (1) year after final acceptance in accordance with paragraph 9.8 of the General Conditions. The Contractor shall, in no case longer than fifteen (15) days after receipt of written notice thereof, commence to repair and/or replace any defect in materials or workmanship which may develop during said 1-year period, and any damage to adjacent materials resulting from the repairing or replacing of such defects, at its own expense and without cost to County. In the event Contractor fails to remedy any such defect within 15 days after receipt of such written notice (unless Contractor has commenced the repair and is diligently pursuing the repair to completion), County may proceed to have such defects remedied at Contractor’s expense and Contractor shall pay the costs and charges incurred thereby. Emergency repairs, including but not limited to power, water, sewer, fire and life safety, shall have a 48-hour response time. The cost and repair of any supplementary damage caused by construction defects will be the sole responsibility of the Contractor. Neither acceptance nor payment nor any provision in these documents shall be deemed to be a waiver by County to relieve Contractor of any responsibility under this Contract. The Contractor shall submit a written guarantee on the form that follows.
GUARANTEE

Guarantee for County of Tulare. We hereby guarantee that the Water System Improvements for Yettem and Seville (Phase 1), which we have constructed in Visalia, California, has been constructed in accordance with the drawings and specifications, and that the work as installed will fulfill the requirements included in the specifications. The undersigned agrees to repair or replace any or all such work, together with any other adjacent work which may be damaged in connection with such construction, that may prove to be defective in workmanship or material within a period of one calendar year by the County of Tulare, ordinary wear and tear and unusual abuse or neglect expected.

In the event of the undersigned’s failure to comply with the above-mentioned conditions within a reasonable period of time, as determined by the County, but not later than ten (10) days after being notified in writing by the County, the undersigned authorizes the County to proceed to have said defects repaired and made good at the expense of the undersigned, which will pay the costs and charges therefore upon demand.

Countersigned

(Proper name)  (Proper name)
Date of signature: ________________  Date of signature: ________________

(Printed name)  (Printed name)
By: ____________________________  By: ____________________________

(Signature of Subcontractor or General Contractor)  (Signature of General Contractor if for Subcontractor)

Representatives to be contacted for services;

Name: ____________________________

Address: ____________________________

Telephone Number: ____________________________
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END OF SECTION 000700
Contractor must procure all permits, licenses, contracts and other services needed to prosecute the work. You must pay for all permits, licenses, contracts and other services. Payment is included in the contract price and no additional compensation will be allowed.

Submit a traffic control plan for acceptance by the Engineer. The traffic control plan shall depict the traffic control devices to be used and their location and shall be prepared by a licensed Traffic Engineer or Civil Engineer. Payment for the traffic control plan is included in the traffic control system.

You are required to pay for the cost of furnishing all flaggers, including transporting flaggers and furnishing stands and towers for flaggers to provide for the passage of traffic through the work as specified in Caltrans Standard Specifications Sections 7-1.03 and 7-1.04.

You must comply with all applicable requirements and provisions of the environmental document(s) and the permits obtained for this project.

A delay to the controlling operation due to environmental requirements will be considered a temporary suspension of work under Caltrans Standard Specifications Section 8-1.06. No contract adjustment or additional compensation will be made for delays caused by environmental requirements. The days on which the suspension is in effect shall not be considered working days as defined in Caltrans Standard Specifications Section 8-1.06B.

You must comply with Article 10 of the Tulare County Ordinance Code Chapter 3, Part IV, “Recycling and Diversion of Construction and Demolition Debris,” which requires you to recycle 100% of inert solids (asphalt, concrete, rock, stone, brick, sand, soil and fines) and 50% by weight of the remaining construction and demolition material generated by the work. Submit the required Pre-Plan portion of the Construction and Demolition Waste Recycling and Reuse Plan after the award of the contract to the Engineer with the contract documents identifying the material type, hauler, disposal location and the percentage of material to be reused or recycled. There is no filing fees required for this submission of this plan. A copy of the Ordinance, the form for the Construction and Demolition Waste Recycling and Reuse Plan and other information may be found at:

http://www.co.tulare.ca.us/government/solid_waste/construction_n_demolition/default.asp

Submit to the Engineer the required Final Report of the Construction and Demolition Waste Recycling and Reuse Plan prior to the Engineer’s acceptance of the work.

Full compensation for all labor, tools, equipment and reporting requirements required for compliance with the Recycling and Diversion of Construction and Demolition Debris Ordinance shall be considered as included in the items of work generating this debris and no additional compensation will be allowed therefor.
When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and you encounter materials you reasonably believe to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, you may continue work in unaffected areas reasonably believed to be safe. You must immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and you will be compensated for the delay in conformance with the provisions in Caltrans Standard Specifications Section 8-1.07. Comply with the requirements of the permits acquired by the County for this project located elsewhere in these special provisions.

You must comply with all applicable San Joaquin Valley Unified Air Pollution Control District (SJ VAPCD) regulations and requirements.

The Contractor shall obtain any permits, if required, from the San Joaquin Valley Air Pollution Control District (SJ VAPCD) and comply with all conditions imposed by said permits.

The Contractor shall not be allowed to begin work until copies of the approved permits and conditions have been provided to the Engineer or documentation from the San Joaquin Valley Air Pollution Control District is provided stating that permits will not be required for the Contractor's equipment and operations.

Contractor shall comply with all San Joaquin Valley Air Pollution Control District (SJ VAPCD) rules and regulations including but not limited to, adherence to SJ VAPCD Rule 9510 (Indirect Source Review, or ISR) and Regulation VIII (Fugitive PM10 Prohibition), including requirements for Dust Control Permits. County will submit and pay initial application fees to the SJ VAPCD for the Air Impact Assessment (AIA) application pursuant to ISR and the Dust Control Plan application pursuant to Regulation VIII requirements.

Contractor shall be responsible for providing the SJ VAPCD with the information necessary to complete and obtain approval of the submitted Dust Control Plan. Should Contractor wish to revise the control measures identified in the Dust Control Plan, the Contractor shall be responsible for amending the Dust Control Plan with the SJ VAPCD, and shall provide the County with a copy of the amended Dust Control Plan. Contractor shall be responsible for any and all additional fees that may be incurred from such amendments and/or failure to comply with the approved Dust Control Plan.
Pursuant to the AIA application, Contractor must use a fleet capable of achieving the emissions reduction requirements identified in Section 6.1.1 of SJVAPCD Rule 9510, and shall keep daily records of the total hours of operation for each piece of equipment greater than 50-horsepower being used on the project site during construction activities. Within 30-days of completing construction, Contractor shall submit a Detailed Fleet Report summarizing total hours of operation by equipment type, equipment model year and horsepower for each piece of construction equipment greater than 50-horsepower to the SJVAPCD. Contractor shall be responsible for all additional fees or fines that may be incurred upon the final review of the final Clean Fleet Report submitted to the SJVAPCD pursuant to the clean Construction - Detailed Fleet Mitigation included in the AIA application.

Additional information can be found at the links below:
Current SJVAPCD Rules and Regulations:

Dust Control (forms, applications, information):
http://www.valleyair.org/busind/comply/PM10/compliance_PM10.htm

Indirect Source Review (forms, applications, information):
http://www.valleyair.org/ISR/ISRHome.htm

Detailed Fleet reporting template (can be used for compliance with clean fleet reporting requirement):
http://www.valleyair.org/ISR/ISRFormsAndApplications.htm

Sacramento Metropolitan AQMD Construction Mitigation Calculator (provides emissions and reductions based on fleet):
http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation (click on link to “Construction mitigation calculator”)

Excavation, transportation, and handling of material containing hazardous waste or contamination must result in no visible dust migration. Have a water truck or tank on the job site at all times while clearing and grubbing and performing earthwork operations in work areas containing hazardous waste or contamination.

The Contractor shall conduct his operations in full compliance with the requirements of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and obtain and comply with any or all permits required by the SJVUAPCD.

Full compensation for dust control including the cost of any permits and water shall be considered as included in the price paid for the various items of work requiring dust control and no additional compensation will be allowed therefore.

If applicable, obtain a Demolition Permit Release from SJVAPCD. Nothing herein or elsewhere within these special provisions shall be construed as limiting your responsibility for complying with all applicable rules and regulations. You are responsible for payment of all the fees required to obtain the Demolition Permit Release.
For projects that will result in land disturbance of greater than one acre file the Notice of Intent and pay the appropriate fee as required by the terms of General Permit No. CSA000002, for the discharge of storm water associated with construction activity.

Payment for conforming to the requirements in these permits shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

END OF SECTION 003146
SECTION 01 00 05
SPECIFICATIONS

PART 1 GENERAL

1.1 GENERAL

A. The Contractor shall keep on the job a copy of the Plans and Specifications and shall at all times give the Owner and Engineer access thereto.

B. Anything mentioned in the Specifications and not shown on the Plans or shown on the Plans and not mentioned in the Specifications shall be of like effect as if shown or mentioned in both.

C. The Contractor shall not take advantage of any errors, discrepancies or omissions which may exist in the Plans and Specifications but shall immediately call them to the attention of the Engineer whose interpretation or correction thereof shall be conclusive.

D. In case of conflict between portions of the Contract Documents, the order of precedence of Contract Documents shall be:

   First: Permits from other agencies as may be required by law.
   Second: Addenda
   Third: Bid Documents, Division 0
   Fourth: Technical Specifications, Division 2 through Division 43
   Fifth: Plans
   Sixth: General Requirements, Division 1
   Seventh: State Standard Specifications
   Eighth: Reference Documents

E. Change Orders, supplemental agreements and approved revisions to Plans and Specifications will take precedence over documents listed above. Detailed Plans shall have precedence over general Plans.

F. Whenever any conflict appears in any portions of the Contract Documents, it shall be resolved by application of the order of precedence.

1.2 GENERAL REQUIREMENTS AND TECHNICAL SPECIFICATIONS

A. For definitions of the Specifications categorized as General Requirements (Division 1) and Technical Specifications (Division 2 through Division 43) refer to Section 01 42 13 – Definitions and Abbreviations.

1.3 REFERENCE DOCUMENTS

A. For a definition of Reference Documents and State Standard Specifications refer to Section 01 42 13 – Definitions and Abbreviations.
B. Throughout the following Specification sections, references are made to various widely published, standard and commercial specifications, manuals, or codes of technical societies, organizations, or associations. These specifications are intended to amplify the descriptions of materials, equipment, and construction systems. The Contractor shall caution each of his Subcontractors to become familiar with the contents of the pertinent portions of these Reference Documents. The following Reference Documents are the most widely used, and are cited or referred to in each of the following sections of these Specifications:

1. American Society of Testing Materials (ASTM)
2. American National Standards Institute (ANSI)
3. American Standards Associations (ASA)
4. American Concrete Institute (ACI)
5. Federal Specifications, as applicable.
6. California Building Code
7. California Plumbing Code

C. Each citation of a Reference Document shall be construed to refer to the latest published revision of such specification as of the date of the invitation for bids and to such portions of it that relate and apply directly to the material or installation called for on this job. The Engineer will give no consideration to any claimed ignorance as to what a cited Reference Document contains, since such Subcontractor on a project of this scope is deemed to be experienced and familiar with his own trade to be experienced and familiar with his own trade's generally accepted, published standards of quality.

D. Whenever references are made to any of the above-mentioned Reference Documents or testing methods in the governing Building Codes, the requirements of those Reference Documents shall govern, insofar as they are not in contravention with maxima or minima prescribed by documents designated in the Building Code.
1.4 **LIST OF DRAWINGS**

1. See Sheet G00-02 of the Plans.

1.5 **STATE STANDARD SPECIFICATIONS**

A. For the purpose of this contract, the following terms or pronouns in place of them, used throughout the State Standard Specifications and defined in Section 1, Definition of Terms, of the State Standard Specifications, shall be as follows:

<table>
<thead>
<tr>
<th>TERMS</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>State of California</td>
</tr>
<tr>
<td>Department</td>
<td>Tulare County</td>
</tr>
<tr>
<td>Director</td>
<td>Tulare County or Project Engineer</td>
</tr>
<tr>
<td>Engineer</td>
<td>Tulare County or Project Engineer</td>
</tr>
<tr>
<td>Department of Transportation</td>
<td>California Department of Transportation</td>
</tr>
<tr>
<td>Contractor</td>
<td>The person or persons, co-partnership or corporation, private or municipal, who have entered into a contract with the Tulare County as party or parties of the second part, or his or her legal representative.</td>
</tr>
</tbody>
</table>

1.6 **OCCUPATIONAL SAFETY AND HEALTH ACT**

A. The applicable standards of the American National Standards Institute and the National Fire Protection Association that have been adopted are hereby made a part of these Specifications as a whole and as mentioned in the various sections.

B. Any errors, ambiguities, or inconsistencies of these standards with either the local codes, the Specifications, or the Drawings shall be brought to the attention of the Engineer.

1.7 **COMPLIANCE WITH ALL LAWS AND CODES**

A. Contractor shall conform to and abide by all local city, county, state and federal laws, rules, regulations, including industrial safety laws. Such laws shall be considered as essential parts of these Specifications and, in the absence of definite requirements herein, the provisions of such rules and regulations shall be observed by the Contractor. If the Drawings and/or Specifications are at variance therewith, Contractor shall so notify Engineer promptly. Should the Contractor
perform any work contrary to such laws, ordinances, rules and regulations he shall bear all costs arising therefrom.

B. Where these Specifications, however, call for or describe materials workmanship or construction of a better quality, higher standard, or larger size than is required by said rules and regulations, the provisions of these Specifications shall take precedence over said rules and regulations. Contractor shall furnish, without any extra charge, all additional labor or materials, or both, when required for compliance with these rules and regulations.

END OF SECTION
SECTION 01 11 00
DESCRIPTION OF WORK AND SCHEDULE CONSTRAINTS

PART 1 GENERAL

1.1 WORK INCLUDED
A. The work consists of furnishing all labor, materials and equipment necessary to construct a new water distribution system in Seville, California, accordance with the Plans and the Specifications.

B. The primary components of work includes, but is not limited to, the following:
   1. Potholing and locating existing facilities
   2. Constructing new water mains, services and meters, fire hydrants, and appurtenances. The work includes water main crossings of the Sontag Ditch, which is owned and operated by Alta Irrigation District, trench resurfacings, and connecting the existing Seville well pump station to the new water system.
   3. Abandoning the old water distribution system.

C. Construction of a new storage tank site has been incorporated into the construction documents as add alternate bid items. If awarded by the Owner, add alternate work for one of the following will be included in the contract:
   1. Add Alternate No. 1 – Clearing and grubbing, site grading, and perimeter fence installation around the Seville storage tank site.
   2. Add Alternate No. 2 – This add alternate includes the work described in Add Alternate No. 1 and furnishing a standby portable generator at the Seville storage tank site.
   3. Add Alternate No. 3 – This add alternate includes the work described in Add Alternate No. 2 and full development of the Seville storage tank site, including but not limited to: site piping; electrical, control and lighting; 211,000-gallon storage tank; booster pump station; hydro-pneumatic tank; chlorination equipment; and finish grading and surfacing.

1.2 BEGINNING OF WORK
A. The Contractor shall begin work within fourteen (14) calendar days after receipt of official Notice to Proceed from the Owner.

1.3 TIME OF COMPLETION
A. The Contractor shall substantially complete all work within one-hundred ninety (190) calendar days unless the period for completion is extended otherwise by the Contract Documents. The work shall be finally complete within an additional thirty
(30) calendar days. The Contractor shall diligently prosecute the work to completion on or before the completion date indicated on the Notice to Proceed.

B. If Add Alternate No. 1 is awarded, no additional days will be allowed to complete the work. If Add Alternate No. 2 or 3 are awarded, the Contractor shall substantially complete all work within two-hundred fifty (250) calendar days unless the period for completion is extended otherwise by the Contract Documents. The work shall be finally complete within an additional thirty (30) calendar days. The Contractor shall diligently prosecute the work to completion on or before the completion date indicated on the Notice to Proceed.

1.4 TIME CONSTRAINTS

A. All excavations and ground disturbing activities shall be completed during the non-rainy season as defined in Section 01 57 19, Environmental Protection Measures.

B. Contractor shall supervise, inspect, and direct the Work competently and apply such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the specific means, methods, techniques, sequence, or procedure of construction required to complete the project as specified by the Contract Documents. Contractor shall be responsible to see that the completed Work complies accurately with the Contract Documents.

1.5 ORDER OF WORK

A. The order of work shall be executed as described below. The Contractor shall submit a work plan and schedule to the Engineer for review and approval prior to the start of construction activities. Any proposed deviations to the execution of work, as described below, are subject to approval by the Owner and Engineer in advance of construction. Construction will be divided into the major phases of work as described below.

B. The Contractor shall complete all work for the distribution system within the time limits specified for the overall contract and the allowable working days within the non-rainy season.

C. Distribution System Improvements

1. The Engineer has made a diligent effort to accurately show existing utilities on the Plans, however, the Contractor is responsible for verifying the location of all existing utilities as a first order of work. The Contractor shall coordinate with the County to locate existing water and sewer facilities. The Contractor is responsible for locating existing sewer laterals to ensure that adequate separation is provided between existing sewer laterals and new water services.

2. New water services:

   a. The Engineer has shown the location of proposed water services based on information provided by the County and Self-Help Enterprises (SHE). SHE will be responsible for installing onsite water
pipes to transfer water service connections from existing backyard mains to the new front-yard water service lateral and meter.

b. Any new water services identified that are not shown on the Plans shall be added to the water service list. Addition of any new water services are subject to approval by the County and Engineer. Additional water services shall be paid at the unit price bid amount.

c. The Contractor is responsible for conducting a door-to-door survey and contacting property owners to confirm the front-yard location of new water services prior to installing water services. The Contractor shall be accompanied by the County's representative and SHE during the survey. Any changes to water service locations shown on the plans shall be documented by the Contractor and approved by the County's representative. The final service locations shall be shown by the Contractor on the final record drawings.

d. The Engineer will provide one initial set of construction stakes for water services at the proposed location shown on the Plans. The Contractor is responsible for marking new service locations for any services that change in location as a result of the property owner survey.

3. The Contractor shall construct water mains, water services and meters, fire hydrants, blow-offs, air valve assemblies, bacteriological monitoring stations, and all appurtenances as shown on the plans and specifications. Reference is made to General Conditions, and Supplementary Conditions for specific Permit and License requirements as described below.

a. A County of Tulare Encroachment Permit is not required. However, the Contractor shall comply with construction requirements within County right of way, including traffic control, dust control, temporary and permanent trench resurfacing. No open trenches will be allowed overnight or on the weekends without special advance approval by the County. The Contractor shall backfill trenches and place temporary trench resurfacing in conformance with the plans, and these Specifications. Use of trench plates in lieu of backfill and temporary resurfacing shall be subject to approval by the County.

b. The Contractor will be responsible for obtaining an Encroachment Permit from Caltrans for any work encroaching in Caltrans right-of-way, such as installing traffic control signage.

c. Reference is made to the Alta Irrigation District (AID) requirements shown on the Plans. The Contractor shall notify the District prior to work in AID right of way or crossing AID culverts or ditches.

4. The Contractor shall furnish and install meters, as specified in the Plans and Specifications (see Appendix for meter type). The Contractor shall record serial numbers of meters installed at each address and shall furnish...
County of Tulare  
Water System Improvements for Yettem & Seville

a list to the Owner for use to develop a billing list. A sample meter form is included in the Appendix.

5. Water shall be obtained as specified in Section 01 51 36, Watering.

6. Disinfect and test water system improvements in conformance with the requirements of these Specifications. The water system improvements must be accepted in writing by the Owner after successful completion of testing. No connections shall be made to the existing water system (or existing customer hookups) until the improvements have been accepted.

7. Connect to the existing Seville well pump station (see Sheet C30-01 of the Plans).

8. The next phase of work shall not begin until the work detailed above is complete and accepted by Owner.

D. Water Service Connections

1. SHE will install onsite water pipes to transfer water service from backyard to front-yard to connect to the new water system. The County will coordinate the schedule of this work with the Contractor’s schedule for completion of the water system improvements. SHE will make connections to the new meters installed by the Contractor after the water system is tested and accepted.

2. Disconnection of the old backyard water service will be the responsibility of SHE. The old backyard water service shall be cut, capped and abandoned in place. The County will coordinate disconnection with SHE and private well destruction with the property owners.

3. The Contractor will be responsible for coordinating schedules with the County and SHE for onsite service connections. The Contractor shall plan for a 30 calendar day period after acceptance of the new distribution system to allow time for SHE to connect all homes to the new water system. After all connections are made, the Contractor will be notified to begin abandonment of the old water system.

4. The next phase of work shall not begin until work described above is complete and accepted by Owner.

E. Water System Abandonment

1. The Contractor shall abandon the existing water system in conformance with the requirements of these Specifications.

F. Add Alternate Work (Seville Water Storage Tank Site)

1. The add alternates include Seville water storage tank site improvements. If add alternates are awarded by the Owner, work shall be completed in parallel with the work for the distribution system improvements.
2. The storage tank improvements do not need to be complete prior to accepting the distribution system, however, the tank site improvements must be accepted and testing completed prior to connecting to the new water system and prior to the overall contract time limits.
SECTION 01 11 05
ENGINEER’S STATUS DURING CONSTRUCTION

PART 1  GENERAL

1.1  OWNER’S REPRESENTATIVE

A. Engineer will be Owner’s representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner’s representative during construction are set forth in these Specifications and will not be changed without written consent of Owner and Engineer.

1.2  VISITS TO SITE

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor’s executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Section 1.5, below. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

C. Review of the Work by the Engineer shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

D. No oral or telephonic agreement or conversation with any officer, agent or employee of the Owner or the Engineer, or with the Engineer, either before or after execution of the Contract, shall affect or modify any of the terms or obligations contained in any of the Contract Documents.

E. The Contractor shall pay the Owner for all overtime review in accordance with existing resolutions or fee schedules of the Owner, unless the charges for such
inspections have been specifically waived in the Contract Documents. Overtime charges will be made for all reviews on Saturdays, Sundays, and State holidays, and hours worked by the reviewer other than those of the normal working day.

### 1.3 AUTHORIZED VARIATIONS IN WORK

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefore as provided within the Contract Documents.

### 1.4 REJECTING DEFECTIVE WORK

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed. Neither this authority nor the Engineer’s good faith judgment to reject or not reject any work shall subject the Engineer to any liability or cause of action by the Contractor, subcontractors, or any other suppliers or persons performing work on the Contract.

### 1.5 LIMITATIONS ON ENGINEER’S AUTHORITY AND RESPONSIBILITIES

A. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor’s failure to perform the Work in accordance with the Contract Documents.

B. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

C. Engineer’s review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered will only be to determine generally that their content complies with the requirements of, and in the case of certificates of
inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

D. The limitations upon authority and responsibility shall also apply to, the Engineer’s field representative, known as the Resident Project Representative, if any, and assistants, if any.

### 1.6 RESIDENT PROJECT REPRESENTATIVE

A. Responsibilities of the Resident Project Representative shall be as set forth in Section 000700 – General Conditions, and as modified in Section 000710 – Supplementary Provisions.
SECTION 01 11 10
COORDINATION OF WORK

PART 1 GENERAL

1.1 RESPONSIBILITY OF CONTRACTOR

A. If any part of the Work depends for proper execution or results upon the work of others, the Contractor shall inspect and promptly report to the Engineer any apparent discrepancies or defects in such work of others that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the work of others as fit and proper except as to defects which may develop in the work of others after execution of the Work by the Contractor.

1.2 WORK INVOLVED WITH EXISTING SYSTEM

A. Existing materials and equipment removed not designated to be salvaged for Owner in the execution of the Work shall become the property of the Contractor and shall be removed from, and disposed of, off the site by the Contractor in an acceptable and lawful manner.

1.3 COORDINATION OF WORK

A. The Contractor shall maintain overall coordination for the execution of the Work. Based on the Construction Schedule prepared in accordance with these Specifications, he shall obtain from each of his subcontractors a similar schedule and shall be responsible for all parties maintaining these schedules or for coordinating required modifications.
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END OF SECTION
SECTION 01 20 00

MEASUREMENT & PAYMENT

PART 1 GENERAL

1.1 MEASUREMENT

A. Unless otherwise specified in the Contract Documents, quantities of work shall be determined from measurements or dimensions in a horizontal plane. All measurements shall be made in accordance with United States Standard Measures and shall be measured on the basis of “in-place” quantities.

B. After the work has been completed, the Engineer will make field measurements of unit price items in order to determine the quantities of the various items as a basis for payment. On all unit price items, the contractor will be paid for the actual amount of the work performed in accordance with the contract documents, as computed from field measurements.

C. Work or quantities not listed in the description of bid items are considered incidental to other construction and will not be measured. Compensation for such incidental work is considered to be included in the various items of work bid.

1.2 INCREASED OR DECREASED QUANTITIES

A. Increases or decreases in quantities shall be governed by the General Conditions.

B. All written requests for adjustment shall be made no later than five working days after notification by the Engineer that the item of work is complete.

1.3 FINAL PAY QUANTITIES

A. Final pay quantities shall be in accordance with the General Conditions except as modified below.

B. Final pay quantities will be designated only in the Bid Schedule and in Section 000310 – Bid Form (Explanation of Bid Items), and are not shown on the Plans.

C. When an item of work is designated as a Final Pay Quantity on the Bid Schedule and/or in the Explanation of Bid Items, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated.

If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions.
If a final pay item is eliminated, the estimated quantity for the item will be eliminated.

If a portion of a final pay item is eliminated, the final pay quantity will be revised in proportion to the bid quantity represented by the eliminated portion of the item of work.

D. The estimated quantity for each item of work designated as a Final Pay Quantity on the Bid Schedule and/or in the Explanation of Bid Items shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity.

E. In case of discrepancy between the quantity shown on the Bid Schedule for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown on the Bid Schedule.

1.4 PARTIAL PAYMENT

A. The local agency shall withhold not less than 5 percent of the contract price until final completion and acceptance of the project.

B. Partial payments for materials on hand shall not exceed one hundred percent (100%) of the value of material delivered on site, properly stored in a secured fenced area subject to, or under the control of, the owner and local agency, and unused. Contractor shall submit copies of invoices of materials to support values. Materials stored shall be installed within 60 days of delivery for payment eligibility.

C. Payment shall not relieve the Contractor from its obligations under the Contract; nor shall such payment be construed as acceptance of any of the Work. Payment shall not be construed as transfer of ownership of any equipment or materials to the Owner. Responsibility of ownership shall remain with the Contractor who shall obligated to protect any fully or partially completed work or structure for which payment has been made; or replace any materials or equipment to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to acceptance of the Work.

1.5 FINAL PAYMENT

A. Notice of Completion will be filed in the normal course of business following the first regular meeting of Tulare County which occurs far enough after Final Completion to allow for agendizing Board of Supervisors approval of the Notice.

B. Final payment will be due thirty-five (35) days after the recording of the Notice of Completion by the Owner.

C. Upon completion of the project the final contract prices shall be revised by change order, if necessary, to reflect the true quantities used at the stated unit price.
thereof as contained in the Bidder’s Proposal hereto attached. Payments on account thereof will be made as set forth in these Specifications.

D. The Contractor shall comply with Section 1026 -- Waiver and Release Submittals.
SECTION 01 31 19
PROJECT MEETINGS

PART 1 GENERAL

1.1 PRECONSTRUCTION CONFERENCE

A. Upon receipt of the Notice to Proceed, or at an earlier time if mutually agreeable, the Owner will arrange a preconstruction conference to be attended by the Contractor, Contractor's superintendent, the Owner, the Engineer or his representative, and representatives of utilities, major subcontractors, County of Fresno and others involved in the execution of the Work.

B. The purpose of this conference shall be to establish a working understanding between the parties and to discuss the Construction Schedule, Critical Path Method format required, shop drawing submittals and processing, applications for payment and their processing, and such other subjects as may be pertinent for the execution of the Work.

1.2 PROGRESS MEETINGS

A. The Engineer shall arrange and conduct progress meetings. These meetings shall be conducted weekly, unless designated otherwise and shall be attended by the Engineer or his representative, Contractor, Contractor’s superintendent and representatives of all subcontractors, utilities, and others, that are active in the execution of the Work. The purpose of these meetings shall be to expedite the work of any subcontractor or other organization that is not up to schedule, resolve conflicts, and in general, coordinate and expedite the execution of the Work.

B. The agenda of progress meetings shall include review of progress and schedule, of payment request, of the latest Construction Schedule update, and of the record documents.

1.3 PROGRESS AND SCHEDULE REVIEW

A. The progress of the Work and the Construction Schedule shall be reviewed to verify:

1. Actual start and finish dates of completed activities since the last progress meeting.

2. Durations and progress of all activities not completed.

3. Reason, time, and cost data for Change Order work that is to be incorporated into the Construction Schedule or payment request form.

4. Payment due to the Contractor based on percentage complete of items in the submitted payment request.
5. Reasons for, and duration of, required revisions in the Construction Schedule.

6. After each monthly update, the Contractor shall submit to the Engineer three (3) prints of the last accepted Construction Schedule, revised in accordance with the monthly review.

1.4 REVIEW OF PAYMENT REQUEST

A. The Contractor shall have his copy of the payment request and all other data required by the Contract Documents completed prior to the progress meeting. The Engineer will process Contractor's payment request after satisfactory review of the schedule update.

PART 2 PRODUCTS
NOT USED

PART 3 EXECUTION
NOT USED

END OF SECTION
SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 WORK INCLUDED

A. The work described in this section includes general requirements and procedures related to the preparation and transmission of submittals to include Shop Drawings, Samples, Manuals, and Record Drawings.

1.2 RELATED WORK

A. Section 000700 - General Conditions

B. Individual equipment specifications

1.3 GENERAL

A. Before submitting a Shop Drawing or Sample, Contractor shall have:

1. Reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

2. Determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

3. Determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

4. Determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

B. Submit each submittal document under separate cover or transmittal. Transmittal shall include the following identification data, as applicable:

1. Contract number

2. Project name and location

3. Submittal number and revision

4. Product identification
5. Applicable contract drawing number, specification section, and paragraph number

6. Stamp Space: Blank space of approximately 2-1/2 inches high by 4 inches wide adjacent to the identification data to receive Engineer's status stamp.

7. Contractor's certification statement as described below

C. To each submittal affix the following signed Certification Statement.

1. "Certification Statement: By this submittal, we hereby represent that we have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and pertinent data and we have checked and coordinated each item with other applicable approved drawings and all Contract requirements."

D. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

E. Furnish neat, legible, and sufficiently explicit detail to enable proper review for Contract compliance.

F. Contractor assumes all risks of error and omission.

G. Work performed before approval, or not conforming to approved submittals, shall be at Contractor's risk.

H. Submittal requirements contained in this specification are in addition to specific submittal requirements contained in individual equipment specification sections.

1.4 APPROVAL PROCESS

A. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

B. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

C. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
D. Engineer’s review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has given Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the Contract Documents and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

E. Engineer’s review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

F. Submittals will be returned, marked with one of the following classifications:

1. NO EXCEPTION TAKEN: Requires no corrections, no marks.
2. APPROVED AS NOTED: Requires minor corrections. Items may be fabricated as marked without further resubmission. Resubmit 2 corrected copies to the Engineer.
3. RESUBMIT: Requires corrections. Resubmit entire submittal following original submission with corrections noted. Allow time for checking and Engineer’s appropriate action.
4. REJECTED: Requires major corrections or is otherwise not following Contract Documents. No items shall be fabricated. Resubmit entire submittal following original submission with corrections noted.
5. INFORMATION ONLY: Items specified by Contract Documents.

PART 2 SUBMITTAL DOCUMENTS

2.1 SHOP DRAWINGS

A. Unless otherwise noted in the individual specification sections, submit five (5) sets of shop drawings.

B. All catalog and specification sheets shall be clearly marked to indicate the specific model number and configuration to be used. Items not applicable to the project shall be crossed out.

C. Show complete and detailed fabrication; assembly and installation details; wiring and control diagrams; catalog data; pamphlets; descriptive literature; and performance and test data.

D. Include calculations or other information sufficient to show comprehensive description of structure, equipment, or system provided and its intended manner of use.
E. Include Manufacturer’s installation recommendations.

2.2 SAMPLES

A. Unless otherwise noted in the individual specification sections, submit three (3) samples of each item.

B. Samples shall be representative of the actual material proposed for use in the project and of sufficient size to demonstrate design, color, texture, and finish.

C. Permanently attach to each sample

1. The contract number
2. Project name and location
3. Product identification
4. Applicable contract drawing and specification section number
5. Subcontractor’s, vendor’s and/or manufacturer’s name, address, and telephone number.

D. Certain samples may be tested for specific requirements by the Owner and/or Engineer prior to approval. Failure of sample to pass tests will be sufficient cause for refusal to consider further samples of the same brand and make.

E. Rejected samples will be returned upon request, and resubmittals shall consist of new samples.

2.3 RECORD DRAWINGS

A. Maintain 1 record copy of Contract Documents at site in good order and annotated to show revisions made during construction. Keep annotations current for possible inspection.

1. Make record drawings available to Engineer at all times during life of Contract.

2. Drawings: Made part of record drawings and to include:

   a. Contract Drawings: Annotate or redraft, as required, to show revisions, substitutions, variations, omissions, and discrepancies made or discovered during construction concerning location and depth of utilities, piping, ductbanks, conduits, manholes, pumps, valves, vaults, and other equipment. Make revisions and show on all drawing views with actual dimensions established to permanent points.

   b. Working/Layout Drawings: When required as submittals, record actual layouts of conduit runs between various items of electrical
equipment for power, control, and instrumentation; wire sizes,
numbers, and functions; configuration of conduits; piping layouts;
and duct layouts. Add sections

3. Before preliminary inspection, furnish reproducible of record drawings. At
completion of Contract and before final payment is made, furnish Engineer
1 set of reproducibles of finally approved record drawings reflecting
revisions herein described.

2.4 OPERATION AND MAINTENANCE MANUALS

A. Furnish Operation and Maintenance Manuals for various types of equipment and
systems, as required by Contract Documents. Operation and Maintenance
Manuals shall be provided for all mechanical and electrical equipment. Unless
otherwise indicated, furnish separate manual for each piece of equipment and
system. If manual contains other items or equipment, indicate where specified
items are located in manual. Include in manual complete information necessary to
operate, maintain, and repair specific equipment and system furnished under this
Contract, and include the following specific requirements:

1. Contents.
   a. Table of Contents and Index.
   b. Brief description of equipment/system and principal components.
   c. Starting and stopping procedures, both normal and emergency.
   d. Installation, maintenance, and overhaul instructions including
detailed assembly drawings with parts list and numbers, and
recommended spare parts list with recommended quantity,
manufacturer's price, supplier's address, and telephone number.
   e. Recommended schedule for servicing, including technical data
sheets that indicate weights and types of oil, grease, or other
lubricants recommended for use and their application procedures.
   f. One copy of each component wiring diagram and system wiring
diagram showing wire size and identification.
   g. One approved copy of each submittal with changes made during
construction properly noted, including test certificates, characteristic
curves, factory and field test results.
   h. For electrical systems, include dimensioned installation drawings,
single line diagrams, control diagrams, wiring and connection
diagrams, list of material for contactors, relays and controls, outline
drawings showing relays, meters, controls and indication equipment
mounted on equipment or inside cubicles, control and protective
schematics, and recommended relay settings.
2. Material:
   a. Covers: Oil, moisture, and wear resistant 9 inches by 11-1/2 inches size.
   b. Pages: 60 pound paper 8-1/2 inches by 11 inches size with minimum of 2 punched holes 8-1/2 inches apart reinforced with plastic, cloth, or metal.
   c. Fasteners: Metal screw post or Acco metal strap type.
   d. Diagrams and Illustrations: Attach foldouts, as required.

B. Copies:
   1. Submit five (5) preliminary copies of manuals for review and approval no later than date of shipment of equipment. Installation shall not begin until manuals are accepted by Engineer. Include in preliminary copies all items required under “Contents” above. Three copies will be marked and returned to Contractor.
   2. Deliver seven (7) copies of finally approved manuals to Engineer before startup.

PART 3 EXECUTION

*NOT USED*

END OF SECTION
SECTION 01 35 00
MATERIAL SUBSTITUTION PROCEDURES

PART 1  GENERAL

1.1  GENERAL
A. The materials furnished and used shall be new, except as may be provided elsewhere in these Specifications, or on the Plans.
B. All materials required to complete the work under this contract shall be furnished by the Contractor, unless otherwise stated.
C. It shall be the duty of the Contractor to call the Engineer's attention to apparent errors or omissions and request instruction before proceeding with the Work. The Engineer may, by appropriate instructions, correct said apparent errors and omissions, which instructions shall be as binding upon the Contractor as though contained in the original Contract Documents.

1.2  DEFINITIONS
A. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor.
B. Revisions: Changes to Contract Documents requested by Owner or Engineer.
C. Options: Specified options of products and construction methods included in Contract Documents.

1.3  TRADE NAMES AND ALTERNATIVES
A. Wherever an article, or any class of materials, is specified by the trade name or by the name of any particular patentee, manufacturer or dealer, or by reference to the catalog of any such manufacturer or dealer, it shall be taken as intending to mean and specify the article or material described or any other equal thereto in quality, finish and durability, and equally as serviceable for the purpose for which it is or they are intended. The intent of the Plans and Specifications is to specify highest grade standard equipment, and it is not the intent of these Plans and Specifications to exclude or omit the products of any responsible manufacturer, if such products are equal in every practical respect to those mentioned herein, as determined by the Engineer.

1.4  SAMPLES
A. At the option of the Engineer, the source of supply of materials for the Work shall be subject to tests and inspection before the delivery is started and before such materials are used in the Work. Samples representative of the character and
quality of materials shall be submitted by the Contractor. Samples shall be of sufficient quantities or amounts for testing or examination.

B. All tests of materials furnished by the Contractor shall be made in accordance with the commonly recognized standards of national technical organizations, and such special methods and tests as are prescribed in the Contract Documents.

C. The Contractor shall furnish such samples of materials as are requested by the Engineer, without charge. No material shall be used until the Engineer has had the opportunity to test or examine such materials. Samples will be secured and tested whenever necessary to determine the quality of the material. Samples and test specimens prepared at the jobsite, such as concrete test cylinders, shall be taken or prepared by the Engineer, or his designated representative, in the presence and with the assistance of the Contractor.

1.5 SUBMITTALS

A. Material Submittals shall be made in accordance with Section 01 33 00 – Submittals.

1.6 INSPECTION OF MATERIALS BY THE CONTRACTOR

A. Contractor shall make a close inspection of all materials as delivered, and shall promptly return all defective materials without waiting for their rejection by the Engineer.

1.7 CERTIFICATES OF COMPLIANCE

A. A Certificate of Compliance may be required for certain materials and equipment that become final products of the completed Work. Certificates of Compliance shall be furnished prior to the use of any materials for which these Specifications require that such a certificate be furnished. In addition, when so authorized in these Specifications, the Engineer may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance.

B. The Certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the Specifications.

C. A Certificate of Compliance shall be furnished with each lot of material delivered to the Work and the lot so certified shall be clearly identified in the certificate.

D. All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the Work which conforms to the requirements of the Plans and Specifications and any such material not conforming to such requirements will be subject to rejection whether in place or not.
E. The Owner reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance.

1. The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer.

1.8 MANUFACTURER TESTING

A. At the option of the Engineer, materials and equipment to be supplied under this Contract will be tested and inspected either at their place of origin or at the site of the Work. The Contractor shall give the Engineer written notification well in advance of actual readiness of materials and equipment to be tested and inspected at point of origin.

1. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the materials and equipment nor shall such tests and inspections preclude retesting or re-inspection at the site of the Work.

2. Materials and equipment which will require testing and inspection at the place of origin shall not be shipped prior to such testing and inspection.

1.9 MANUFACTURERS’ RECOMMENDATIONS

A. All equipment specified and used in the project shall be installed in accordance with the approved manufacturer’s current written recommendations.

B. All such equipment, material, etc., shall be of the manufacturer's latest system or line.

1.10 SUBSTITUTIONS

A. Conditions: Contractor's substitutions shall be considered when one or more conditions are satisfied, as determined by the Engineer. (The Contractor's submittal and Engineer’s acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.)

1. Extensive revisions to Contract Documents are not required.

2. Proposed changes are in keeping with the general intent of the Contract Documents.

3. Request is timely, fully documented and properly submitted.

4. Request is directly related to an "or equal" clause or similar language in the Contract Documents.
5. The specified product or method of construction cannot be provided within the Contract Time. The request shall not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

6. The specified product or method of construction cannot receive necessary approval by governing authority, and the requested substitution can.

7. Substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear.
   a. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
   b. Contractor shall provide all data in support of any proposed substitute or “or-equal” at Contractor’s expense.

8. Specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

9. Specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

10. Specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

1.11 SUBSTITUTION REQUEST FORM

A. Use Substitution Request Form in on page 01 35 00-5.

B. Submit one form (4 copies) for each request.

END OF SECTION
SUBSTITUTION REQUEST FORM

Page 1 of 2

TO: __________________________________________________________________________________________________________

PROJECT: _______________________________________________________________________________________________________

We hereby submit for your consideration the following product instead of the specified item for the above project:

SECTION: ________________________ PARAGRAPH: ________________________ SPECIFIED ITEM: ________________________

Proposed Substitution: __________________________________________________________________________________________

Attach:  1) Complete technical data, including laboratory tests, if applicable.
        2) Complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

A. Does the substitution affect dimensions on Drawings?

______________________________________________________________________________________________________________

B. Will the undersigned pay for changes to the project design, including engineering and detailing costs caused by the requested substitution?

______________________________________________________________________________________________________________

C. What affect does substitution have on other trades?

______________________________________________________________________________________________________________

D. Differences between proposed substitution and specified item?

______________________________________________________________________________________________________________

E. Manufacturer's guarantees of the proposed and specified items are:

    _____ Same    _____ Different (explain on attached sheet)
SUBSTITUTION REQUEST FORM

Page 2 of 2

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Submitted By:

Signature ____________________________________________
Firm ________________________________________________
Address _____________________________________________
Date _________________________________________________
Telephone ____________________________________________

For Use by Design Consultant

Accepted
Accepted as Noted
Not Accepted
Received Late
By ________________________________
Date _____________________________
Remarks __________________________

Material Substitution Procedures
01 35 00–6
SECTION 01 42 13
DEFINITIONS AND ABBREVIATIONS

PART 1  GENERAL

1.1  DEFINITIONS AND TERMS

A. Whenever in these Specifications, or in other Contract Documents, the following terms are used, the intent and meaning shall be interpreted as follows:

1. **Board**: Tulare County Board of Supervisors.

2. **Calendar Day**: Every day shown on the calendar.

3. **Contractor**: The word “Contractor” means the person, firm or corporation to whom the award is made. Subcontractors as such will not be recognized.

4. **Contract Unit Price**: The Contractor’s original bid for a single unit of an item of work in the Proposal.

5. **Contract Time**: The number of calendar days for completion of the Work, including authorized time extensions. In the event a calendar date is specified for Project completion in lieu of a number of calendar days, the Work shall be completed by that calendar date. The Contract Time shall be computed by excluding the first and including the last day; and if the last day is Sunday or a legal holiday, that shall be excluded.


7. **Equipment**: (Construction) - All machinery and equipment, together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of work. (Installed) - All material or articles used in equipping a facility as furnishings or apparatus to fulfill a functional design.

8. **General Conditions**: As specified in Section 000700 – General Conditions.

9. **General Requirements**: All specifications contained in Division 1.

10. **Notice**: Any notice allowed or required to be given by the Owner may be given by the Engineer.

11. **Owner**: Tulare County.

12. **Person**: Any individual, association, partnership, corporation, trust, joint venture or other legal entity.
13. Plans: The drawings, profiles, cross-sections, working drawings and supplemental drawings, or reproduction thereof, approved by the Engineer, which show the location, character, dimensions or details of the work.


15. Reference Documents: Bulletins, Rules, Methods of Analysis or Test, Codes, Standards, and Specifications of public or private agencies, Engineer Societies, or Industrial Associations. Reference shall be to the latest edition thereof, including Amendments, which are in effect and published at the time the Request for Bids is issued, unless a specific edition is identified, in which case reference shall be to such specific edition. Reference Documents are intended to amplify the descriptions of materials, equipment, and construction systems and are to be considered a part of the Contract Documents insofar as the various sections thereof are referred to hereinafter. Examples of Reference Documents are Federal Specifications, State Standard Specifications, and those of American Society of Testing Materials (ASTM), American National Standards Institute (ANSI), American Standards Associations (ASA), and American Concrete Institute (ACI).

16. Salvage: The protection storage, and/or removal of specified existing equipment, parts or materials during the work for retention and later use by the Owner.

17. Sanitary Sewer: Any conduit and appurtenances intended for the reception and transfer of sewage.


20. State Standard Specifications: Standard Specifications for the project are those entitled "Standard Specifications, State of California, Business and Transportation Agency, Department of Transportation", current version, hereinafter referred to as the State Standard Specifications. These Specifications are to be considered a part of the Contract Documents insofar as they are not superseded by other provisions contained in Divisions 0 through 48 of these Specifications.

21. Storm Sewer: Any conduit and appurtenances intended for the reception and transfer of storm water.

22. Street: Any public road, highway, parkway, freeway, alley, walk or right-of-way.
23. **Surety**: Any individual, firm or corporation bound with and for the Contractor for the acceptable performance, execution and completion of the Work, and for the satisfaction of all obligations incurred.

24. **Utility**: Tracks, overhead of underground wires, pipelines, conduits, ducts or structures, sewers of storm drains owned, operated or maintained in or across a public right-of-way or private easement.

25. **Water Main**: Any conduit and appurtenances intended for the distribution of water.

26. **Working Day**: Any weekday (Monday through Friday), not a designated national holiday, during which weather allows the Contractor to work four or more hours consecutively, starting no later than 10:00 AM.

### 1.2 REFERENCED STANDARDS

A. The standards referred to, except as modified, shall have full force and effect as though printed in this Specification, and shall be the latest edition or revision thereof in effect on the bid opening date, unless a particular edition or issue is indicated. Copies of these standards are not available from the Owner. The Engineer will furnish, upon request, information as to how copies may be obtained.

### 1.3 LIST OF ABBREVIATIONS

A. Abbreviations and terms, or pronouns in place of them, shall be interpreted as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Name</th>
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<tbody>
<tr>
<td>AA</td>
<td>Aluminum Association</td>
</tr>
<tr>
<td>AABC</td>
<td>Associated Air Balance Council</td>
</tr>
<tr>
<td>AAMA</td>
<td>Architectural Aluminum Manufacturers Association</td>
</tr>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ABMA</td>
<td>American Boiler Manufacturers Association</td>
</tr>
<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
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<tr>
<td>ACPA</td>
<td>American Concrete Pipe Association</td>
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<tr>
<td>ADC</td>
<td>Air Diffusion Council</td>
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<tr>
<td>AEIC</td>
<td>Association of Edison Illuminating Companies</td>
</tr>
<tr>
<td>AFBMA</td>
<td>Antifriction Bearing Manufacturers Association</td>
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<tr>
<td>AGA</td>
<td>American Gas Association</td>
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<tr>
<td>AGMA</td>
<td>American Gear Manufacturers Association</td>
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<td>AHA</td>
<td>American Hardboard Association</td>
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<tr>
<td>AI</td>
<td>Asphalt Institute</td>
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<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
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<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
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<tr>
<td>AISI</td>
<td>American Iron and Steel Institute</td>
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<tr>
<td>AITC</td>
<td>American Institute of Timber Construction</td>
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<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association</td>
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<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>APA</td>
<td>American Plywood Association</td>
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<tr>
<td>API</td>
<td>American Petroleum Institute</td>
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<tr>
<td>APWA</td>
<td>American Public Works Association</td>
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</tbody>
</table>
County of Tulare
Water System Improvements for Yettem & Seville

Definitions and Abbreviations

ARI  American Refrigeration Institute
ASA  (now U.S.A.S.I., USA Standards Institute) Association & its Standard Specifications
ASAHC American Society of Architectural Hardware Consultants
ASCE American Society of Civil Engineers
ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME American Society of Mechanical Engineers
ASSE American Society of Sanitary Engineers
ASTM American Society for Testing and Materials
AWG American Wire Gage
AWI Architectural Woodwork Institute
AWPA American Wood-Preservers’ Association
AWS American Welding Society
AWWA American Water Works Association
BHMA Builders Hardware Manufacturers Association
BIA Brick Institute of America (formerly SCPI)
CAL/OSHA California Occupational Safety and Health Administration
CALTRANS California Department of Transportation
CBC California Building Code
CCR California Codes of Regulations
CDA Copper Development Association
CEC California Electrical Code
CEQA California Environmental Quality Act
CFR Code of Federal Regulations
CISPI Cast Iron Soil Pipe Institute
CMAA Crane Manufacturers Association of America
CMC California Mechanical Code
CPC California Plumbing Code
CRA California Redwood Association
CRSI Concrete Reinforcing Steel Institute
CS Commercial Standard (U.S. Department of Commerce)
DHI Door and Hardware Institute
DIPRA Ductile Iron Pipe Research Association
EEI Edison Electric Institute
EJCDC Engineers’ Joint Contract Documents Committee
EPA Environmental Protection Agency
FED SPEC Federal Specification
FCI Fluid Controls Institute
FGMA Flat Glass Marketing Association
FIA Factory Insurance Association
FM Factory Mutual
FSA Fluid Sealing Association
FTI Facing Tile Institute
HEI Heat Exchange Institute
HMI Hoist Manufacturers Institute
HPMA Hardwood Plywood Manufacturers Association
HTI Hand Tools Institute

Definitions and Abbreviations
01 42 13–4
Definitions and Abbreviations

ICBO    International Conference of Building Officials
I-B-R   Institute of Boiler and Radiator Manufacturers
IEEE    Institute of Electrical and Electronics Engineers
IES     Illuminating Engineering Society
IFI     Industrial Fasteners Institute
IPCEA   Insulated Power Cable Engineers Association
ISA     Instrument Society of America

JIC  Joint International Conference (Hydraulic Institute)

MHI Material Handling Institute
MIL     Military Specification
MMA     Monorail Manufacturers Association
MSS     Manufacturers’ Standardization Society

NAAMM   National Association of Architectural Metals Manufacturers
NACE    National Association of Corrosion Engineers.
MBBPVI  National Board of Boiler and Pressure Vessel Inspectors
NBHA    National Builders Hardware Association
NCSPA   National Corrugated Steel Pipe Association
NE     National Electrical Code
NECA    National Electrical Contractors Association
NEMA    National Electrical Manufacturers Association
NEMI    National Elevator Manufacturing Industry
NFPA    National Fire Protection Association
NIST    National Institute of Standards and Technology
NLA     National Lime Association
NPC     National Plumbing Code
NPT     National Pipe Thread
NRCA    National Roofing Contractors’ Association
NRMCA   National Ready Mixed Concrete Association
NSC     National Safety Council
NSF     National Sanitation Foundation
NTMA    National Terrazzo and Mosaic Association
NWMA    National Woodwork Manufacturers Association

OSHA    Occupational Safety and Health Administration

PCA     Portland Cement Association
PCI     Prestressed Concrete Institute
PDI     Plumbing and Drainage Institute
PFI     Pipe Fabrication Institute
PS      Product Standard

RTI     Resilient Tile Institute (formerly AVATI)

SAE     Society of Automotive Engineers
SCPRF   Structural Clay Products Research Foundation
SI      International Systems of Units (Metric)
SIGMA   Sealed Insulating Glass Manufacturers Association
SFPA    Southern Forest Products Association
SJI     Steel Joist Institute
SMA     Screen Manufacturers Association
SMACNA  Sheet Metal and Air Conditioning Contractors National Association
Definitions and Abbreviations

SPFA  Steel Plate Fabricators Association
SPI  Society of the Plastics Industry
SPTA  Southern Pressure Treaters Association
SSI  Scaffolding and Shoring Institute
SSPC  Steel Structures Painting Council
SSPWC  Standard Specifications for Public Works Construction (Greenbook)

UL  Underwriters' Laboratories
UPC  Uniform Plumbing Code
USBR  U.S. Bureau of Reclamation
USGS  United States Geological Survey

WCLA  West Coast Lumbermen's Association (Std. Grading and Dressing Rule)
WCLIB  West Coast Lumber Inspection Bureau
WIC  Woodwork Institute of California
WRI  Wire Reinforcement Institute, Inc.
WWPA  Western Wood Products Association

END OF SECTION
SECTION 01 43 00
QUALITY CONTROL AND TESTING

PART 1  GENERAL

1.1 NOTICE OF DEFECTS
   A. Prompt notice of all defective Work of which Owner or Engineer has actual
      knowledge will be given to Contractor.
   B. All defective Work may be rejected, corrected, or accepted, at the discretion of the
      Owner and Engineer.

1.2 ACCESS TO WORK
   A. Owner, Engineer, their consultants and other representatives and personnel of
      Owner, independent testing laboratories, and governmental agencies with
      jurisdictional interests shall have access to the Site and the Work at reasonable
      times for their observation, inspecting, and testing. Contractor shall provide them
      proper and safe conditions for such access and advise them of Contractor's Site
      safety procedures and programs so that they may comply therewith.

1.3 MATERIALS AND EQUIPMENT
   A. Materials and equipment shall be subject to the requirements of Section 01 35 00
      – Materials and Substitutions.

1.4 PROJECT SITE TESTING
   A. Contractor shall give Engineer timely notice of readiness of the Work for all
      required inspections, tests, or approvals and shall cooperate with inspection and
      testing personnel to facilitate required inspections or tests.
   B. Except for specified material suitability tests, all initial routine tests of materials
      shall be at the expense of the Owner and shall be performed by an independent
      certified laboratory designated by the Owner. Whenever a specified percent
      relative compaction test is required and the material or portion thereof so tested
      fails to meet or exceed the relative compaction specified, all subsequent retesting
      shall be performed at the expense of the Contractor.
   C. All material suitability tests shall be at the expense of the Contractor. Testing shall
      be by an independent certified laboratory approved by the Engineer.

1.5 TEST STANDARDS
   A. All sampling, specimen preparation, and testing of materials shall be in
      accordance with the standards of nationally recognized technical organizations.
B. The physical characteristics of all materials not particularly specified shall conform to the latest standards published by the ASTM, where applicable.

1.6 UNCOVERING WORK

A. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without concurrence of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and recovered at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be re-observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall promptly correct said defects, including all work involved in uncovering and recovering the work, at no cost to the Owner.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction.

1.7 CORRECTION OR REMOVAL OF DEFECTIVE OR REJECTED WORK

A. Upon receipt of notice, Contractor shall correct all defective or rejected Work and replace it with Work that is not defective, at no cost to the Owner.

1.8 ACCEPTANCE OF DEFECTIVE WORK

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so.

1. If any such acceptance occurs, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted.

2. Engineer shall determine the reasonableness of the diminished value of Work so accepted and Contractor shall pay all costs involved in making such determination.

END OF SECTION
SECTION 01 50 00
TEMPORARY FACILITIES

PART 1 GENERAL

1.1 GENERAL

A. The Contractor shall provide all temporary facilities and utilities required for completion of the Work as well as safety precautions and programs. No attempt is made to set out in detail the Contractor's means or methods necessary to accomplish the tasks involved.

1.2 TEMPORARY UTILITIES

A. Water

1. See Section 01 51 36 - Watering of these specifications for details.

2. Water used for human consumption shall be kept free from contamination and shall conform to the requirements of the State and local authorities for potable water.

B. Sanitary Facilities

1. The Contractor shall provide suitable and adequate sanitary conveniences for the use of his staff at the site of the Work. Such conveniences shall include chemical toilets or water closets and shall be located at appropriate locations at the site of the Work. All sanitary conveniences shall conform to the regulations of the public authority having jurisdiction over such matters. At the completion of the Work, all such sanitary conveniences shall be removed and the site left in a sanitary condition.

2. With respect to sanitation facilities, the Contractor shall cooperate with and follow directions of representatives of the Public Health Service and the State. State and County Public Health Service representatives shall have access to the Work, whether it is in preparation or progress, and the Contractor shall provide facilities for such access and inspection.

1.3 TEMPORARY CONSTRUCTION FACILITIES

A. Construction hoists, shoring, and similar temporary facilities shall be of ample size and capacity to adequately support and move the loads to which they will be subjected. Railings, enclosures, safety devices, and controls required by law or for adequate protection of life and property shall be provided.

B. Temporary supports shall be designed with an adequate safety factor to assure adequate load bearing capability. The Contractor shall submit design calculations
prepared by a professional registered engineer for staging and shoring prior to application of loads.

C. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations from one hour before sunset each day to one hour after sunrise of the next day until such excavation is entirely refilled, compacted, and paved. All excavations shall be barricaded in such a manner as to prevent person from falling, walking, or otherwise entering any excavation in any street, roadway, parking lot, treatment plant, or any other area, public or private.

D. The Contractor shall adequately identify and guard all hazardous areas and conditions by visual warning devices and, where necessary, physical barriers. Such devices shall, as a minimum, conform to the requirements of Cal/OSHA.

E. At such time or times any temporary construction facilities and utilities are no longer required for the work, the Contractor shall notify the Engineer of his intent and schedule for removal of the temporary facilities and utilities, and obtain the Engineer's approval before removing the same. As approved, the Contractor shall remove the temporary facilities and utilities from the site as his property and leave the site in such condition as specified, as directed by the Engineer, and/or as indicated on the Plans.

1.4 ACCESS ROADS AND STAGING AREA

A. Adequately access shall be maintained to all storage areas and other areas to which frequent access is required. The Contractor shall limit the location of his storage of equipment and materials outside of the project site. The Contractor shall make his own arrangements for space that may be required and bear all associated costs. The Contractor shall provide any temporary storage required for the protection of equipment and materials as recommended by manufacturers of such materials.

B. Storage and protection:

1. Materials and equipment shall be stored in accordance with supplier's written instructions, with seals and labels intact and legible. Exposed metal surfaces of valves, fittings and similar materials shall be coated with accordance with manufacturer's recommendations to prevent corrosion.

2. Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure materials and equipment are undamaged and are maintained under required conditions.

END OF SECTION
SECTION 01 51 36
WATERING

PART 1 GENERAL

1.1 WORK INCLUDED
A. The work of this section consists of furnishing, hauling, and applying water required for compaction of embankments, backfills, subgrade, and base course, and other construction operation.

1.2 RELATED WORK
A. Section 01 50 00 – Temporary Facilities
B. Section 01 57 27 – Dust Control

1.3 REFERENCES
A. Section 17 - Watering, State Standard Specifications

PART 2 PRODUCTS

2.1 WATER
A. Free of debris, organic matter, and other objectionable substances.

PART 3 EXECUTION

3.1 WATER TRUCK
A. At least 1,000-gallon capacity.
B. Keep at least one water truck on site at all times, unless Engineer approves removal of the truck from the site before final completion.

3.2 APPLICATION
A. Use pressure type distributors or a pipeline equipped with sprinkler system. Provide approved meter devices near points of discharge.
B. Ensure a uniform application of water for optimum moisture content. Avoid excessive runoff and minimize water waste.
C. The Contractor may water excavation areas before excavating. Drill full depth of excavation to make moisture determinations.
D. If over watering occurs, de-water at no additional expense to the Owner.

3.3 SPECIAL CONTROLS

The Contractor shall take all reasonable means to minimize inconvenience and injury to the public by dust, noise, diversion of storm water, or other agencies under his control.

A. Dust Control

1. As specified in Section 01 57 27 – Dust Control

B. Water

1. The Contractor will not be allowed to use water from the Seville or Yettem water systems. The existing water systems do not have sufficient capacity to supply any water for construction, including dust control and initial filling, flushing and testing of the new water distribution system. The Contractor shall pay to purchase water and haul water to the construction site for construction activities and shall construct all facilities necessary to furnish water for his use during construction.

2. The Contractor shall use a Certified Water Hauler to supply potable water for initial filling, flushing, and testing of the new water distribution system. The Contractor is responsible for securing disinfected water that meets drinking water standards.

3. The Contractor shall make all arrangements to obtain water for construction from sources other than the County.

4. Water used for human consumption shall be kept free from contamination and shall conform to the requirements of the State and local authorities for potable water.

5. The Contractor shall obtain approval from the County for use of any non-potable well water used during construction.

6. Full compensation for furnishing all labor, materials, tools and equipment and for doing all work involved in furnishing and applying water as required by the Contract Documents and Specifications, State Standard Specifications, shall be considered as included in the contract unit prices paid for other items of work and no additional allowance will be made therefore.

END OF SECTION
PART 1 GENERAL

1.1 GENERAL

A. The Contractor shall implement the environmental protection measures described in the following sections, excepting those measures specifically identified to be completed by the Owner.

1.2 NOISE

A. Noise generating equipment used during construction shall be restricted to the hours from 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 6:00 p.m. on Saturday and Sunday. Construction outside of these hours shall require written approval by the Owner. Effective mufflers shall be fitted to gas-powered and diesel-powered equipment.

1.3 BIOLOGICAL RESOURCES

A. Requirements:

1. Prior to equipment being brought on site, the staging and work area limits will be clearly demarcated by the Contractor.

2. All construction workers on site are required to attend an environmental tailboard training conducted by a qualified biologist prior to the start of construction. The training will detail the measures to be implemented to protect sensitive resources in the project area. The Owner will hire a qualified biologist to conduct said training.

3. The Owner hired a biologist to delineate grassland areas within the project limits. Grasslands were delineated by the Owner’s biologist and are shown in the biological report included in the Appendix. All construction activities shall be restricted to the paved road area in areas adjoining designated grasslands. No construction equipment, trenching, spoil piles, material or equipment storage will be allowed outside the paved road area along designated grasslands areas. The Contractor shall furnish equipment as required to complete confine construction activities within the paved road area included in the various items of work and not additional payment will be made.

4. Excavation and ground disturbing construction activities should be scheduled to occur during the non-rainy season. It is anticipated that the non-rainy season will begin on May 1, 2018 and end on September 15, 2018. The Owner will hire a qualified biologist to conduct pre-construction
surveys to determine the actual start of the non-rainy season before the Contractor will be authorized to begin ground disturbing construction activities.

a. If excavation and construction activities occur outside of the non-rainy season, the Contractor will be required to furnish and install exclusion fencing for California Tiger Salamander (CTS) along the perimeter of the work areas.

b. Exclusion fencing shall be installed in conformance with Detail 1 on Sheet G00-09 of the Plans.

c. Exclusion fencing shall include a one-way escape ramps designed to allow CTS to exit the construction work area. The ramps shall be one-directional, designed to prevent CTS from re-entering the construction work area. Ramps may consist of a minimum 6-inch diameter PVC pipe cut in half lengthwise and attached to the outside of the fence, on both sides, so that it faces outward. The PVC pipe shall be backfilled with dirt to anchor it. Ramps shall be installed in 30-inch wide openings in the exclusion fence space not more than 200 feet apart. Ramps shall be located on both sides of the project perimeter and staggered by 100 feet.

d. At the option of the Owner, the Contractor may be required to install exclusion fencing at the edge of pavement to delineate the construction limits regardless of whether construction occurs during the non-rainy season. Exclusion fencing will be paid for at the unit price bid.

e. Exclusion fencing will be paid for at the unit price bid. The Contractor shall furnish and install fencing, maintain fencing during construction and remove fencing after construction is complete.

5. Exclusion fencing shall be installed around the new storage tank site and work areas for any hydrants, air valve assemblies, or other appurtenances located outside the paved road that are adjoining grassland areas regardless of the time of year. Pre-construction surveys will be conducted by the County’s biologist for these areas to determine the presence of ground squirrel burrows or other sensitive habitat. The Owner will hire a qualified biologist to conduct pre-construction surveys no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities.

a. If burrows are discovered, a no impact buffer for any construction outside of paved road areas will be established and the buffer area will be off limits to construction.

6. The Owner will hire a qualified biologist to monitor open trenches and inspect exclusion fencing.
B. Site Maintenance Requirements:

1. Construction equipment shall arrive at the site clean to prevent the potential spread of noxious weeds.

2. Waste and recycling receptacles that discourage foraging by wildlife species adapted to urban environments shall be installed and maintained, by the Contractor, in common areas throughout the project site for the duration of construction.

1.4 CULTURAL RESOURCES

A. Discovery of Archaeological and Human Remains:

1. If archaeological features or materials are unearthed during any phase of project activities, activities within fifty (50) feet of the find shall cease until Contractor has contacted the California State Historic Preservation Office (SHPO), and the significance of the resource has been evaluated. Any mitigation measures that may be deemed necessary must have the approval of SHPO, and shall be implemented, pursuant to the Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation, 48 CFR 44716, by a qualified archaeologist representing the Owner prior to the resumption of construction activities.

2. If human remains are exposed by activity related to the project, the Contractor shall comply with California State Health and Safety Code, Section 7050.5, which states that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to California Public Resources Code, Section 5097.98.
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END OF SECTION
SECTION 01 57 23

STORM WATER POLLUTION PREVENTION PLAN

PART 1 GENERAL

1.1 WORK INCLUDES

A. The Contractor shall furnish and exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution and provide all labor, materials, tools, and equipment necessary to prevent storm water pollution associated with construction activities, including preparation of Stormwater Pollution Prevention Plan (SWPPP) and amendments, installation, maintenance and final removal of all temporary and permanent erosion and sediment control measures, in accordance with the requirements of the Contract Documents.

B. The Contractor shall apply for and obtain coverage under State of California Construction General Permit Order 2009-0009-DWQ as amended per 2010-0014-DWQ and 2012-0006-DWQ (CGP) at least two weeks before starting Work and shall implement storm water pollution prevention measures as prescribed in the approved SWPPP to prevent sediment from entering streams or water bodies throughout the duration of the Work in compliance with the permit requirements. Work shall be performed in accordance with all Federal, State, and local regulations.

1. The Legally Responsible Party (LRP) is the County of Tulare.

2. The Approved Signatory for the LRP will be a representative designated by the County of Tulare.

3. Contractor shall coordinate with Engineer and LRP to become a Data Entry Person for the purpose of the Project. This will allow Contractor to upload the required reports and plans to the SMARTS system. Each upload will still require certification by the LRP, and it shall be Contractor’s responsibility to notify Engineer and LRP of each SMARTS upload so that LRP can make the necessary approval.

C. Penalties: Failure to comply with this Section may result in significant fines and possible imprisonment. The Regional Water Quality Control Board (RWQCB) or other prosecuting authority may assess fines for each violation. Should the Owner be fined or penalized as a result of the Contractor failing to comply with this Section and applicable permit requirements, the Contractor shall reimburse the Owner for any and all fines, penalties and related costs.

D. All costs for work required for compliance with this Section shall be included in the price bid for Prepare & Implement SWPPP.
1.2 SUBMITTALS

A. As specified in the General Conditions and Section 01 33 00 – Submittal Procedures.

B. Submittals under this section shall be completed and submitted at least two weeks prior to beginning work and within 10 days of issuance of the Notice to Proceed. A copy of the SWPPP, Permit Registration Documents, annual reports, and all other permit compliance documents submitted to the State Water Board via the SMARTS system shall be provided to the Engineer for reference and shall be kept onsite in either a job trailer or accessible lockbox.

1. Submit Risk Level calculation and results from the SMARTS web site.

2. SWPPP plan sheets should include, but are not limited to, proposed arrangements and methods for control of erosion, sedimentation, and pollutant conveyance in storm water resulting from demolition and construction activities. Plan sheets shall show that the plans satisfy all Federal and State NPDES permit requirements.

3. Provide sufficient information to permit evaluation of:
   a. Catch basin protection measures.
   b. Sheet-flow erosion protection
   c. Rill, swale and gully erosion protection
   d. Management of upland flows coming onto the site.
   e. Surface restoration.
   f. Post-construction measures

4. Submit narrative describing the means/methods by which the maintenance/inspection procedures will be accomplished. This shall include a schedule for inspection/monitoring of all Storm Water Pollution Prevention BMPs.

5. Submit construction details for all proposed BMPs. All BMPs and details shall be in accordance with Section 1.6 below.

6. Submit all required inspection reports (weekly, quarterly, storm event (pre, during and post), and sampling results) to QSD & LRP within 24 hours of inspection.

C. Certifications

1. Copy of the Certificate of Training issued by CASQA demonstrating qualification of the designated QSD
2. Copy of the Certificate of Training issued by CASQA demonstrating qualification of the designated QSP(s).

1.3 QUALITY ASSURANCE

At minimum, the following measures shall be taken to help ensure control of storm water based pollution. These measures shall not be construed to limit or override the measures set forth and called for in the SWPPP as submitted to the SMARTS system.

A. Control the rate and effect of dewatering in such a manner as to avoid all objectionable settlement and subsidence and to assure the integrity of the finished work.

B. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, establish reference points and observe at frequent intervals to detect any settlement that may develop. Conduct the dewatering operation in a manner that protects adjacent natural resources and facilities. Cost of repairing all damage to adjacent resources and facilities shall be the sole responsibility of the Contractor.

C. Before commencing grading, excavation or filling in any part of the site, Contractor shall construct swales, diversion channels, inlet protection barriers, sedimentation traps, and other measures to guide runoff away from the work area and to capture eroded material before it reaches natural water courses. The measures shall be in accordance with the approved storm water pollution prevention plans.

D. Arrange demolition activities to minimize erosion to the maximum practical extent. Clearing, excavation, and grading shall be limited to those areas of the Project site necessary for demolition. Minimize the area exposed and unprotected.

E. Clearly mark and delineate the work limits activities. Equipment shall not be allowed to operate outside the limits of work or to disturb existing vegetation. Excavation and grading shall be completed during the dry season to the maximum extent possible.

1.4 GENERAL REQUIREMENTS

A. The Contractor shall exercise care in preserving vegetation and protecting property, to avoid disturbing areas beyond the limits of the Work and promptly repair any damage caused by Contractor operations.

B. The Contractor shall provide all necessary water pollution control devices to prevent, control, and abate water pollution, and implement good housekeeping pollution control measures to reduce the discharge of pollutants from the Site to the maximum extent practicable. These water pollution control devices include structural BMPs, drains, gutters, slope protection blankets and retention basins and shall be constructed concurrently with other Work at the earliest practicable time.
C. Stockpiles of earth and other construction-related materials shall be protected from being transported from the Site by wind or water.

D. The Contractor shall properly store and handle fuels, oils, solvents, and other toxic materials in a manner not to contaminate the soil or surface waters, enter the groundwater, or be placed where they may enter a live stream, channel, drain, or other water conveyance facilities. All approved toxic storage containers shall be protected from weather. Spills shall be cleaned immediately and cleanup materials shall be properly disposed of. Spills shall not be washed into live streams, channels, drains, storm drains, or other water conveyance facilities.

E. Excess or waste concrete shall not be washed into the public way or any drainage systems. The concrete wastes shall be retained on-site until they can be appropriately disposed of or recycled. Concrete wastes shall not be washed into live streams, channels, drains, storm drains, or other water conveyance facilities.

F. Non-stormwater runoff from equipment or vehicle washing and any other activities shall be contained at the work site and properly disposed of. Non-stormwater runoff shall not be allowed to enter live streams, channels, drains, storm drains, or other water conveyance facilities.

G. The Contractor shall prevent sediments and other materials to be tracked from the Site by vehicle traffic. Construction entrance roadways shall be stabilized to inhibit sediments from being deposited onto public ways. The Contractor shall immediately sweep up accidental depositions and not allow depositions to be washed away by rain or by any other means.

1.5 REGULATORY REQUIREMENTS

A. The Contractor shall comply with the requirements of the State Water Resources Control Board (SWRCB), RWQCB, Owner and any other agencies having jurisdiction in stormwater discharges and non-stormwater waste management.

B. General Permit Registration Documents:

1. The Contractor shall employ or contract with qualified personnel to prepare all Permit Registration Documents (PRDs), changes of information, annual reporting, Notice of Termination (NOT), and other compliance documents in accordance with the requirements of Article VII of the CGP. The PRDs include the following documents: Notice of Intent (NOI), construction site risk assessment, Site map, SWPPP, annual fee, signed certification statement, and other documents required by the CGP.

2. All engineering calculations, reports, and drawings shall be prepared, sealed and signed by a California licensed engineer in accordance with California Business and Professional Code Section 6700, et seq.

3. The Contractor’s qualified personnel shall file the above documents electronically through the State Water Board’s Storm Water Multiple Application and Report Tracking System (SMARTS) website. Storm Water Pollution Prevention Plan 01 57 23–4
Contractor shall mail appropriate annual fee to the State Water Board no later than fourteen (14) days prior to the commencement of construction activities and shall pay all annual fees for subsequent years as required by the CGP.

4. The Contractor shall not commence any construction work until a Waste Discharger Identification (WDID) number assigned by the State Water Board is received. The Contractor shall provide the WDID to the Construction Manager, as evidence of the submission of the PRDs.

C. The Contractor shall comply with the following prohibitions and limitations:

1. Discharge prohibitions shall be in accordance with Article III of the CGP.

2. Effluent released from the project site shall meet the requirements of Article V of the CGP.

3. Receiving water limitations shall comply with the requirements of Article VI of the CGP.

1.6 STORM WATER POLLUTION PREVENTION PLAN DEVELOPMENT AND IMPLEMENTATION

A. General Requirements:

1. Contractor shall cause to be prepared by a certified QSD, a Storm Water Pollution Prevention Plan implementing the requirements of the CGP for the specified project type and Risk Level.

2. Contractor shall correctly determine the appropriate Risk Level for the project using the Risk Calculator contained within the SMARTS web site. Risk Level is a complex calculation dependent upon site characteristics, site area, project location, type and character of receiving water, and construction schedule, and will not be known with certainty until all necessary data is entered into the SMARTS system.

B. SWPPP Specifications:

1. The SWPPP must be prepared in full conformance with the requirements of Article XIV of the CGP, for the respective project type and Risk Level.

2. The SWPPP must describe the erosion control practices to be implemented during demolition and construction and the selection and implementation of appropriate BMPs to account for site-specific and seasonal conditions. As the SWPPP is considered as a dynamic document, the Contractor shall change and amend the SWPPP as construction conditions and activities warrant.
3. The SWPPP shall be developed and revised by a QSD retained by the Contractor.

4. Implementation of all BMPs and all required site monitoring and water testing shall be overseen by a QSP employed or retained by the Contractor.

5. All erosion and sediment control measures shall be implemented as specified in the SWPPP. Erosion and sediment control may consist of one or more of the following elements, plus other measures as may be appropriate to the specific site:
   a. Maintenance of existing permanent or temporary storm drainage systems, as necessary.
   b. Construction of new permanent and temporary storm drainage systems, as necessary.
   c. Construction of temporary erosion and sediment control facilities, such as silt fences, sediment traps, earth dike/drainage swales and ditches, sandbag barriers, etc.
   d. Placement and maintenance of topsoil and seeding in areas disturbed by construction and all areas not occupied by structures or pavement in accordance with the requirements of Section 02282 – Erosion Control (Vegetative).

6. A copy of the SWPPP, including working details (fact sheets) for construction site BMPs and applicable amendments, shall be kept and maintained by the Contractor on the construction site and continuously updated in accordance with CGP requirements to reflect current site conditions throughout the duration of the project.

C. The Contractor shall implement all activities required by the CGP for the type and Risk Level of the project at hand and as detailed in the SWPPP. The SWPPP shall include, at minimum, the following information.

1. Identification of potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the Site.

2. Calculations supporting the adequacy of selected BMPs to control erosion on the site during the Compliance Storm Event.

3. Description of proposed practices which will be used to reduce the pollutants in storm water discharge from the Site.

4. Identification and selection of applicable best management practices (BMPs), including BMPs for erosion and sediment control and BMPs for non-stormwater management, material management, and contractor activities.

Storm Water Pollution Prevention Plan
01 57 23–6
5. All stormwater or non-stormwater pollution prevention activities specified in the SWPPP shall comply with the guidance provided in the “Stormwater Best Management Practice Handbook, Construction,” November 2009 or more current edition, published by the California Stormwater Quality Association (CASQA), which is available for purchase from the CASQA website.

6. Details of the placement of physical BMPs required for installation and the methods used to comply with those BMPs. The Contractor’s preferred techniques shall show how it will comply with the stated objectives of the SWPPP and the terms of the CGP.

7. A completed copy of the permit, and BMP Inspection Report Template except for the effective date.

8. BMP inspection reports as required by the CGP.

D. Non-Stormwater Management: As specified in CGP Attachment C, D or E as appropriate to the project Risk Level, the SWPPP shall discuss any non-stormwater sources (i.e., landscaping irrigation, pipe flushing, street washing and dewatering). In addition, the SWPPP shall include standard observation measures and BMPs, including BCT/BAT practices that are to be implemented in order to reduce the pollutant loading in the discharge waters.

E. Amendments: All SWPPP amendments shall be prepared by the QSD at no additional cost to the Owner.

1. The Contractor shall, at no additional cost to the Owner, amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of pollutants to stormwater.

2. The Contractor shall, at no additional cost to the Owner, amend the SWPPP if it is in violation of any conditions of the CGP or has not achieved the general objective of reducing pollutants in stormwater discharges.

F. Annual Reporting: The Contractor shall submit to the SWRCB via the SMARTS system an annual report, no later than September 1st of each year, in accordance with the requirements of Article XVI of the CGP, including but not limited to: a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year and identification of any compliance activities or corrective actions that were not implemented. A project of 90 days or more duration can require more than one Annual Report. See below.

1. An Annual Report is required while the Project is still under construction, if construction begins not later than June 1 of a calendar year and is not completed by September 1 of that same year.

2. An Annual Report is required, without exception, prior to the September 1 following project completion.
3. Example: A project commencing on May 31 and completed on September 2 of the same year would require an annual report both by September 1 of the construction year, and by September 1 of the year following.

G. Notice of Termination: Once construction is completed and the Site has been stabilized with final, sustainable cover, the Contractor shall prepare a Notice of Termination (NOT), including a final site map, photos, and a final project Annual Report, shall obtain necessary signatures from the LRP and shall submit all through the State Water Board’s SMARTS website and within 90 days after all land disturbing activities end and construction is complete, in accordance with Article II D of the CGP.

A Notice of Termination is distinct from an Annual Report. Both are required.

PART 2 PRODUCTS

2.1 GENERAL

A. Materials furnished for BMPs shall meet the requirements of the California Stormwater Quality Association, Stormwater Best Management Practice Handbook, Construction – November 2009 edition (or most current version) unless otherwise indicated.

B. Before the work begins, sufficient equipment shall be available on the site to assure that the operation and adequacy of the erosion control plans can be continuously maintained.

PART 3 EXECUTION

3.1 GENERAL DESCRIPTION

A. The Contractor shall install and maintain all erosion and sediment control measures and carry out inspection in accordance with the Drawings and the approved SWPPP.

B. Sediment transport and erosion from working stockpiles shall be controlled and restricted from moving beyond the immediately stockpile area by implementing applicable BMPs, including but not limited to construction of temporary toe-of-slope ditches and accompanying silt fences as necessary. If the BMPs proposed in the SWPPP prove inadequate to control sediment transport and erosion on the Site, the Contractor shall without delay implement additional provisions to obtain effective control. The SWPPP shall be updated to reflect the necessary changes as discussed in paragraph 1.6 above.

C. The Contractor shall be responsible for taking the proper actions to prevent contaminants and sediments from leaving the project Site. The Contractor shall take immediate action if directed by the Construction Manager, or if the Contractor...
observes contaminants and/or sediments entering the storm drainage system, to prevent further stormwater from entering the system.

3.2 NOTIFICATION AND REPORTING

A. If non-stormwater pollution occurs in the work area for any reason or when the Contractor becomes aware of any violation of this Section, the Contractor shall correct the problem and shall follow the requirements of the SWPPP for monitoring, control and reporting of non-stormwater discharges.

3.3 FIELD QUALITY CONTROL

A. The Contractor shall maintain the BMPs and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures.

Should the QSP note any deficiencies in necessary BMPs during the course of QSP's inspections and reporting, Contractor shall immediately repair or replace the defective BMPs as required by the QSP.

3.4 INSPECTIONS

A. The Contractor's QSP shall inspect disturbed areas of the construction site, areas that have not been finally stabilized used for storage of materials exposed to precipitation, stabilization practices, structural practices, other controls, and area where vehicles exit the Site at least weekly, and within 48 hours prior to a storm event (with NOAA probability prediction of 50% or greater), every 24 hours during the storm event (during normal business hours) and within 48 hours of the end of any storm that produces 0.5 inches or more rainfall at the site.

B. The Contractor's QSP shall inspect disturbed areas and areas used for material storage that are exposed to precipitation for evidence of, or the potential for, pollutants entering the drainage system and observe erosion and sediment control measures identified in the SWPPP to ensure that they are operating correctly.

C. The Contractor's QSP shall inspect discharge locations or points to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Inspect locations where vehicles exit the Site for evidence of offsite sediment tracking.

D. If required by the Project's Risk Level, Contractor's QSP shall conduct necessary Rain Event Monitoring as required under the CGP.

E. Inspection Reports: For each inspection conducted, prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, maintenance performed, and actions taken.

Furnish the report to the Engineer within 24 hours of the inspection as a part of Storm Water Pollution Prevention Plan 01 57 23–9
3.5 RECORDS

A. The Contractor shall retain records/copies of data used to complete the PRDs; the SWPPP and all attachments and amendments; compliance certifications; notifications of non-compliance; training; incidents such as spills or other releases, including photographs as available; sampling and analysis of discharges discovered through visual monitoring; all reports required by the CGP; BMP inspections and checklists, and maintenance and repair activities; and activity-based BMPs, such as good housekeeping, that have been implemented.

B. After the work is complete and finally accepted by the Owner, submit to the Engineer all records/copies of documents required by the CGP, including, but not limited to, the records/copies of the documents noted above and all documents uploaded to the SMARTS system.

3.6 MAINTENANCE OF TEMPORARY FACILITIES

A. Inspect erosion and sediment control structures daily and as specified in the SWPPP.

B. Sediment shall be removed from behind run off control structures after each storm, or as directed by the Engineer, QSD or QSP.

C. If areas are seeded, Contractor shall examine those areas during and after major storms to check that grass is becoming established.

3.7 DISPOSAL OF SEDIMENT FROM STORM WATER POLLUTION CONTROL STRUCTURES

A. Sediment excavated from temporary sediment control structures shall be disposed on the site with general fill or with topsoil. Sediment shall be allowed to dry out as required before reuse. All trash shall be removed before reuse.

B. Contractor shall place the sediment removed from traps and other structures where it will not enter a storm drain or water course and where it will not immediately reenter the basin.

3.8 REMOVAL OF TEMPORARY STORM WATER POLLUTION CONTROL MEASURES

A. In accordance with SWPPP requirements, temporary control measures shall be removed once grading is completed and slopes have stabilized, and permanent drainage works have been constructed. Contractor shall not breach any temporary control structures until the associated catchment area is complete unless approved by the Engineer.

END OF SECTION
SECTION 01 57 27
DUST CONTROL

PART 1  GENERAL

1.1 WORK INCLUDED

A. The work of this section consists of implementing measures to prevent air pollution during construction activities, in accordance with Federal, State, and local regulations, and in accordance with the Dust Control Plan (DCP). The DCP can be amended, by the Owner and/or Contractor, as needed should revisions be determined necessary during construction activities.

1.2 RELATED WORK

A. Section 01 50 00 – Temporary Facilities
B. Section 01 51 36 – Watering
C. DIVISION 31 –Earthwork

1.3 REFERENCES

A. San Joaquin Air Pollution Control District (SJVAPCD) Regulation VIII.
B. Dust Control Plan Fee, Pursuant to the adoption of Rule 3135, Adopted October 20, 2005 and subsequent revisions, compliance assistance bulletins and editions regarding Rule 3135 and PM 10 regulations.

1.4 SUBMITTALS

A. As specified in the General Conditions and Section 01 33 00 – Submittal Procedures.
B. Submit, prior to beginning work and within 15 days of issuance of the Notice to Proceed a DCP.
   1. The DCP shall show proposed arrangements and methods for dust control. Show that the plans satisfy all SJVAPCD, State, and Federal Requirements.
   2. Provide proof that the revised DCP has been submitted to the SJVAPCD for review and approval.

1.5 QUALITY ASSURANCE

A. Control the rate and effect of watering in such a manner as to avoid all objectionable settlement and subsidence as approved by the Engineer and to assure the integrity of the finished work.
B. Before commencing grading, excavation or filling in any part of the site, Contractor shall construct the required measures specified in the DCP.

C. Arrange demolition activities to minimize dust to the maximum practical extent. Clearing, excavation, and grading shall be limited to those areas of the Project site necessary for construction. Minimize the area exposed and unprotected.

D. Clearly mark and delineate the work limits activities. Equipment shall not be allowed to operate outside the limits of work or to disturb existing vegetation.

1.6 REGULATORY REQUIREMENTS

A. Contractor shall comply with all provisions of the SJVAPCD regulations, as well as Federal and State regulations.

B. The requirements of the Dust Control Plan shall apply continuously through the duration of the Contract.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Before the work begins, sufficient equipment and resources shall be available on the site to assure that the operation and adequacy of the dust control measures can be continuously maintained.

2.2 DUST CONTROL MEASURES

A. The Contractor shall secure and provide water for dust control as specified in section 01 50 00 – Temporary Facilities.

B. Dust Suppressants shall be polymer emulsions or hygroscopic suppressants. Petroleum emulsions and bituminous materials will not be allowed.

   1. If dust suppressants other than water are utilized, Contractor shall submit MSDS, Manufacturer’s Usage Instructions, and certification by the manufacturer that the product is safe for ground application.

   2. If dust suppressants other than water are utilized, contractor shall notify owner 15 days prior to use for notification to the SJVAPCD.

C. Gravel used for Gravel Pads shall be washed gravel, a minimum of one inch in diameter, and shall be placed a minimum of six inches deep.

PART 3 EXECUTION

3.1 GENERAL DESCRIPTION

A. Dust control measures shall include, but may not be limited to: Water application, dust suppressant application, physical barriers limiting site access, reduction of
vehicle speed on site, utilization of gravel pads, utilization of grizzlies, and wheel washers. If physical barriers are utilized, the Engineer shall approve the location, size, and type. Physical barriers shall be removed upon project completion.

B. Furnish, install, maintain, and operate necessary control measures and other equipment necessary to prevent dust. Temporary measures shall be to Contractor’s own design and Contractor shall be solely responsible for risks related to the management of dust control during construction.

3.2 METHODS
A. As described in the DCP and approved by the Engineer.

3.3 MAINTENANCE OF TEMPORARY FACILITIES
A. Inspect dust control facilities daily and as specified in the DCP.

B. Sediment shall be removed from grizzlies, gravel pads, and/or paved surfaces as required by the DCP, or as directed by the Engineer.

C. If areas are seeded, contractor shall examine those areas during or after major storms to check that grass is becoming established.

3.4 DISPOSAL OF SOIL FROM PAVED SURFACES AND DUST CONTROL DEVICES
A. Soil excavated from temporary dust control structures shall be disposed on the site with general fill or with topsoil. Soil shall be allowed to dry out as required before reuse. Any trash shall be removed before reuse.

B. Contractor shall place the sediment removed from traps and other structures where it will not enter immediately reenter the device or paved area.

3.5 REMOVAL OF TEMPORARY DUST CONTROL MEASURES
A. Temporary control measures shall be removed once grading is completed and soils have stabilized.

3.6 RECORD KEEPING
A. Contractor shall keep accurate records as required by the SJVAPCD of dust control methods utilized during the course of construction. The Contractor shall utilize the forms provided by the SJVAPCD, included in the Appendix.

B. Contractor shall keep a copy of the approved DCP, any approved revisions, and all dust control records at the site.

C. Contractor shall furnish upon request by the Owner, Engineer, or SJVAPCD Inspector the approved DCP, approved revisions, and dust control records.

D. Contractor shall maintain dust control records for one year after project completion.
3.7 DUST CONTROL

A. The Contractor shall take whatever steps, procedures, or means as are required to limit dust generated by his operations during the Work, including Saturdays, Sundays, and Holidays. Dust shall be controlled to the standards of the local governing agency or, in the absence of local standards, to the satisfaction of the Engineer. Dust control shall extend to any unpaved road which the Contractor or any of his subcontractors are using, to excavation or fill areas, to demolition operations, and to other activities. Control shall be by sprinkling, use of dust palliatives, modification of operations, or any other means acceptable to the local governing agency or, in the absence of same, the Engineer.

B. If the dust control is not adequate in the opinion of the Engineer, this work may be done by others, and the cost shall be deducted from the total payment due the Contractor.

END OF SECTION
SECTION 01 57 50
CONSTRUCTION STAKES, LINES, AND GRADES

PART 1 GENERAL

1.1 LINES AND GRADE

A. The Work shall be executed in accordance with the lines and grades indicated in the Contract Documents. Distances and measurements, except elevations and structural dimensions, shall be made on horizontal planes.

1.2 OWNER’S SURVEY SERVICES

A. Construction surveying and staking for construction will be done by the Engineer or Engineer’s representative at the Owner’s expense. The Engineer will provide one set of stakes for the following:

1. Horizontal alignment of water mains at 100-foot intervals and at horizontal angle points or change in direction. Water main shall be installed at the minimum depth specified on the plans. No cut depths will be provided.

2. Water service locations will be staked based on the location shown on the plans. Two (2) stakes will be provided for each service. The Contractor is responsible for staking any services that change in location from that shown on the original plans.

3. Two (2) stakes will be provided for each water facility appurtenances, including: hydrants, blow-offs, air valves, RP devices, and bacteriological monitoring stations.

4. If Add Alternate No. 1 is awarded, one (1) set of stakes will be provided for the following at the Seville storage tank site:

a. Layout stakes for proposed facilities, including storage tank, booster pump pad, MCC concrete slab, hydro-pneumatic tank, and perimeter fencing.

b. Grade stakes for site grading and drainage pond.

B. Additional detail staking layout will be the responsibility of the Contractor.

C. The Contractor shall be responsible for preserving construction survey stakes, permanent survey monuments and bench marks for the duration of their usefulness. If any construction survey stakes permanent survey monuments or benchmarks are lost or disturbed and need to be replaced, such replacement shall be made by the Engineer at the expense of the Contractor.

D. The Contractor shall notify the Engineer at least three (3) working days before he will require survey services in connection with laying out of any portion of the
Work. The Contractor at his own expense shall dig all holes necessary for line and grade stakes prior to requesting survey services that depend on such digging.

E. The Contractor shall use the staking request for included in the Appendix.

END OF SECTION
PART 1 GENERAL

1.1 GENERAL

A. It is the intent of these Contract Documents that the Contractor shall deliver a complete and operable facility capable of performing its intended functions and ready for use.

1.2 CLEANING

A. Throughout the period of construction the Contractor shall keep the Work site free and clean of all rubbish and debris, and shall promptly remove from the site, or from property adjacent to the site of the Work, all unused and rejected materials, surplus earth, concrete, plaster, and debris, excepting select material which may be required for refilling or grading.

1.3 FINAL SITE CLEAN-UP

A. Upon completion of the Work, and prior to final acceptance, the Contractor shall remove from the vicinity of the Work all paint, surplus material, and equipment belonging to him or used under his direction during construction.

B. The Contractor shall restore to original condition all property not designated for alteration by these Contract Documents.

1.4 FINAL BUILDING CLEAN-UP

A. On all building projects and wherever else applicable, besides general broom cleaning, the following special cleaning shall be performed at completion of the Work:

1. Putty stains and paint shall be removed from glass; glass shall be washed and polished, inside and outside. Care shall be exercised so as not to scratch glass.

2. Marks, stains, fingerprints, and other soil and dirt shall be removed from painted, decorated, or stained work.

3. Waxed woodwork shall be cleaned and polished.

4. Hardware shall be cleaned and polished of all traces; this shall include removal of stains, dust, dirt, paints, and blemishes.

5. Spots, soil, paint, plaster, and concrete shall be removed from tile; tile work shall be washed afterwards.
6. Fixtures and equipment shall be cleaned and stains, paint, dirt, and dust shall be removed.

7. Temporary floor protection shall be removed; floors shall be cleaned, waxed, and buffed.

8. Dust, cobwebs, and traces of insects and dirt shall be removed.

1.5 WASTE DISPOSAL

A. The Contractor shall dispose of surplus materials, waste products, demolition materials, and debris. The Contractor shall transport and dispose of waste materials in accordance with applicable laws and regulations.

1.6 PROJECT RECORD DOCUMENTS

A. The Contractor shall maintain at the site, available to the Owner and Engineer, one copy of the Contract Documents, Drawings, Shop Drawings, Change Orders, and other modifications in good order and annotated to show all changes made during construction. These Documents shall be delivered to the Engineer for the Owner upon completion of the Work.

B. Record documents shall be reviewed during progress meetings to ascertain that all changes have been recorded.

C. Store Record Documents separate from documents used for construction.

1.7 TOUCH-UP AND REPAIR

A. The Contractor shall touch-up or repair finished surfaces on structures, equipment, fixtures, or installations that have been damaged prior to final acceptance. Surfaces on which such touch-up or repair cannot be successfully accomplished shall be completely refinished or in the case of hardware and similar small items, the item shall be replaced. Such items shall include, but not be limited to, the following:

1. Road surfaces
2. Exposed structure surfaces
3. Exposed equipment surfaces
4. Exposed piping surfaces

1.8 EQUIPMENT START-UP

A. After all acceptance tests have been completed by the Contractor and Owner but prior to final acceptance, the Contractor shall recheck all equipment for proper alignment and adjustment, check oil levels, re-lubricate all bearings and wearing points, and in general assure that all equipment is in proper condition for continuous operation.
1.9 **OPERATION AND MAINTENANCE (O&M) MANUALS**

A. See Section 01 33 00 – Submittal Procedures.

1.10 **FINAL EQUIPMENT CHECK**

A. After testing and before acceptance, all equipment shall be test run by the Owner for a minimum of 7 days to ensure proper operation. At the end of the test run each piece of machinery shall be lubricated and all components and couplings checked for proper alignment and adjustment.

B. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.

C. Provide submittals to the Owner required by other governing authorities.

1.11 **MANUFACTURER’S CERTIFICATES OF PROPER INSTALLATION**

1. The Contractor shall submit manufacturers' certificates of proper installation for all items of equipment.

**PART 2 PRODUCTS**

(Not Used)

**PART 3 EXECUTION**

(Not Used)
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END OF SECTION
SECTION 02 01 20

PROTECTING EXISTING UNDERGROUND UTILITIES

PART 1  GENERAL

1.1 UNDERGROUND FACILITIES

A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing underground facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such underground facilities, including Owner, or by others.

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. The cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. Reviewing and checking all such information and data,

   b. Locating all Underground Facilities shown or indicated in the Contract Documents,

   c. Coordination of the Work with the owners of such underground facilities, including Owner, during construction, and

   d. The safety and protection of all such underground facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated: If an underground facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated with reasonable accuracy in the Contract Documents, the provisions of Divisions 0 and 1 shall apply.

1. Contractor shall develop and execute a work-plan, subject to Engineer’s approval to protect underground facilities.

2. The Contractor shall expose, prior to staking and trenching, all existing utilities and existing facilities which may control proposed facility grades, and alignment. Two working days notice shall be given to the Engineer prior to commencing this work.

3. Full compensation for all costs involved in locating, verifying, protecting, exposing, and otherwise providing for utilities shall be included in the amounts bid for the various items of work, and no separate payment shall be made therefore.
1.2 PROTECTION

A. The Contractor shall not interrupt the service function or disturb the supporting base of any Utility by disrupting any facility identified in the Plans and Specifications without authority from the Owner or order from the Engineer. Where protection of such facilities is required to ensure support of utilities, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at the Contractor's expense.

B. The Contractor shall be prepared at all times with labor, equipment and materials to make repair on damaged mains or Utility facilities. The Contractor shall immediately notify the Engineer and the Utility owner if he disturbs, disconnects or damages any Utility. The Contractor shall bear the costs of repair or replacement of any Utility facility described with reasonable accuracy in the Plans and Specifications that is damaged by the Contractor. No extra compensation will be made for the repair of any services or mains damaged by the Contractor, nor for any damage incurred if the neglect or failure of providing protective barriers, lights and other devices or means required to protect such existing utilities or facilities described with reasonable accuracy in the Plans and Specifications.

1.3 SURVEY MARKERS AND PERMANENT REFERENCE POINTS

A. Surveying and Permanent Survey Markers

The Engineer will take measurements to assure the preservation of survey markers (monuments and bench marks). The Contractor shall not disturb permanent survey markers without the consent of Engineer and shall bear the expense of replacing any that may be disturbed without permission.

1. Replacement of survey markers shall be done only by the Engineer.

2. If disturbing of markers cannot be avoided, the Owner shall pay the cost of replacing said markers.

B. Lot Corner Monuments

The Contractor shall preserve property line and corner survey markers except where their destruction is unavoidable and the Contractor is proceeding in accordance with accepted practice. Markers that are lost or disturbed by his operations shall be replaced at the Contractor's expense by the Engineer.

END OF SECTION
SECTION 02 41 00

DEMOLITION

PART 1  GENERAL

1.1 DESCRIPTION

A. The work of this section consists of demolition and removal of pavements, slabs, miscellaneous debris, salvaged items, and portions of abandoned utilities.

B. This work may also include milling of asphaltic concrete.

C. Definitions:

1. Portland Cement Concrete: A mixture of Portland cement, fine aggregate, coarse aggregate, admixtures (if used) and water, proportioned and mixed. Also, included is rebar.

2. Asphalt Concrete: A mixture of liquid asphalt and graded aggregate used as paving material for roadways and parking lots.

1.2 WORK INCLUDED

A. Repair and restoration of areas damaged due to demolition work.

B. Salvaging of equipment for Owner.

C. Removal of demolished materials from site.

D. Remove existing piping and other existing structures as shown on the Plans to be removed.

E. Properly dispose of all removed materials.

F. Dewatering as needed in order to complete the proposed demolition.

G. Removal of trees and landscaping as required for construction.

1.3 RELATED WORK

A. Section 01 57 23 – Storm Water Pollution Prevention Plan

B. Section 01 57 27 – Dust Control

C. Section 03 30 00 – Cast-in-Place Concrete

D. Section 31 11 00 – Clearing and Grubbing
E. Section 31 23 00 – Earthwork.

1.4 SEQUENCING

A. Sequence work to minimize interference with water treatment facilities operation. The water plant must remain in operation until the end of the agricultural processing season. Prior to that time, work will be limited to mobilization, limited demolition, and exploratory digging to the extent that the plant can remain in operation.

1.5 REGULATORY REQUIREMENTS

A. Obtain required permits, as required.
B. Dispose of removed materials in an approved disposal or salvage facility.

1.6 REFERENCES

A. Section 16 – Clearing and Grubbing, State Standard Specifications
B. Section 19 – Earthwork, State Standard Specifications

1.7 SUBMITTALS

A. As specified in the General Conditions and Section 01 33 00 – Submittal Procedures.
B. Demolition plan including sequence of operations. The plan shall specifically address methods of demolition, schedule, sequence of demolition, and procedures for archeological monitoring. Demolition shall not proceed until the plan has been approved.

1.8 QUALITY ASSURANCE

A. General: Take all necessary precautions with regard to safety in carrying out the demolition and site work. Erect suitable barriers around open excavations and fulfill all appropriate requirements of CAL/OSHA. Comply with safety requirements for demolition, ANSI A10.6-90.

1.9 PROJECT CONDITIONS

A. Underground utilities exist at this site. Contractor shall take all necessary precautions to protect said utilities. Notify Engineer of any deviation in utility location from that which is shown on the drawings.
B. Keep dust to a minimum at removal site and on haul roads. Use sprinklers or water trucks as necessary or as directed by the Engineer.
C. Ensure safety of persons in demolition area. Provide temporary barricades as required.
D. Excavations may encounter groundwater and require dewatering depending on the time of year and amount of seasonal run-off. Loose sands exposed in excavation sidewalls may be unstable and require shoring or lying back in accordance with OSHA requirements. Flowing sands may also be encountered in excavations below groundwater levels.

1.10 CLOSEOUT SUBMITTALS
   A. As specified in the General Conditions and Section 01 77 00 – Contract Closeout
   B. Show all capped and abandoned utility terminations and location of remaining facilities on project Record Drawings.

PART 2 PRODUCTS

2.1 REPAIR AND RESTORATION MATERIALS
   A. Concrete shall be as specified in Section 03 33 00 – Cast-In-Place Concrete.
   B. Backfill materials shall be as required by Section 19 - Earthwork, State Standard Specifications.
   C. Asphalt and concrete shall match existing materials and conditions.
   D. Asphalt and concrete shall be replaced in conformance with governing authority standards.

2.2 MATERIALS
   A. Salvaged Materials: Materials to be salvaged shall remain the property of the Owner and shall be stockpiled as directed by the Engineer. Contractor shall inventory all salvaged materials. Stockpiled materials shall be free of hazardous substances. Salvage materials as specified on the plans.
   B. Items to be Salvaged and Relocated shall be salvaged and/or relocated as shown on the drawings, or as directed by the Engineer.
   C. Materials and items demolished and not designated for reuse, salvage or transfer to the Owner, as well as all debris, rubbish and other materials resulting from the demolition operations, shall become the property of the Contractor and shall be removed from the site within 48 hours of demolition.
   D. Storage or sale of the removed items will not be permitted at the site.
PART 3 EXECUTION

3.1 INSPECTION

A. Prior to demolition, inspect the site conditions, verifying all governing dimensions, notes and specification. Notify the Engineer of any errors or omissions in the contract documents.

B. Make such explorations and probes as are necessary to ascertain any required protection measures before proceeding with the demolition and removal work.

3.2 PREPARATION

A. Protect existing, appurtenances, structures, which are not to be demolished.

B. Prior to demolition work, all soil erosion control measures specified in Section 01 57 23 - Stormwater Pollution Prevention Plan (SWPPP) and inlet protection barriers shall be in place. Contractor shall provide appropriate measures to prohibit demolition debris and/or soil from entering any watercourse.

1. Protect all buildings, structures, utilities, and vegetation to remain.

3.3 DEMOLITION REQUIREMENTS

A. Conduct demolition to protect and minimize damage to structures and existing improvements.

B. Conduct salvaging to protect and minimize damage to salvaged equipment.

C. All work within a Caltrans right of way shall conform to Section 15 of the State Standard Specifications.

D. Execute the work in a careful, orderly and safe manner, with the least possible disturbance to the public. Cease operations immediately if adjacent work appears to be endangered. Do not resume operations until corrective measures have been taken.

E. Pavement and Slabs:

1. Remove completely all Portland cement concrete slabs-on-grade including, but not limited to, equipment pads, sidewalks, etc. If approved by the Engineer, the Contractor may crush Portland concrete for use as aggregate base.

2. Saw cut existing asphalt concrete pavements cleanly in straight continuous lines. Remove asphalt concrete pavement as shown on the drawings.

   a. Asphalt Concrete Milling Equipment: Milling machines shall be power operated, self-propelled machines capable of removing the desired thickness. They shall have sufficient power, traction and stability to accurately maintain depth of cut and slope.
3. Any material thus processed shall conform to the specifications for Section 32 11 23 - Aggregate Base.

4. In areas that are demolished, but where no future roads or structures are shown, the exposed subgrade shall be scarified an additional 18 inches before placing backfill.

F. Concrete and Masonry Structures: Remove structure to a minimum of 3 feet below grade. Break remaining portions to permit drainage. Remove completely if under proposed structures or roadways.

G. Items to be Salvaged: Remove as directed by the Engineer. Remove carefully. All salvaged material remains the property of the Owner. Store where directed by the Engineer.

H. Abandoned Utilities: Remove above ground utilities and terminate as approved by the utility company and the Engineer. Remove necessary portions of underground utilities to within 24 inches of excavation or final grade. Plug abandoned pipes and conduits with concrete plugs. Plugs shall be 6 inches or 2 times the pipe diameter in length, whichever is greater.

1. Water lines shall be capped as close as possible to active mains.

3.4 SALVAGE EQUIPMENT

A. Salvaged equipment shall be delivered to the Owner at a designated site within the project site. Salvaged equipment shall be placed on wood or concrete blocks so the equipment will be 4 inches minimum above ground elevation.

3.5 ORDER OF WORK

A. Existing facilities shall remain in operation until the new water system is in operation. Coordination will be required with the Owner for temporary shut-off of existing pipeline system for connection of new pipeline to existing pipelines and new chlorination connection. Contractor shall submit plans to Owner for approval for shut-off duration at least 10 business days prior to shut-off.

1. Hours and duration of shut-off will be limited to a maximum of 4 hours in any single day.

3.6 PRESERVATION

A. If indicated or required, preserve trees, plants, rock outcroppings, or other features designated to remain. Protect trees and plants from damage; fell trees in a manner which shall not injure standing trees, plants and improvements which are to be preserved.
3.7 RESTORATION

A. All demolition areas, staging/stockpiling, and open excavations shall be filled in accordance with the Earthwork Sections. Fill all open excavations deeper than one foot to an elevation to match the surrounding topography.

   1. New Construction Areas: As shown on drawings.

3.8 DISPOSAL

A. As specified in Section 01 50 00 – Temporary Facilities.

END OF SECTION
SECTION 03 15 00

CONCRETE ACCESSORIES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Furnish all materials, supplies, and performing all labor to furnish and install concrete accessories as described in this section of the Specifications, shown on the Plans. The work shall include, but is not necessarily limited to

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   3. D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
   5. D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
   7. D792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
   8. D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

B. U. S. Army Corps of Engineers (USACE):
   1. CRD-C-572, Specification for Polyvinyl Chloride Waterstop.

1.3 RELATED WORK

A. Section 03 30 00 – Cast-in-Place Concrete
1.4 SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

B. Product Data:
   1. Waterstops and Preformed Expansion Joint Material: Sufficient information on each type of material for review to determine conformance of material to requirements specified.

C. Samples: Provide samples of each product to be supplied under this section.

D. Manufacturer’s Installation Instructions: For all materials specified under this section.

E. Quality Control Submittals:
   1. Certificates of Compliance:
      a. Written certificates that waterstops and Preformed Expansion Joint Material supplied meet or exceed physical property requirements of this section.

1.5 QUALITY ASSURANCE

A. Mock-Ups:
   1. 1. Welding Demonstration:
      a. Demonstrate ability to weld acceptable joints in polyvinyl chloride waterstop before installation of waterstop begins.

B. Field Joints:
   1. Polyvinyl Chloride Waterstop Field Joints: Shall be free of misalignment, bubbles, inadequate bond, porosity, cracks, offsets and other defects which would reduce the potential resistance of the material to water pressure at any point. Replace defective joints, remove faulty material from the site.

C. Inspections:
   1. Quality of welded joints will be subject to acceptance of the Engineer.
   2. Polyvinyl Chloride Waterstop: The following defects that represent a partial list that will be grounds for rejection.
      a. Any combination of offset or crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16-inch or 15 percent of the material thickness, at any point, whichever is less.
      b. Misalignment of the joint, which will result in misalignment of the waterstop in excess of 1/2-inch in 10 feet.
c. Porosity in the welded joint as evidenced by visual inspection.

d. Bubbles or inadequate bonding.

**PART 2 PRODUCTS**

2.1 **MANUFACTURED UNITS**

A. Waterstops:

1. Polyvinyl Chloride Waterstops:

   a. One of the following or Engineer approved equivalent:

      1) Vinylex Corporation, Kwik-Tie.
      2) Greenstreak Plastic Products Company, Inc.

   b. Type: Ribbed Waterstop. Unless otherwise specified, joints shall be constructed as follows:

      1) Construction Joints: ribbed type, width to be 6 inches unless otherwise specified or shown on the plans, without center bulb.
      2) Expansion Joints: ribbed type, width to be 6 inches unless otherwise specified or shown on the plans, with hollow center bulb.

   c. Provide polyvinyl chloride waterstops complying with following requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Required Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water absorption</td>
<td>ASTM D 570</td>
<td>0.15% max</td>
</tr>
<tr>
<td>Tear Resistance</td>
<td>ASTM D 624</td>
<td>200 lb/in (35 kN/m) min.</td>
</tr>
<tr>
<td>Ultimate Elongation</td>
<td>ASTM D 638</td>
<td>350% min.</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>ASTM D 638</td>
<td>2000 psi (13.78 Mpa) min.</td>
</tr>
<tr>
<td>Low Temperature Brittleness</td>
<td>ASTM D 746</td>
<td>No Failure @ -35° F (-37° C)</td>
</tr>
<tr>
<td>Stiffness in Flexure</td>
<td>ASTM D 747</td>
<td>600 psi (4.13 Mpa) min.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>ASTM D 792</td>
<td>1.45 max.</td>
</tr>
<tr>
<td>Hardness, Shore A</td>
<td>ASTM D 2240</td>
<td>79 +3</td>
</tr>
<tr>
<td>Tensile Strength after</td>
<td>CRD-C 572</td>
<td>1850 psi (11.03 Mpa) min.</td>
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<tr>
<td>accelerated extraction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elongation after accelerated</td>
<td>CRD-C 572</td>
<td>300% min.</td>
</tr>
<tr>
<td>extraction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect of Alkalis after 7 days:</td>
<td>CRD-C 572</td>
<td>between -0.10% / +0.25%</td>
</tr>
<tr>
<td>Weight Change</td>
<td></td>
<td>+/- 5 points</td>
</tr>
<tr>
<td>Hardness Change</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Hydrophilic waterstop
County of Tulare  
Water System Improvements for Yettem & Seville

a. One of the following or Engineer approved equivalent:
   1) W. R. Grace and Company, Adcor ES
   2) Greenstreak Plastic Products Company, Inc., Hydrotite

b. Performance Requirements as follows:

<table>
<thead>
<tr>
<th>Chloroprene Rubber</th>
<th>Property</th>
<th>Test Method</th>
<th>Required Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tensile Strength</td>
<td>ASTM D 412</td>
<td>1300 PSI min.</td>
</tr>
<tr>
<td></td>
<td>Ultimate Elongation</td>
<td>ASTM D 412</td>
<td>400% min.</td>
</tr>
<tr>
<td></td>
<td>Hardness (Shore A)</td>
<td>ASTM D 2240</td>
<td>50 +/- 5</td>
</tr>
<tr>
<td></td>
<td>Tear Resistance</td>
<td>ASTM D 624</td>
<td>100 lb/inch min.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modified Chloroprene (Hydrophilic) Rubber</th>
<th>Property</th>
<th>Test Method</th>
<th>Required Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tensile Strength</td>
<td>ASTM D 412</td>
<td>350 PSI min.</td>
</tr>
<tr>
<td></td>
<td>Ultimate Elongation</td>
<td>ASTM D 412</td>
<td>600% min.</td>
</tr>
<tr>
<td></td>
<td>Hardness (Shore A)</td>
<td>ASTM D 2240</td>
<td>52 +/- 5</td>
</tr>
<tr>
<td></td>
<td>Tear Resistance</td>
<td>ASTM D 624</td>
<td>50 lb/inch</td>
</tr>
<tr>
<td></td>
<td>Expansion Ratio</td>
<td>Volumetric</td>
<td>3 to 1 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change - Distilled Water @ 70° F</td>
<td></td>
</tr>
</tbody>
</table>

3. Bentonite Strip Waterstop
a. One of the following or Engineer approved equivalent:
   1) Cetco, Waterstop, RX.
   2) Green Streak, Swell Stop

B. Preformed Expansion Joint Materials:
1. Preformed Synthetic Sponge Rubber Expansion Joint Material:
   a. Manufacturers: One of the following or Engineer approved equivalent:
      1) JD Russell Co, Reflex
      2) W.R. Meadows, Sponge Rubber Expansion Joint

2. Preformed Bituminous Fiber Expansion Joint Material:
   a. Conform to ASTM D994, preformed bituminous type, 1/2-inch thick
   b. Manufacturers: One of the following or Engineer approved equivalent:
      1) JD Russell Co., Fiberflex
2) W.R. Meadows, Fiber Expansion Joint

2.2 ACCESSORIES

A. Adhesives and sealants:
   1. Provide as recommended by product supplier.

PART 3 EXECUTION

3.1 INSTALLATION

A. Waterstops - General:
   1. Waterstops shall be stored so as to permit free circulation of air around the waterstop material and to prevent direct exposure to sunlight.
   2. Install waterstops in concrete joints where indicated on the Drawings.
   3. Carry waterstops in walls into lower slabs and join to waterstops in slabs with appropriate types of fittings.
   4. In Water bearing Structures: Provide all joints with waterstops, whether indicated on the Drawings or not.
   5. Provide waterstops that are continuous.
   6. Set waterstops accurately to position and line as indicated on the Drawings.
   7. Hold and securely fix edges in position at intervals of not more than 24-inches so that they do not move during placing of concrete.
   8. Position the waterstop so that the center axis of the waterstop shall be coincident with the centerline of the joint, unless detailed otherwise.
   9. Do not drive nails, screws, or other fasteners through waterstops in vicinity of construction joints.
   10. Secure waterstop against movement at not more than 24-inches on centers.
   11. Terminate waterstops 3-inches from top of finish surfaces of walls and slabs unless otherwise specified or indicated on the Drawings.
   12. When any waterstop is installed in the concrete on one side of a joint, while the other half or portion of the waterstop remains exposed to the atmosphere for more than two days, suitable precautions shall be taken to shade and protect the exposed waterstop from direct rays of sunlight during the entire exposure and until the exposed portion is embedded in concrete.
   13. Use specific type in applications as indicated on the Drawings.
14. No scrap or recycled material shall be used.

B. Polyvinyl Chloride Waterstops:
   1. Install waterstops so that joints are watertight.
   2. Weld joints such as unions, crosses, ells, and tees, with thermostatically controlled equipment recommended by waterstop manufacturer.
      a. The material shall not be damaged by heat sealing.
      b. Make joints by overlapping then simultaneously cut the ends of the sections to be spliced so they will form a smooth even joint.
      c. The continuity of the waterstop ribs and tubular center axis shall be maintained.
      d. The splices shall have a tensile strength of not less than 60 percent of the unspliced materials tensile strength.
   3. Butt joints of the ends of two identical waterstop sections may be made while the material is in the forms.
   4. All joints with waterstops involving more than two ends to be joined together, and all joints that involve an angle cut, alignment change, or the joining of two dissimilar waterstop sections shall be prefabricated prior to placement in the forms, providing not less than 24-inch long strips of waterstop material beyond the joint.
   5. Vertical crosses and tees shall be prefabricated by the manufacturer. Horizontal crosses or tees may be field or factory welded.
   6. Split type waterstop will not be permitted except where specifically indicated on the Plans.

C. Hydrophilic Waterstops
   1. Apply adhesive recommended by the manufacturer for the given application.
   2. Cut coil ends square or at proper angle for mitered corners with a sharp blade to fit splices together without overlaps.
   3. Splices and exposed cells shall be sealed using adhesives recommended by the manufacturer.
   4. Provide minimum concrete cover per manufacturer’s recommendations and in no instance less than 2 inches.
   5. Surfaces shall be even, smooth, clean and dry.
6. Do not use when the head exceeds 150’

D. Bentonite Waterstops

1. Apply adhesive recommended by the manufacturer for the given application.

2. Maintain the minimum clear cover recommended by the manufacturer but in no instance less than 2 inches.

3. Butt splice by pressing ends together to ensure no separation or air pockets. Do not overlap the ends of the waterstops.

4. Remove release paper immediately prior to the second concrete pour.

5. Replace waterstop showing signs of premature swelling, discontinuity or debris contamination.

E. Preformed Expansion Joint Material:

1. Fasten expansion joint strips to concrete, masonry, or forms with adhesive. No nailing will be permitted, nor shall expansion joint strips be placed without fastening.

2. Install expansion joint filler in accordance with manufacturer’s instructions.

3. Install joint filler ½ inch (13 mm) below the concrete surface.

4. Prior to sealing, slide expansion joint cap over the expansion joint.

5. Place concrete and screed to finish grade, allow adequate during time before removing top of expansion joint cap. Pull cap free and discard.

6. Seal with joint sealant.

F. Joints:

1. Install construction and expansion joints as indicated on the Plans.
County of Tulare
Water System Improvements for Yettem & Seville

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END OF SECTION
SECTION 03 15 20
ANCHOR BOLTS AND POST-INSTALLED ANCHORS

PART 1 GENERAL

1.1 WORK INCLUDED

A. The work of this section consists of furnishing and installing all materials and equipment and providing all labor necessary to complete the work shown on the drawings and/or listed below and all other work and miscellaneous items not specifically mentioned but reasonably inferred for a complete installation, including all accessories and appurtenances required for a completed system.

B. Cast-in-Place anchor bolts, anchor bolts and threaded rod anchors for epoxy grouting.

C. Expansion anchors to be installed in hardened concrete.

1.2 RELATED WORK

A. Section 03 30 00 – Cast In Place Concrete

B. Section 03 60 00 - Grout

C. Section 05 50 00 – Fabricated Metal

D. Section 05 12 00 – Structural Steel & Misc. Metals

1.3 SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

1.4 GENERAL

A. Unless otherwise specified or indicated on the drawings, all anchor bolts shall be cast-in-place bolts, shall have a diameter of at least 3/4 inch, and shall be headed and shall include a square washer a minimum of 1/4 inch thick and 2 inches square.

B. Expansion anchors and threaded rod anchors indicated or accepted in lieu of cast-in-place anchor bolts for equipment or structural framing shall have a diameter of at least 3/4 inch and shall be ICBO Evaluation Report listed.

1. Unless otherwise specified or indicated on the drawings, or approved by the Engineer, all other expansion anchors shall have a diameter of at least 1/2 inch.
PART 2 MATERIALS

2.1 MATERIALS

A. Nuts and washers for anchor bolts and expansion anchors shall be the same material as the bolts or anchors they are used with.

<table>
<thead>
<tr>
<th>Application</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Anchor Bolts and Nuts</td>
<td></td>
</tr>
<tr>
<td>1. Carbon Steel</td>
<td>ASTM A307</td>
</tr>
<tr>
<td>2. Stainless Steel</td>
<td>IFI-104, Grade 304 or 316</td>
</tr>
<tr>
<td>B. Threaded Rod Anchors and Nuts</td>
<td></td>
</tr>
<tr>
<td>1. Carbon Steel</td>
<td>ASTM A307 or A36</td>
</tr>
<tr>
<td>2. Stainless Steel</td>
<td>IFI-104, Grade 304 or 316</td>
</tr>
<tr>
<td>C. Flat Washers</td>
<td>ANSI B18.22.1; of the same material as anchor bolts and nuts.</td>
</tr>
<tr>
<td>D. Expansion Anchors</td>
<td></td>
</tr>
<tr>
<td>1. For Concrete</td>
<td>Fed Spec FF-S-325; wedge type, Group II, Type 4, Class 1 or 2; self-drilling type, Group III, Type 1; or nondrilling type, Group VIII, Type 1 or 2; Hilti ICBO #3987 or 4627, ITW Ramset/Red Head ICBO #2391, Rawl Bolt ICBO #4514, or ICBO approved equivalent.</td>
</tr>
</tbody>
</table>

B. Anchor bolts and threaded rod anchors for buried service and in splash zones shall be stainless steel. Anchor bolts, threaded rod anchors, and expansion anchors for immersion service shall be stainless steel. Expansion anchors for buried service and in splash zones shall be stainless steel. All other anchor bolts, threaded rod anchors, and expansion anchors shall be galvanized steel unless otherwise specified or indicated on the Plans.

PART 3 EXECUTION

3.1 ANCHOR BOLTS

A. Anchor bolts shall be delivered in time to permit setting before the structural concrete is placed. Anchor bolts which are cast in place in concrete shall be provided with sufficient threads to permit a nut to be installed on the concrete side of the concrete form or supporting template.

B. Anchor bolts and threaded rod anchors which are to be epoxy grouted shall be clean and free of coatings that would weaken the bond with epoxy.
C. Two nuts, a jam nut, and a washer shall be furnished for anchor bolts and threaded rod anchors indicated on the drawings to have locknuts; two nuts and a washer shall be furnished for all other anchor bolts.

D. Anti-seize thread lubricant shall be liberally applied to projecting, threaded portions of stainless steel anchor bolts and threaded rod anchors immediately before final installation and tightening of the nuts.

3.2 EXPANSION ANCHORS

A. Expansion anchors shall be installed in conformity with the manufacturer's instructions and ICBO Evaluation Report recommendations for maximum holding power, but in no case shall the depth of hold be less than four (4) bolt-hole diameters. The minimum distance between the center of any expansion anchor and an edge or exterior corner of concrete shall be at least four and one half (4-1/2) times the diameter of the hole in which the anchor is installed. Unless otherwise indicated on the Plans, the minimum distance between the centers of the expansion anchors shall be at least eight (8) times the diameter of the hole in which the anchors are installed.

B. Anti-seize thread lubricant shall be liberally applied to threaded stainless steel components immediately before assembly.
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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 WORK INCLUDED

A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to furnishing and installing concrete work as described in this section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom, except as hereinafter specifically excluded. The work shall include, but is not necessarily limited to:

1. All form work including special forms as required for any special construction and/or to accommodate the work of others and removal of forms.

2. All concrete reinforcement, placement, bending and forming thereof.

3. All concrete and cement finishing, all surface treatment and curing including non-slip finishes.

4. Installation of all reglets, bolts, anchors, cans, sleeves, column bolts, etc., whether furnished under this section or by others.

5. The furnishing of all items required to be or shown on the Plans as embedded in concrete, which are not specifically required under other sections.

6. Setting headers and screens finishing, curing, and protecting concrete.

B. Where prior inspection and test of materials are required, documentary evidence, in the form of test reports, shall be furnished prior to the time the material is incorporated into the work. All rejected material shall be promptly removed from the premises.

1.2 RELATED WORK

A. Division 31 – Earthwork

B. Division 32 – Exterior Improvements

C. Division 33 – Utilities

D. Section 05 50 00 – Fabricated Metal

E. Section 05 05 20 – Bolts, Washers, Anchors and Eyebolts

Cast-In-Place Concrete

03 30 00–1
F. Section 09 90 00 – Painting and Coating

1.3 REFERENCES

A. American Concrete Institute (ACI)
B. American Society for Testing and Materials (ASTM)
C. State Standard Specifications
D. California Building Code (CBC)

1.4 DEFECTIVE WORK

A. Work considered to be defective may be ordered, by the Engineer, to be replaced in which case the Contractor shall remove and replace the defective work at his expense. Work considered to be defective shall include, but not be limited to, the following:

1. Concrete incorrectly formed, or not conforming to details and dimensions on the Plans or with the intent of these documents, or concrete the surfaces of which are out of plumb or level.

2. Concrete in which defective or inadequate reinforcing steel has been placed.

3. Concrete containing wood, cloth, or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the Plans.

4. Concrete below specified strength.

5. As detailed in Section 63-1.05 of the State Standard Specifications.

1.5 SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

B. Provide material certificates, shop fabrication and placement drawings, and schedule for all reinforcing steel, embedded items, form release and curing compounds.

C. The Contractor shall provide a proposed concrete placement plan (to minimize the effects of cracking and differential settlement) to the Engineer, and gain approval of said plan, prior to ordering of reinforcing steel. As a minimum this plan shall contain the layout of horizontal and vertical construction joints, spaced no greater than 50 feet apart (unless specifically approved otherwise by the Engineer), and a pour schedule for the individual slab and wall pours. All construction joints shall be sized in conformance with the Typical Longitudinal Keys Detail and shall contain water stops as shown on the Construction Joint With Waterstop Detail.
PART 2 PRODUCTS

2.1 CONCRETE

A. Concrete shall conform to Section 90 of the State Standard Specifications. Unless otherwise shown or specified, all concrete shall contain not less than 611 pounds of Portland cement per cubic yard of concrete (6-1/2 sack) with a minimum 28-day compressive strength of 4500 psi.

1. Portland cement shall be Type II
2. Concrete shall contain 4% ±1% entrained air.
3. Water/cement ratio shall not exceed 0.45 (by weight).
4. Slump at placement shall be 4 inches.

B. Concrete used for thrust blocks shall contain not less than 517 pounds of Type II Portland Cement per cubic yard of concrete (5 1/2 sack).

C. Concrete used for pipe encasement shall contain not less than 517 pounds of Type II Portland Cement per cubic yard of concrete (5 1/2 sack).

D. Slurry cement backfill used in lieu of compacted soil shall contain not less than 188-pounds of Type II Portland Cement per cubic yard of concrete (2 sack) and shall comply with Section 19 of the State Standard Specifications.

2.2 AGGREGATE

A. Aggregate for normal weight concrete shall conform to ASTM C-33. Aggregates shall be free of dirt, clay balls, roots, bark and other deleterious substances and shall be thoroughly washed before use.

B. The combined aggregates for concrete shall conform to the grading limits for the one inch, maximum size specified in Section 90-1.02C(4)(d) of the State Standard Specifications, Combined Aggregate Gradings.

2.3 WATER

A. Water shall be clean and free from injurious amounts of acids, alkalis, salts, oils, organic materials or other deleterious substances.

2.4 FLYASH

A. Fly Ash: ASTM C618, Class F

1. Type of fly ash shall be compatible with the type of cement and the intended use of the concrete.

B. The combined weight of fly ash conforming to ASTM C618 shall not exceed 15 percent of the total cementitious material.
1. When substituting fly ash for cement, 1.5 pounds of fly ash shall be used in place of each pound of cement.

2.5 ADMIXTURES

A. Air Entraining: ASTM C260
B. Water Reducing: ASTM C494, Type A or D
C. Accelerating: ASTM C494, Type C or E
   1. No admixture containing any chloride ions is acceptable.
D. Retarding: ASTM C494, Type B or D

2.6 REINFORCING STEEL

A. Rebar shall be ASTM designation A615, Grade 60.
B. Welded wire fabric shall conform to ASTM A 1064.

2.7 EXPOSED-TO-VIEW CONCRETE

A. For exposed-to-view concrete, where legs of metal supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class I).
B. Metal bar supports in slab covers for sewage-containing structures shall also be provided with plastic coated legs.

2.8 FORM MATERIALS

A. Exposed Concrete: Plywood complying with U.S. Plywood Standard PS-1 “BB (Concrete Form) Plywood” Class I, or better.
B. Textured Finish Concrete: Units of face design, size arrangement and configuration to match control sample.
C. Cylindrical Columns and Supports: Metal, fiberglass or waxed paper tubes of sufficient wall thickness to resist imposed loads without deformation.
D. Form Release Agent shall leave behind a paintable concrete surface.
   1. Release #1, The Burke Co., or Engineer approved equivalent.

2.9 CURING MATERIALS

A. Polyethylene film
B. Reinforced waterproof paper
   1. Sisal Kraft, Orange Label, or approved equal.
County of Tulare
Water System Improvements for Yettem & Seville

C. Liquid-membrane curing compound
   1. Curing compound shall comply with ASTM C309, Type 2.
      a. White pigmented material
      b. Clear pigment may be used for concrete that will be exposed to public view.

2.10 WATERSTOP
   A. Comply with the provisions of Section 03 15 00 – Concrete Accessories.

PART 3 EXECUTION

3.1 REINFORCING STEEL
   A. Comply with CRSI, “Placing Reinforcing Bars” and as specified herein.
   B. Place reinforcing steel and embedded items in accordance with approved shop drawings.
   C. Splicing of bars shall be by lapping. Lapped splices shall be 45 bar diameters for bar size through #8 and 60 bar diameters for larger bars, unless otherwise shown on the Plans.
   D. Splicing of the wire fabric shall be by lapping. Lapped splices shall be two full mesh, minimum.
   E. All rebar in vertical walls shall be supported by concrete block spacers or metal chairs.
   F. Prior to placement of the concrete, reinforcing steel shall be cleaned and free of all concrete, dirt, oil, mill scale, rust or other coatings that would reduce or destroy the bond.
   G. All reinforcing steel and embedded items shall be reviewed and approved by the Engineer prior to concrete placement.

3.2 FORMS
   A. All forms shall be cleaned and an approved agent applied each time they are used and shall be so constructed and set as to resist, without springing or settlement, the pressure of the concrete and the placing operations.
   B. In designing forms and falsework, the concrete shall be treated as a liquid weighing at least 150 lbs. per cubic foot for vertical loads and not less than 85 lbs. per cubic foot for horizontal pressure. The design of the forms and falsework
system shall include allowances for temporary construction loads. The rate of placement of concrete shall be so regulated that the pressures caused by the wet concrete will not exceed the designed form pressure. The unsupported length of wooden columns and compression members shall not exceed 30 times the width of the least side.

C. All forms shall be set and maintained in true alignment, grade and section until the concrete has sufficiently set. The interior surfaces of forms shall be adequately treated with an acceptable material to insure non-adhesion of mortar. All forms shall be mortar-tight. When forms appear to be unsatisfactory in any way, concrete placement shall be stopped until the defects have been corrected.

D. All exposed outside corners, including the top edges of all walls, machinery bases and curbs shall have a ¾-inch chamfer.

E. Metal tie rods or anchorages within the forms shall be fitted with suitable cones or comparable devices. Metal tie rods or anchorages shall be removed to a depth of 1" from the surface without injury to the concrete. All fittings for metal ties shall be of such design that upon their removal, the cavities which are left will be of the smallest possible size, but of sufficient diameter to allow the cavity to be "dry packed" with cement mortar. The cavities shall be filled with cement mortar and the surface left sound, smooth and even.

F. Form release agent shall be applied to the form so that no agent comes in contact with reinforcing steel.

3.3 PLACING

A. All concrete shall be placed before it has taken its initial set and shall be placed in horizontal layers and in such a manner as to avoid segregation. The concrete adjacent to the forms and joints shall be thoroughly internal consolidated with a vibrator operating at not less than 4,500 vibrations per minute.

1. Pumping equipment shall be of suitable type, without Y-sections, and with adequate pumping capacity.

2. Loss of slump in pumping shall not exceed 1½ ".

3. Concrete shall not be placed through reinforcing that may cause separation of aggregates.

B. The concrete shall be deposited as nearly as possible in its final position. Drop chutes and elephant trunks shall be used on drops greater than 5 feet. Concrete shall be placed at such a rate that all concrete in the same lift will be deposited on plastic concrete. The concrete comprising each unit of work shall be placed in a continuous lift.

C. The Contractor shall notify the Engineer 24 hours (1 working day) prior to concrete placement.
1. The form work and reinforcing steel placement shall be approved by the Engineer prior to ordering concrete.

D. Form Removal. Minimum times for removal after concrete placement are as follows:

- Beam sides but not shoring: 3 days
- Column forms and wall forms: 2 days
- Forms for supported slabs but not shoring: 14 days

E. Construction Joints

1. At ends of the first concrete pour, provide forms that positively locate any waterstop. Ensure the end forms of walls are removable without releasing the side forms. Provide seals around reinforcement and water stop to prevent mortar leaks.

2. Overlap the hardened concrete of the first pour with forms for the second pour. Brace the ends of the forms against the hardened concrete to prevent joint offsets and mortar leakage. Align any exterior features required on the finished surface.

3.4 CONCRETE JOINTS

A. General

1. Provide joints:
   a. As shown on the Drawings and as noted below in these Specifications.
   b. As required for constructability
   c. After favorable review of layout, sequence and concrete placement program.

2. Provide minimum curing times before the second placement:
   a. 2 days after the first concrete placement at the joint.
   b. 10 days after each adjacent concrete placement, for infill pours or checkerboard placement pattern.

B. Control Joints:

1. Space typical control joints in slabs on grade or suspended slabs not exceeding 10 feet, or as shown on the Drawings. Control joints shall not be provided in water containment structures.
2. If cast-in with the concrete, positively locate the preformed joint filler and hold rigidly in place during concreting.

3. If saw-cut, use a wheeled power saw as soon as the concrete surface is firm enough. Saw-cut control joints must be constructed within 12-hours after concrete placement. Fill the groove with sealant over a backer rod.

C. Construction Joints:

1. Produce quality concrete, with full continuity of reinforcing and water tightness across the joints.

2. Space typical slab joints not exceeding 20 feet in the direction of the transverse or secondary reinforcing, typically the smaller reinforcing nearer to the center of the slab thickness. Space typical vertical wall joints no more than 30 feet apart.

3. Provide all joints in walls and slabs, retaining liquids, or earth with 6-inch waterstops. Continue all reinforcing through the joint unless otherwise noted.

4. After the first concrete placement at the joint, do not walk on or disturb any reinforcing extending into the second placement area for at least 48 hours.

5. Before depositing new concrete on or against concrete that has hardened, clean and roughen the entire surface of the joint exposing clean coarse aggregate solidly embedded in mortar matrix. Provide typically 1/4-inch roughness or amplitude of the concrete surface measured from the top of the exposed aggregate to the bottom of pockets between stones.

6. Drench the prepared joint with clean water and remove prior to the concrete pour.

7. Cover horizontal wall joints and wall-to-slab joints with a minimum thickness of 2 inches and a maximum of 6 inches of the modified concrete mix, consisting of the designated concrete mix with one-half of the coarse aggregate removed.

8. Use special care in vibrating adjacent to construction joints to ensure thorough consolidation of the concrete around the waterstops and against the hardened portion of the joint. Additional hand tamping may be required.

9. For joints that are shown on architectural drawings as having a continuous reveal or recess, leave the wood form or pour strip used to create the reveal or recess in place or re-insert before roughening. Prevent the next concrete placement from filling the reveal or recess.

D. Expansion Joints

1. Stop all steel reinforcing clear of the joint at each side.
2. Provide 9-inch center bulb waterstop continuously around the joint in walls and slabs retaining liquids.

3. Prepare a smooth first concrete surface with all voids filled.

4. Provide preformed joint filler, securely fastened to the existing concrete as directed by the Manufacturer.

5. Install bond breaker and sealant after curing is completed and when directed.

E. Bonding to Pre-existing Concrete: Mechanically roughen the old surface to a 1/4-inch amplitude, as defined in construction joint paragraph above. Apply epoxy bonding material prior to concreting, as recommended by the manufacturer.

F. Waterstop

1. Restrict field splices to butt joints in straight runs. For PVC type, make by heat welding, using a splicing iron. For rubber, provide sleeve joints and glue. Follow the manufacturer's specifications.

2. Positively locate and support in the forms so that concrete may be placed, consolidated, and vibrated on both sides of the embedded portion without displacement of the waterstop and without causing voids in the concrete. Protect the outstanding portion from damage during the first concrete pour and clean and positively support prior to the second pour. Place, consolidate and vibrate the second pour without displacement of the waterstop and without causing voids in the concrete.

3.5 CONCRETE CURING

A. Exposed concrete surfaces shall be protected from premature drying by covering as soon as possible with canvas, plastic sheets with sealed joints, burlap, sand or other satisfactory materials and kept continuously moist; or, if the surfaces are not covered, they shall be kept continuously moist by flushing or sprinkling.

1. Curing shall continue for a period of not less than 7 days after placing the concrete. If curing compound is used, two (2) applications will be made for even coverage. Curing methods must be approved by the Engineer.

3.6 FINISHING

A. Defective and honeycombed surfaces shall be chipped back to such a depth to expose solid concrete. The surface shall be dampened and coated with a bonding agent and packed with mortar.

B. Concrete Finishes for Vertical Wall Surfaces:

1. Form facing material shall produce a smooth, hard, uniform texture.
a. Use forms specified for surfaces exposed to view in accordance with the Plans and other Specification Sections.

2. At a minimum, repair the following surface defects:
   a. Tie holes
   b. Honeycombs deeper than ¼”
   c. Air pockets deeper than ¼”
   d. Rock holes deeper than ¼”
   e. Scabbing

3. Chip or rub off fins exceeding 1/8" in height.

4. Provide SF/ESF 3.0 finish and a smooth-rubbed finish for:
   a. Walls being waterproofed, painted, coated with some other material.
   b. Use at all exposed surfaces not specified to receive another finish.

C. Related Uniform Surfaces (Except Slabs):
   1. Strike smooth tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces after concrete is placed.
   2. Float surface to a texture consistent with that of formed surfaces.
   3. Continue treatment uniformly across unformed surfaces.

D. Concrete Finishes for Horizontal Slab Surfaces:
   1. General: Tamp concrete to force coarse aggregate down from surface. Screed with straightedgedge, eliminate high and low places, bring surface to required finish elevations; slope uniformly to drains. Dusting of surface with dry cement or sand during finishing processes not permitted.
   2. Slab Finish shall be as follows:
      a. Surfaces intended to receive damp proofing or water proofing membranes: Float finish.
      b. Floors intended to receive floor coverings and MCC rooms: Trowel finish.
      c. Sidewalks, garage floors, drive-throughs and ramps: Broom finish.
d. Exterior slabs, platforms, steps and landings, exterior and interior pedestrian ramps and interior stairs and all process equipment areas, not covered by other finish materials: Broom finish.

3. Deviation in finish surface shall not exceed ¼” in 10 ft.

4. No tolerance will be allowed that will result in the maximum running, or cross, slope exceeding the requirements of the Americans with Disabilities Act.

3.7 TESTING

A. Testing of concrete shall be as required by the Engineer and in accordance with ACI 301, Chapter 16.

1. All costs of initial testing will be paid by the Owner unless otherwise noted.

2. All costs involved, including those required by the Engineer, in retesting of concrete required because of a failure to meet these Specifications shall be at the expense of the Contractor.

3.8 WATERTIGHTNESS OF CONCRETE WORK

A. It is the intent of this Specification to obtain concrete and grout with homogenous structure, which when hardened will have the required strength, is watertight, and resistance to weathering.

3.9 HYDRAULIC TESTINGS OF STRUCTURES

A. It is the intent of this Specification to obtain concrete and grout with homogenous structure, which when hardened will have the required strength, watertightness, and resistance to weathering.

B. General: Test all concrete tanks, hydraulic channels, sumps, basins and other structures designed to contain water, after concrete has reached the design strength, prior to backfilling, and application of any coating system. Test shall be performed by filling the structure with water.

C. Preparation: Provide the following.

1. All water necessary for testing shall be of acceptable Quality.

2. All evaporation and level measuring devices required.

3. All pumps, power, piping and any other equipment required. Make all hook-ups necessary to fill tanks for testing.

4. The water disposal method after testing is complete, including pumping if necessary.
5. Fill the structure with water to the extreme high operating surface level or to overflow weir level. Furnish and install temporary bulkheads, if required.

6. Maintain full for 48 hours before beginning the test period to permit concrete absorption and adjustment of valves, slide gates, or temporary bulkheads.

7. At completion of tests remove all temporary piping and connections. Dispose of wastewater without creating a nuisance of damage to adjacent property.

D. Test Period: Five consecutive 24 hour periods totaling 5 consecutive days. Take daily measurements of air and water temperature, rainfall and water level.

E. Test Procedure:

1. After test period, measure water level at each side of the tank to determine leakage and loss from evaporation.

2. Determine evaporation loss, using a standard 48-inch evaporation pan and level measuring device located adjacent to the tank.

3. Mark all observed damp areas, running or dripping leaks on exposed surfaces that have not healed autogenously during the test. Damp areas includes areas if moisture can be transferred from the exterior surface to a dry hand. Repair all those areas.

4. If leakage from the structure exceeds that permitted for the types of mechanical equipment providing closure plus 0.075% of the storage capacity, in each 24-hour period over a period of five consecutive days, perform a retest after completing repairs.

5. Provide acceptable procedures prior to repairs. Repairs by painting or surface treatment will not be acceptable.

6. Continue the test and repair procedure until the structure satisfies both the leakage calculation requirement and the visible leakage requirement.

F. Test for Manholes

1. Furnish and dispose of water used for testing.

2. Hydraulically test all manholes installed.

3. After all pipe has been laid, backfilling has been completed, and after the testing of the pipes, plug the end of the pipe stubs in each manhole with flexible-joint caps, or acceptable alternate, securely fastened.

4. Fill the manhole with water and measure leakage over a period of not less than one hour.
5. Allowable Leakage: less than one (1) gallon per hour per 10-foot depth of manhole.

6. When leakage from the manhole exceeds the above amount, determine the source or sources of the leakage, and repair or replace defective materials and workmanship.

7. Repair all visible leaks even if manhole passes the leakage test.
SECTION 03 60 00
GROUT

PART 1 GENERAL

1.1 WORK INCLUDED

A. Epoxy grouting of anchor bolts and reinforcing bars to be installed in hardened concrete.
B. Adhesive bonding of fresh concrete to existing hardened concrete surfaces.
C. Installation of pipe and sleeve into existing concrete.
D. Structure and Equipment leveling pads.

1.2 RELATED WORK

A. Section 03 15 20 - Anchor Bolts & Post-Installed Anchors
B. Section 03 30 00 - Cast-in-Place Concrete

1.3 SUBMITTALS

A. As specified in the General Conditions and Section 01 33 00 – Submittal Procedures.

PART 2 PRODUCTS

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Approved Product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sauereisen Cements &quot;F-100 Level Fill Grout&quot;, U.S. Grout &quot;Five Star Grout&quot;, UPCO &quot;Upcon High Flow&quot; or &quot;Upcon Super Flow&quot;, or equal.</td>
</tr>
<tr>
<td>2. Epoxy Grout</td>
<td></td>
</tr>
<tr>
<td>a. Adhesive, Moisture insensitive</td>
<td>Adhesive Engineering &quot;Concressive 1539&quot;, Rescon &quot;Concrete Bonder R616&quot;, or equal</td>
</tr>
<tr>
<td>b. Aggregate</td>
<td>As recommended by the epoxy grout manufacturer</td>
</tr>
<tr>
<td>3. Epoxy Bonding Adhesive</td>
<td>Sikadur 32, Hi-Mod Master Builders Concresive Standard Liquid or equal.</td>
</tr>
<tr>
<td>4. Water</td>
<td>Clean and free from deleterious substances.</td>
</tr>
</tbody>
</table>
A. Non-shrinking grout shall be furnished factory premixed, so only water is added at jobsite. Grout shall be mixed in a mechanical mixer. No more water shall be used than is necessary to produce a flowable grout.

1. Cured grout shall have a minimum compressive strength of 3500 psi.

B. Epoxy grout shall consist of a two component liquid epoxy adhesive of appropriate viscosity for the application and location and an inert aggregate filler component. Components shall be packaged separately at the factory and field mixed. All proportioning and mixing of the components shall be in accordance with the manufacturer's recommendations.

1. Cured grout shall have a minimum compressive strength of 3500 psi.

PART 3 EXECUTION

3.1 PREPARATION

A. The concrete surface to receive non-shrinking grout shall be saturated with water for 24 hours prior to grouting.

B. Where indicated on the drawings, dowels shall be epoxy grouted in holes drilled into hardened concrete. Hole diameter shall be as recommended by the manufacturer. The embedment depth for epoxy grouted dowels shall be as indicated on the Plans.

C. Holes shall be prepared for grouting as recommended by the grout manufacturer.

D. The existing concrete surface to receive fresh concrete shall be clean and sound. The existing surface may be dry or damp, but free of standing water, free of dust, laitance, grease, airing compounds, and disintegrated materials. The existing concrete surface and rebar shall be sand blasted or cleaned by approved mechanical methods.

3.2 INSTALLATION

A. Non-shrinking Grout

1. Placement - Unless otherwise specified or indicated on the Plans, the thickness of grout shall be 1-1/2 inches. Grout shall be placed in strict accordance with the directions of the manufacturer.

2. Edge Finishing - The grout shall be finished smooth in all locations where the edge of the grout will be exposed to view after it has reached its initial set. Except where indicated to be finished on a slope, the edges of grout shall be cut off flush at the base plate, bedplate, member, or piece of equipment.
3. Curing – Non-shrinking grout shall be protected against rapid loss of moisture by covering with wet rags or polyethylene sheets. After edge finishing is complete, the grout shall be wet cured for at least 7 days.

4. Epoxy Grout - Dowels shall be clean, dry, and free of grease and other foreign matter at time of installation. The bars shall be set and positioned and the epoxy grout shall be placed and finished in accordance with the recommendations of the grout manufacturer. Particular care shall be taken to ensure that all spaces and cavities are filled with epoxy grout, without voids.

B. Epoxy Bonding Adhesive: Pre-mix each component as specified by manufacturer. Mix only that quantity that can be applied within its pot life. Apply as specified by manufacturer.
SECTION 05 05 20

BOLTS, WASHERS, ANCHORS AND EYEBOLTS

PART 1  GENERAL

1.1 WORK INCLUDED

A. This section describes materials and installation of anchor bolts, connecting bolts, washers, drilled anchors, epoxy anchors, screw anchors, eyebolts, and stainless steel fasteners.

1.2 DESIGN CRITERIA

A. Structural Connections: AISC Specification for Structural Steel Buildings (June 22, 2010), except connection details are shown in the Drawings.

1.3 REFERENCES

A. American Institute of Steel Construction (AISC)
B. American Society for Testing and Materials (ASTM)
C. Research Council on Structural Connections (RCSC)

1.4 SUBMITTALS

A. Submit shop drawings in accordance with the General Conditions and Section 01 33 00 – Submittals.

B. Submit manufacturer's catalog data and ICC Evaluation Service Reports for bolts, washers, and concrete anchors. Show dimensions and reference materials of construction by ASTM designation and grade.

C. Submit anchor bolt layout drawings.

PART 2  PRODUCTS

2.1 GENERAL

A. Anchor bolts, drilled anchors and epoxy anchors for buried service, immersion service and in splash zones shall be stainless steel. All other anchor bolts, drilled anchors and epoxy anchors shall be galvanized steel unless otherwise specified on the Plans.
2.2 ANCHOR BOLTS

A. Steel anchor bolts shall conform to ASTM F1554, Grade 36, Class 1A or 2A unless otherwise indicated. Size, length and thread length shall be as shown on the Drawings.

B. Bolts shall be provided with a head and two washers of a minimum of ¼ inch thick and 2 inches square. One washer shall be embedded in the concrete at the head of the bolt.

C. Anchor bolts, nuts and washers shall be galvanized per ASTM F2329.

2.3 CONNECTION BOLTS

A. Steel connection bolts shall conform to ASTM A325, Type 1 with the threads included in the shear plane.

B. Provide galvanized bolts where shown in Drawings. Galvanizing of bolts, nuts, and washers shall be in accordance with ASTM F2329.

2.4 STAINLESS STEEL BOLTS

A. Stainless steel bolts shall be ASTM A193, Grade B8 or ASTM F593, Type 316. Nuts shall be ASTM A194, Grade 316 or ASTM F594, Type 316. Use ASTM A194 nuts with ASTM A193 bolts; use ASTM F594 nuts with ASTM F593 bolts. Provide washer for each nut and bolt head. Washers shall be of the same material as the nuts.

2.5 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

A. Lubricant shall be chloride free and shall be RAMCO TG-50, Anti-Seize by RAMCO, Huskey™ Lube-O-Seal by HUSK-ITT Corporation, or equal.

2.6 WASHERS

A. Washers for bolts conforming to ASTM F1554 shall conform to ASTM F436, Type 1.

B. Washers for bolts conforming to ASTM A307 shall conform to ASTM F844.

C. Washers for bolts conforming to ASTM A325 shall be square or rectangular, tapered in thickness, smooth, hot-dipped galvanized, conforming to ASTM F436.

D. Stainless steel washers shall be Type 316.

2.7 DRILLED ANCHORS

A. Unless otherwise indicated in the Drawings, drilled anchors shall be 316 stainless steel wedge anchors as manufactured by ITW Red Head Trubolt+, Kwik Bolt TZ by Hilti, or equal. Anchors shall have ICC-approved testing.
2.8 EPOXY ANCHORS

A. Epoxy anchors in concrete shall be 316 stainless steel threaded rod adhesive anchors. Adhesive shall be ITW Red Head Epcon S7, Hilti HIT RE 500-SD, or equal. Epoxy anchor assemblies shall be ICC approved.

B. Epoxy anchors in grouted concrete masonry walls shall be 316 stainless threaded rods. Epoxy adhesive shall be Hilti HIT HY 70, Simpson ET-HP, or equal.

PART 3 EXECUTION

3.1 STORAGE OF MATERIALS

A. Store material, either plain or fabricated, above ground on platforms, skids, or other supports. Keep material free from dirt, grease, and other foreign matter and protect from corrosion.

3.2 GALVANIZING

A. Zinc coating for bolts, anchor bolts, and threaded parts shall be in accordance with ASTM F2329.

3.3 INSTALLING CONNECTION BOLTS

A. Use steel bolts to connect structural steel members. Use stainless steel bolts to connect structural aluminum members.

B. Install ASTM A325 bolts and washers per the RCSC "Specification for Structural Joints Using High Strength Bolts".

C. Bolt holes in structural members shall be 1/16 inch in diameter larger than bolt size. Measure cast-in-place bolt locations in the field before drilling companion holes in structural steel beam or assembly.

D. Slotted holes, if required in the Drawings, shall conform to AISC 360-10, Chapter J, Section J3, Table J3.3.

E. Drive bolts accurately into the holes without damaging the thread. Protect bolt heads from damage during driving. Bolt heads and nuts or washers shall rest squarely against the metal. Where bolts are to be used on beveled surfaces having slopes greater than 1 in 20 with a plane normal to the bolt axis, provide beveled washers to give full bearing to the head or nut. Where self-locking nuts are not furnished, bolt threads shall be upset to prevent the nuts from backing off.

F. Bolts shall be of the length that will extend entirely through but not more than 1/4 inch beyond the nuts. Draw bolt heads and nuts tight against the work.
3.4 INSTALLATION OF STAINLESS STEEL BOLTS AND NUTS

A. Prior to assembly, coat threaded portions of stainless steel bolts and nuts with lubricant.

3.5 INSTALLING ANCHOR BOLTS

A. Anchor bolts shall be delivered in time to permit setting before the structural concrete is placed. Anchor bolts which are cast in place in concrete shall be provided with sufficient threads to permit a nut to be installed on the concrete side of the concrete form or supporting template.

B. Preset bolts and anchors by the use of templates. Do not use concrete anchors set in holes drilled in the concrete after the concrete is placed for mechanical equipment. Anchor bolts and threaded rod anchors which are to be epoxy grouted shall be clean and free of coatings that would weaken the bond with epoxy.

C. Two nuts, a jam nut, and a washer shall be furnished for anchor bolts and threaded rod anchors indicated on the drawings to have locknuts; two nuts and a washer shall be furnished for all other anchor bolts.

D. Anti-seize thread lubricant shall be liberally applied to projecting, threaded portions of stainless steel anchor bolts and threaded rod anchors immediately before final installation and tightening of the nuts.

E. For static items such as storage tanks, use preset anchor bolts or drilled anchors with ICC report data.

F. After anchor bolts have been embedded, protect projecting threads by applying grease and having the nuts installed until the time of installation of the equipment or metalwork.

3.6 INSTALLING DRILLED ANCHORS

A. Minimum depth of embedment of drilled mechanical anchors shall be as recommended by the manufacturer, but no less than that shown in the Drawings.

B. Prepare holes for drilled anchors in accordance with the anchor manufacturer’s recommendations prior to installation.

3.7 INSTALLING EXPOXY ANCHORS

A. Epoxy anchors shall be clean and free of coatings that would weaken the bond with epoxy.

B. Minimum depth of embedment of epoxy anchors shall be as recommended by the manufacturer, but no less than that shown in the Drawings.

C. Prepare holes for epoxy anchors in accordance with the anchor manufacturer’s recommendations prior to installation.

END OF SECTION
SECTION 05 12 00

STRUCTURAL STEEL AND MISCELLANEOUS METALS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Fabricated items from metal shapes, plates, sheets, rods, bars or castings, and other wrought or cast metals except component parts of equipment.

B. Structural steel shall include all structural members and fasteners.

C. Floor plates, and gratings.

D. Fabricated metal items that are indicated on the drawings but not mentioned specifically herein shall be fabricated in accordance with the applicable requirements of this section.

1.2 RELATED WORK

A. Section 03 15 20 - Anchor Bolts & Post-Installed Anchors

B. Section 03 30 00 - Cast-in-Place Concrete

C. Section 03 60 00 - Grout

D. Section 05 52 00 – Hand Railing & Ladders

E. Section 09 90 00 – Painting and Coating

1.3 REFERENCES

A. Except as modified herein, all work specified herein shall comply with the applicable requirements of the following standards:

1. Uniform Building Code

2. Aluminum Association

3. American Institute of Steel Construction

4. American Iron and Steel Institute

5. American National Standards Institute

6. American Society of Testing and Materials

7. American Welding Society


9. The applicable sections of OSHA code
1.4 SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

B. Complete assembly, installation drawings, detailed specifications and data covering materials used and accessories forming part of the furnished product shall be submitted.

C. All bolted connections and welds shall be properly identified on the detailed shop drawings.

D. Submittals for high strength bolts and load indicator washers shall include statements from the bolt and washer manufacturers certifying satisfactory compliance with the governing standards and the specified tests.

E. Welding procedures, welding procedure qualification records and welder qualifications shall be submitted as required.

1.5 INSPECTION AND TESTING

A. All costs for inspections and tests shall be coordinated and paid by the Contractor. Testing laboratory shall be selected by Contractor and approved by the Engineer.

B. Contractor shall schedule testing with the testing laboratory so that tests and shop inspections may be made in sufficient time for approvals to be given prior to fabrication.

1. Do not fabricate, use or deliver any steel to the site until it has been tested, or accompanied by a certificate of compliance issued by testing laboratory or by fabricator.

2. All welding shall be done by AWS certified welders approved by the Engineer.

3. Copies of all test reports shall be supplied to the Engineer.

1.6 TOLERANCES

A. For materials, fabrications and erection shall not exceed those tolerances as set forth in the "Code of Standard Practice, American Institute of Steel Construction", as adopted and revised to date.

1.7 CLEANING AND STRAIGHTENING

A. All material, before being fabricated, shall be thoroughly wire brushed, cleaned of all scale and rust, and shall be thoroughly straightened by methods that will not injure the material before being worked on. After punching or working the component parts of a riveted member, all twists or bends shall be removed before the parts are assembled. All finished members shall be free from twists, bends or open joints, when erected.
1.8 GAS CUTTING

A. Gas cutting shall be done by machine when possible. All re-entrant corners shall be shaped notch free to a radius of at least one-half inch.

1.9 QUALITY ASSURANCE

A. All welding procedures and operators for welding of steel and aluminum fabrications shall be qualified in accordance with the applicable provisions of AWS, and as set forth in the fasteners section.

1.10 DELIVERY, STORAGE AND HANDLING

A. Materials shall be handled, transported, and delivered in a manner which will prevent bends, dents, significant coating damage, or corrosion. Damaged materials shall be promptly replaced.

B. Structural and miscellaneous metals work shall be stored on blocking so that no metal touches the ground and water cannot collect thereon. The material shall be protected against bending under its own weight or superimposed loads.

PART 2 PRODUCTS

2.1 GENERAL

A. Structural and miscellaneous metal work shall be fabricated in conformity with dimensions, arrangements, sizes, and weights or thicknesses specified or indicated on the drawings.

2.2 STRUCTURAL STEEL

A. Steel

1. Shapes (except wide flange), Plates and Bars

2. Wide Flange Shapes

3. Sheets

4. Checkered Plate

5. Pipe

6. Bolts and Nuts

7. Bolts and Nuts, High Strength

8. Nuts, Heavy-Hex

9. Nuts, Self-Locking

10. Washers

a. Flat

b. Flat, Hardened

ASTM A36.

ASTM A992.

ASTM A366 OR A569, zinc coated.

ASTM A786 carbon steel, skid resistant pattern.

ASTM A120 OR A53, Type E or S, Grade B.

ASTM A307 (unfinished).

ASTM A325 Type 1

ASTM A563, compatible with bolts

Prevailing torque type; IFI-100, Grade A.

ANSI B18.22.1.

ASTM F436, Type 1.
County of Tulare
Water System Improvements for Yettem & Seville

c. Lock

ANSI B18.21.1, helical spring type.

11. Nuts, Self-Locking

Prevailing torque type; IFI-100, Grade A.

12. Threaded Rods

ASTM A36

13. Anchor Rods, Hooked or Threaded

ASTM F1554 Grade 55

B. Stainless Steel

1. Plates

ASTM A167, Type 304, or ASTM A240, Type 316L

2. Bolts and Nuts

IFI - 104, Grade 303, 304, or 305

3. Washers

a. Flat

ANSI B18.22.1 Type 316

b. Lock

ANSI B18.21.1, helical spring type, Type 316

C. Shop Coatings

1. Rust-Inhibitive Primer

Universal type; Cook "391-N-167 Barrier Coat", Koppers "No. 10 Inhibitive Primer", Tnemec 77 Chem-Prime", or Valspar "13-R-28 Chromox Primer." Devoe "Devran 203"

2. Epoxy Paint

Ameron "Amerlock 400 High Solids Epoxy Coating", Carboline "Carboguard 891", Tnemec "Series N140", or Devoe "Bar Rust 235H"; & "Devflex 4208".

3. Coal Tar Paint

Koppers "Bitumastic Super Service Black", Tnemec "46-449 Heavy Duty Black", or Valspar "High-Build Bituminous Coating 35-J-10."

4. Galvanizing

ASTM A123, A153, A385

D. Except as otherwise specified or indicated on the drawings, all materials and work shall conform to the applicable provisions of the AISC "Steel Construction Manual" and AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".

E. When required, all fabricating plants providing structural steel under these specifications shall be certified in accordance with the AISC Quality Certification Program for the required certification category.

2.3 HIGH STRENGTH BOLTED CONNECTIONS.

A. Unless otherwise required, bolted connections for structural steel, as defined in the AISC manual, shall be made with ASTM A325 high strength bolts conforming to the "Specifications for Structural Joints Using ASTM A325 or A490 Bolts" as approved by the Research Council on Structural Connections. The method of installation, pre-tensioning procedures, and bolting equipment and tools shall likewise conform to the above referenced ASTM standard.

Structural Steel and Miscellaneous Metals
05 12 00–4
B. Bolt holes shall have a diameter nominally 1/16 inch larger than the nominal bolt
diameter. Bolt holes for one ply only of vertical diagonal bracing connections may
be oversized to a diameter nominally 3/16 inch larger than the nominal bolt
diameter. If oversized holes are provided in an outer ply, a hardened flat washer
shall be installed over each hole during bolting.

C. Beveled washers shall be used when the bearing faces of bolted parts have a
slope of 1:20 or greater with respect to a plane perpendicular to the bolt axis. Bolt
length shall be increased as needed to accommodate the beveled washers.

D. Except as otherwise required or specified herein, bolted connections shall be
bearing type with threads excluded from the shear plane. Slip critical connections
shall be used in diagonal bracing connections, where slip critical connections are
indicated on the drawings, or where oversize holes or slotted holes parallel to the
direction of the load are used.

PART 3 EXECUTION

3.1 WELDING

A. Welding and related operations shall conform to applicable provisions of the
Structural Welding Code, AWS D1.1, of the American Welding Society. All welding
shall be performed in accordance with written procedures, using only those joint
details which have prequalified status when performed in accordance with AWS
D1.1. All welding shall be performed by welders qualified in accordance with the
American Welding Society for steel welding and American Society for Mechanical
Engineers Section IX for stainless steel welding. Welding procedure
specifications qualification records, and welder qualification records shall be
submitted as required.

B. The welding shall be performed by AWS certified welders.

1. The operator, the welding equipment, the electrodes, the methods of
making the welds as completed shall be approved by the inspector of the
testing laboratory.

2. All welds shall be visibly inspected in accordance with AWS procedures.
Additional inspection or testing shall be performed as indicated on the
drawings.

C. Welds not dimensioned on the drawings shall be sized to develop the full strength
of the least strength component of the connection.

D. Where structural or miscellaneous steel connections are welded, all butt and miter
welds shall be continuous and, where exposed to view, shall be ground smooth.
Intermittent welds shall have an effective length of at least 2 inches and shall be
spaced not more than 6 inches apart.

E. Surfaces to be welded and surfaces adjacent (within 2 inches) of a weld shall be
free from loose or thick scale, slab, rust, moisture, grease, paint (except approved
weldable primers) and other foreign materials that would prevent proper welding or
release objectionable fumes.
F. Defective welds or unsatisfactory parts shall be cut out and replaced.

3.2 SURFACE COATING

A. Shop Painting

1. All structural steel not encased in concrete shall be thoroughly cleaned, wire brushed, removing all scale and given one heavy coat of paint as specified in Section 09 90 00 – Painting and Coating.

2. Structural steel parts not in contact, but inaccessible after assembly shall be painted with two coats before assembly as specified in Section 09 90 00 - Painting.

B. Field Painting

1. After erection, all parts where paint has been rubbed or burned off or where skips have occurred in shop painting, all field rivets, bolts and welded areas shall be painted as specified in Section 09900 – Painting and Coating.

3.3 INSTALLATION AND FIELD QUALITY CONTROL

A. All posts of railings shall be rigidly attached to concrete structures by approved anchors through railing post base plates. In any section, or run of railing, the center lines of all members shall be in true alignment lying in the same vertical frame.

B. After installation, railings shall be checked for final alignment, using a tightly drawn wire for reference. The maximum misalignment tolerance for railing shall be 1/8 inch in 12 feet. Bent, deformed or otherwise damaged railings shall be replaced.

3.4 ADJUSTING AND CLEANING

A. Items which have been given shop applied protective coatings that become damaged during erection or installation shall be repaired with the same or equivalent coating.

END OF SECTION
SECTION 05 50 00

FABRICATED METAL

PART 1  GENERAL

1.1 WORK INCLUDED

A. Provide metals work for hand railing and fencing, guard posts, bearing plates for pumps, and other miscellaneous metal works, complete as indicated, specified and required.

1. Steel channel and/or angle frames and thresholds with anchors
2. Handrails, stairs and grating
3. Pipe supports with saddles, hangers, bracing and attachments as detailed and required, except as provided by other trades
4. Guard post assemblies for removable and stationary types
5. Miscellaneous iron and steel items indicated, specified, or required for completion of the Work, unless included under other Sections of the Specification
6. Miscellaneous connections, anchors, bolts, clips, spacers, nuts, washers, shapes and inserts, as required
7. Galvanizing, shop primer finishes for work of this Section as specified or required, including field touchups.

1.2 RELATED WORK

A. Section 03 15 20 – Anchor Bolts and Post-Installed Anchors
B. Section 03 30 00 – Cast-In-Place Concrete
C. Section 09 90 00 – Painting and Coating

1.3 REFERENCES

A. Industry Codes and Standards
   American Institute of Steel Construction (AISC)
   Specification for the Design, Fabrication and Erection of Steel for Buildings
   Code of Standard Practice for Steel Buildings and Bridges
   American Society for Testing and Materials (ASTM)
   American Welding Society (AWS)
AWS D 1.1 Structural Welding Code Steel

B. Government Regulations

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA)

Cal/OSHA Standards

1.4 QUALITY ASSURANCE

A. Unless otherwise specified all work specified herein and shown on the Drawings shall conform to the applicable requirements of the following specifications and codes:


2. Inspections. Perform all field welding and field high strength bolting of structural steel assemblies under the inspection of the Engineer. Notify the Engineer at least 48 hours in advance of needed inspections. Provide copies of testing and inspection reports to the Engineer.

1.5 SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

1. Shop Drawings and Erection Drawings. Show materials and specification list, construction and fabrication details, layout and erection diagrams and method of anchorage to adjacent construction. Give location, type, size and extent of welding and bolted connections and clearly distinguish between shop and field connections. Coordinate shop drawings with related trades to ensure proper mating of assemblies.

a. Catalog work sheets showing illustrated cuts of item to be furnished, scale details and dimensions may be submitted for standard manufactured items.

b. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from Drawings. Where concrete, masonry or other materials must be set to exact locations to receive work, furnish assistance and direction necessary to permit other trades to properly locate their work. Where welded connectors, concrete, or masonry inserts are required to receive work, show on shop drawings exact locations required.

2. Shop Painting Data. Submit product list with product data sheets of intended shop coats. These products shall be compatible with the products and manufacturers with those systems Specified in Section 09 90 00 - Painting.
PART 2 PRODUCTS

2.1 MATERIALS – GENERAL

A. Provide materials that are new, sound and conforming to the following:

<table>
<thead>
<tr>
<th>Item</th>
<th>ASTM Standard No.</th>
<th>Class, Grade Type or Alloy No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast Iron</td>
<td>A 48</td>
<td>Class 40B</td>
</tr>
<tr>
<td>Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galvanized sheet iron or steel</td>
<td>A 653</td>
<td>Coating G90</td>
</tr>
<tr>
<td>Black steel, sheet or strip</td>
<td>A 569</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A 570</td>
<td></td>
</tr>
<tr>
<td>Coil (plate)</td>
<td>A 635</td>
<td></td>
</tr>
<tr>
<td>Structural plate, bars, rolled shapes, and miscellaneous items</td>
<td>A 36</td>
<td></td>
</tr>
<tr>
<td>items (except W shapes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolled W shapes</td>
<td>A 992</td>
<td>Grade 50</td>
</tr>
<tr>
<td>Standard bolts, nuts and washers</td>
<td>A 307</td>
<td></td>
</tr>
<tr>
<td>High strength bolts, nuts and hardened flat washers</td>
<td>A 325</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A 490</td>
<td></td>
</tr>
<tr>
<td>Eyebolts</td>
<td>A 489</td>
<td>Type 1</td>
</tr>
<tr>
<td>Tubing, cold-formed</td>
<td>A 500</td>
<td></td>
</tr>
<tr>
<td>Tubing, hot-formed</td>
<td>A 501</td>
<td></td>
</tr>
<tr>
<td>Steel pipe</td>
<td>A 53</td>
<td>Grade B</td>
</tr>
<tr>
<td>Stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plate, sheet and strip</td>
<td>A 240</td>
<td>Type 304* or 316**</td>
</tr>
<tr>
<td>Bars and shapes</td>
<td>A 276</td>
<td>Type 304* or 316**</td>
</tr>
<tr>
<td>Aluminum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flashing sheet aluminum</td>
<td>B 209</td>
<td>Alloy 5005-H-14, 0.032 inches minimum thickness</td>
</tr>
<tr>
<td>Structural sheet aluminum</td>
<td>B 209</td>
<td>Alloy 6061-T6</td>
</tr>
<tr>
<td>Structural aluminum</td>
<td>B 209</td>
<td>Alloy 6061-T6</td>
</tr>
<tr>
<td></td>
<td>B 308</td>
<td></td>
</tr>
<tr>
<td>Extruded aluminum</td>
<td>B 221</td>
<td>Alloy 6063-T42</td>
</tr>
</tbody>
</table>
*Use Type 304L if material will be welded                             |
**Use Type 316L if material will be welded                             |

1. Anchor bolts:
a. Anchorages for all locations unless otherwise indicated on Drawings: Stainless steel, Type 316, Hilti HVA adhesive anchors, or Engineer approved equivalent.

b. Chemical bond or adhesive type DBDs, if approved by the manufacturer and the Engineer, are acceptable for anchorage of vibrating machinery or equipment.

2. Expansion Anchors.

   a. Hilti Kwik-Bolt, Standard Type or Engineer approved equivalent.


   a. Iron and Steel. ASTM A123, with average weight per square foot of 2.0 ounces and not less than 1.8 ounces per square foot.

   b. Ferrous Metal Hardware Items. ASTM A153 with average coating weight of 1.3 ounces per sq. ft.

   c. Touch-up Material for Galvanized Coatings. Repair galvanized coatings marred or damaged during erection or fabrication by use of DRYGALV as manufactured by the American Solder and Flux Company, Galvalloy, Galvion, Rust-Oleum 7085 Cold Galvanizing Compound, or Engineer approved equivalent.


5. Shop Prime Paint. To assure compatibility with deferred field-applied paint or coating systems, for ferrous metals other than stainless steel, galvanized steel and cast iron, provide surface preparations and use shop prime paint product and manufacturer as painting or protective coating system intended for field application specified in Section 09 90 00 - Painting.

   a. Do not shop prime portions of work immediately adjacent to intended field welds, or portions intended for embedment.

PART 3 EXECUTION

3.1 GENERAL FABRICATION AND INSTALLATION REQUIREMENTS

   A. Standards: Thoroughly clean ferrous metals of all loose scale and rust before being fabricated. Provide finished members free of twists, bends or open joints, and that present a neat workmanlike appearance when completed. Perform steel work conforming to the best practices set forth in the “Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings” of the American Institute of Steel Construction.

B. Welding: Perform all welding in accordance with the “Structural Welding Code-Steel,” AWS D1.1.

1. Use only welders qualified by tests in accordance with AWS B 3.0.

C. General Fabrication and Installation

1. Using new stock of sizes specified or detailed, fabricate in shop producing high grade metal work. Form and fabricate to meet required conditions. Include clips, straps, bolts, screws, and other fastenings necessary to secure the work. Accurately make and tightly fit joining and intersections in true planes with adequate secure fastenings. Erect all metal work plumb, true on line and in its designated location. Grind and finish smooth field welds on exposed surface. Bolt or weld connections as indicated on Drawings. After installation, leave all work in a neat and clean condition, ready for field painting or coating.

   a. The maximum misalignment tolerance for railing shall be 1/8 inch in 12 feet. Bent, deformed or otherwise damaged railings shall be replaced.

2. Coordinate work of this Section with related trades. Particular attention is required for items to be embedded in concrete work. Provide all punching and drillings indicated or required for attachment of other work to that of this Section.

3. Compliance with Safety Requirements: Dimensions required for the fabrication and installation of handrails, ladders, grating, plate, pipe hangers and etc. which are not shown on the Drawings, shall conform to the requirements of the Division of Occupational Health and Safety.

D. Protection

1. Provide protection and repair of adjacent surfaces and areas which may become damaged as a result of work of this Section. Protect work performed hereunder until completion and final acceptance of project by the Owner. Repair or replace all damaged or defective work to original specified condition, at no additional cost to the Owner.

E. Painting

1. Apply all products in strict conformance with manufacturer’s printed instructions.

2. Provide one or more shop coats of paint on all ferrous metals, except cast-iron, ductile iron, stainless steel and galvanized metals. Before priming, thoroughly clean surfaces. Allow shop coats to dry before materials are loaded for delivery to the job site. After erection, paint all areas where the shop coats have been rubbed off or omitted.

   a. See Section 09 90 00 - Painting of these specifications for surface preparation, prime coatings, finish painting and coatings.

3. Isolate aluminum members from contact with dissimilar metals, concrete and masonry to provide protection from electrolytic deterioration. Use non-absorptive
tape or gaskets, heavy brush coat of approved zinc chromate primer made with a synthetic resin vehicle; or apply a heavy coat of approved alkali-resistant bituminous paint.

END OF SECTION
SECTION 05 52 00

HANDRAILING & LADDERS

PART 1 GENERAL

1.1 WORK INCLUDED

A. The work of this section consists of furnishing and installing all materials and equipment and providing all labor necessary to complete the work shown on the drawings and/or listed below and all other work and miscellaneous items not specifically mentioned but reasonably inferred for a complete installation, including all accessories and appurtenances required for a completed system.

1.2 RELATED WORK

A. Section 05 05 20 – Bolts, Washers, Anchors, and Eyebolts
B. Section 09 90 00- Painting and Coating

1.3 SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

PART 2 PRODUCTS

2.1 HANDRAILING

A. Railings shall conform to current local, state and Cal/OSHA standards and requirements. Railings shall be constructed of aluminum steel and installed as indicated in the Plans.

B. All welding of aluminum shall be done in accordance with the recommendations of the American Welding Society. Welds shall be free of porosity, cracks, holes and flux. All fasteners used shall be stainless steel.

C. Aluminum railings shall be fabricated from 1 ½ inch Schedule 40 pipe, or shall be prefabricated aluminum railings by Enerco “Alumarail”, Universal “Uni-Rail” or equal. Railings shall be provided with mill finish, clear anodic finish AA-MIOC20A41. All fabricated railings shall be provided with the manufacturer’s standard clear anodic A41 finish.

2.2 LADDERS

A. Ladders, safety cages, and rest platforms shall be provided where indicated on the drawings. For ladders made of fiberglass, see fiberglass fabrication section. When required, ladders shall be designed by the ladder supplier. The design shall comply with the latest issue of OSHA/ANSI A14.3 and the applicable building code.
standards for ladders. Ladders and safety cages shall be fabricated with general configurations as indicated on the drawings. All necessary brackets, bolts, and anchors shall be provided. Ladder brackets shall be of the same materials as the ladder. Bracket connection bolts shall be galvanized steel for steel ladders and stainless steel for aluminum, stainless steel, or fiberglass ladders. Bracket anchors to concrete and masonry shall be stainless steel and as indicated on the drawings.

2.3 STAIRS

A. Stairs shall be fabricated to the dimensions, arrangements, sizes, and members indicated on the drawings. For stairs made of fiberglass, see fiberglass fabrication section. Stairs shall be true to line and slope, accurately mitered and joined, and securely and rigidly supported.

2.4 STAIR DESIGN

A. When required, stairs shall be designed by the stair supplier. The design shall comply with all applicable provisions of the local building code, ANSI A117.1, and OSHA as applicable. The design shall be sealed by an engineer registered in the state of the project. Calculations shall be submitted for review when required.

B. The completed fabrications shall support a uniform live load of 100 lbs per square foot and a concentrated load of 300 lbs applied at the center of the span. Individual treads and platforms shall be designed to support a uniform live load of 100 lbs per square foot or a 300 lb concentrated live load applied on an area of 4 square inches. Vertical deflections under full live load shall be limited to span/240. Stairs and landings shall be braced or otherwise designed to avoid noticeable side sway.

C. The stair design and details shall be coordinated with the hand railing and guard railing supplied. Stair members shall be adequate to accept loads from the rail posts based upon the following minimum railing design criteria.

1. 200 lbs applied at any point and in any direction on the top of each rail post.
2. 50 lbs per lineal foot applied in any direction on the handrail.
3. 50 lbs per lineal foot applied horizontally at the required guardrail height simultaneously with 100 plf applied vertically downward at the top of the guardrail.

D. Connections to the supporting structure shall be adequate to transfer all loadings with a factor of safety of at least three times service load. The number and type of connections shall comply, at a minimum, with the design drawings. All necessary brackets, bolts, and anchors shall be provided.
2.5 **PAN TYPE STAIRS**

A. Risers and subtreads shall be fabricated from 12 USS gage steel and subplatforms from 10 USS gage steel. Fill depth shall be 2 inches for treads and 3 inches for platforms, or as otherwise required. Each riser shall have a formed sanitary cove, located so that the toe of the cove will be at the surface of the concrete fill or applied finish, and an integral non-slip nosing.

2.6 **GRATING STAIRS**

A. Risers shall be fabricated from grating material in accordance with the specification for grating and trench covers.

2.7 **CHECKERED PLATE STAIRS**

A. Risers and subtreads shall be fabricated from checkered plate as indicated on the details on the drawings.

2.8 **NOSINGS**

A. All stair treads shall have non-skid nosings, either fabricated integrally with the tread or attached with stainless steel bolts and self-locking nuts.

2.9 **SHOP COATING**

A. All structural and miscellaneous metal items shall be shop coated as specified herein. The requirements for field painting are covered in the protective coatings, Section 09 90 00 – Painting.

B. Surfaces shall be dry and of proper temperature when coated, and shall be free of grease, oil, dirt, dust, grit, rust, loose mill scale, weld flux, slag, weld spatter, and other objectionable substances. Articles to be galvanized shall be pickled before galvanizing. All other ferrous metal surfaces shall be cleaned by high-speed power wire brushing or by blasting to the extent recommended by the paint manufacturer. Welds shall be scraped, chipped, and brushed to remove all weld spatter.

C. Sharp projections of cut or sheared edges of ferrous metals which will be submerged in operation, except for items specified to be hot-dip galvanized, shall be ground to a radius as needed to ensure satisfactory paint adherence.

D. All galvanizing shall be done by the hot-dip process after fabrication. An approved zinc-rich paint shall be used to touch up minor coating damage. Materials with significant coating damage shall be regalvanized or replaced.

E. Where galvanized bolts are indicated on the drawings or specified, the use of zinc-plated bolts will not be acceptable.
2.10 PRIME PAINTED STEEL

A. Unless otherwise specified or indicated on the drawings, all ungalvanized structural and miscellaneous steel shall be given a universal prime coat in the shop after fabrication. Red oxide primer may be substituted for the specified universal primer only if specifically permitted in the data sheet. Special primers may be required for certain steel materials as indicated on the drawings. Steel surfaces shall be prime-coated as soon as practicable after cleaning. Steel shall not be moved or handled until the shop coat is dry and hard.

B. The dry film thickness of the shop coating shall be at least 2 mils for universal primer or red oxide primer and at least 5 mils for epoxy enamel. The dry film thickness of special primers shall be as recommended by the manufacturer.

2.11 ALUMINUM

A. All surfaces of aluminum which will be in contact with concrete, mortar, or dissimilar metals shall be given a coat of epoxy enamel.

2.12 STAINLESS STEEL

A. Unless otherwise specified or permitted, all items fabricated from stainless steel shall be thoroughly cleaned and degreased after fabrication. Pickling or a light blast cleaning shall produce a modest etch and remove all embedded iron and heat tint. Surfaces shall be subjected to a 24 hour water test or a ferroxyl test to detect the presence of residual embedded iron and shall be retreated as needed to remove all traces of iron contamination. Surfaces shall be adequately protected during shipping and handling to prevent contact with iron or steel objects or surfaces.

B. Painting of zinc coated steel or bronze surfaces will not be required.

2.13 FINISH PAINTED STEEL

A. Steel materials specifically indicated on the drawings shall be finished painted after priming prior to delivery to the job site. Color shall be selected by Engineer.

PART 3 EXECUTION

3.1 GENERAL

A. Materials shall be erected and installed in conformity with dimensions, and arrangements specified or indicated on the drawings.

B. All members and parts, as erected, shall be free of winds, warps, local deformations, and unauthorized bends.

C. Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as indicated on the drawings.
D. Light drifting will be permitted to draw parts together, but drifting to match unfair holes will not be permitted. Any enlargement of holes necessary to make connections in the field shall be done only with the approval of Engineer by reaming with twist drills. Enlarging holes by burning will not be permitted.

E. All materials shall be erected in compliance with OSHA 29 CFR, Part 1926, Subpart R, and in compliance with all other applicable OSHA and local safety regulations.

3.2 INSPECTION AND TESTING

A. When the quality control section indicates that special inspections are required, such inspections shall be performed for field fabrication and erection of structural and miscellaneous metals, and for all structural steel field connections. The erector shall provide access as needed to facilitate all inspections and shall provide timely notification during erection when inspection milestones are approaching.

3.3 STRUCTURAL AND MISCELLANEOUS STEEL

A. Except as otherwise specified or indicated on the drawings, all work shall conform to the applicable provisions of the AISC "Manual of Steel Construction - Allowable Stress Design", Parts 1, 2, 3, and 4, the AISC "Specification for Structural Steel Buildings", and the Structural Welding Code of the American Welding Society.

B. Unless otherwise noted, connections shall conform to the details indicated on the design drawings and the fabrication and erection drawings prepared by the steel and metal suppliers. Field welded connections shall not be substituted for field bolted connections indicated on the drawings.

C. Field bolted connections shall conform with the provisions for unfinished and high strength bolted connections. Unless specifically required otherwise, all bearing and slip critical connections shall be fully pre-tensioned.

D. Field welding shall conform with the welding provisions specified. All field welding shall be performed by welders qualified in accordance with American Welding Society for steel welding and American Society for Mechanical Engineers Section IX for stainless steel welding. Welding procedure specifications and qualification records and welder qualification records shall be submitted as needed. All welds shall be visually inspected in accordance with AWS procedures. Additional inspection and testing shall be performed as indicated on the drawings.

3.4 STRUCTURAL AND MISCELLANEOUS ALUMINUM

A. Unless otherwise noted, all work shall conform to applicable provisions of the Aluminum Association "Standard for Aluminum Structures".

B. Unless otherwise noted, connections shall conform to the details indicated on the design drawings and the fabrication and erection drawings prepared by the
aluminum suppliers. Field welded connections shall not be substituted for bolted connections without prior approval of ENGINEER.

C. Field welding of aluminum shall conform with the welding provisions specified. All field welding shall be performed by welders qualified in accordance with the American Welding Society. Welding procedure specifications and qualification records and welder qualification records shall be submitted as needed.

D. Field bolted connections of aluminum shall conform with the specified. Unless otherwise required, all bolted connections shall be fully pre-tensioned.

3.5 CHECKERED FLOOR PLATES

A. Checkered floor plates shall be secured to supporting structure or grating as indicated on the drawings. Plates shall lie flat with no warping or curling. Plate edges shall be neat and parallel. Connection devices shall not protrude above the plate surface.

3.6 LADDERS

A. Ladders and cages shall be installed as indicated on the drawings. Firm, secure anchorage shall be provided to the supporting structure.

3.7 STAIRS

A. Stairs shall be true to line and slope, shall be rigidly supported, and shall be braced and tightened to prevent movement. All treads shall be level and in perfect alignment and spacing. Handrails shall be in alignment and rigidly connected.

B. After installation, stairs shall be rigid and shall not sway noticeably or deflect under foot traffic. If necessary to prevent noticeable movement, additional supports or bracing shall be provided.

3.8 PAINTING

A. After erection, structural and miscellaneous metals shall be cleaned and painted in accordance with the protective coatings, Section 09 90 00 – Painting. Damaged primer and galvanized coatings shall be cleaned and touched up prior to finish painting. If metals are required to be finish painted before erection, damaged areas of coating shall be cleaned, re-primed, and repainted to match the original coating system.

END OF SECTION
SECTION 09 90 00

PAINTING AND COATING

PART 1  GENERAL

1.1  WORK INCLUDED

A. Field painting including surface preparation, surface protection, clean up, and/or other appurtenant work.

B. All labor, materials, tools and equipment, and incidentals necessary and required for their completion.

C. All pipe, fittings, equipment, and structures are to be field coated except for those specific exceptions contained in this specification or identified on the drawings. The painting schedule included at the end of this specification summarizes the surfaces to be coated, the required surface preparation, and the coating systems to be applied. Coating notes on the drawings are used to show exceptions to the schedules, to extend the limits of coating systems, or to clarify or show details for application of the coating systems.

1.2  RELATED WORK

A. Section 03 30 00 – Cast-in-Place Concrete

1.3  SUBMITTALS

A. Submittals shall be in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures.

1. Product technical data including:

a. Acknowledgement that products submitted meet requirements of standards referenced.

b. Performance criteria as required by the Engineer to determine quality.

c. Manufacturer’s installation instructions and environmental parameters.

d. Material Safety Data Sheets.

e. Color samples.
1.4 AIR QUALITY REGULATORY COMPLIANCE

A. All paint shall conform to the applicable air quality regulations at the point of application. Any paint material which cannot be guaranteed by the manufacturer to comply, whether specified by product designation or not, shall not be used.

B. The volatile organic compound (VOC) of coatings materials limits set forth in Rule 460.1 of the San Joaquin Valley Unified Air Pollution Control District shall apply to this project. The manufacturers’ products listed in paragraphs 09900-3.01 and 3.02 have been selected on the basis of their apparent compliance with Rule 460.1; however, it shall remain the Contractor’s responsibility to ensure that all coatings materials furnished are in compliance with all regulatory agencies.

C. The product listed may meet the VOC requirement in the unthinned (as shipped) condition, but may exceed the VOC requirement if thinned to the manufacturer’s allowable recommendations. In this situation, the product is not to be thinned beyond the limit indicated in Rule 460.1, and if the product cannot be suitably thinned for the intended application method or temperature requirements, it will be necessary to use another manufacturer’s product subject to acceptance by the Engineer.

D. It shall be the responsibility of the Contractor to ensure the compatibility of the field painting products which will be in contact with each other or which will be applied over shop painted or previously painted surfaces. Paint used in successive field coats shall be produced by the same manufacturer. Paint used in the first field coat over shop or field primed surfaces, or previously painted surfaces shall cause no wrinkling, lifting, or other damage to underlying paint.

E. All paint used for intermediate and finish coats shall be guaranteed by the paint manufacturer to be fume-proof. Paint shall be lead-free and mercury-free.

1.5 QUALITY OF WORK

A. All finishes shall be applied by skilled workmen in accordance with the best practices and standards of the painting trade. Brushes, rollers, all equipment, and the techniques used in applying finishes shall be of sufficient quality to assure the specified results. Work not conforming to this Specification shall be corrected by touching up or refinishing as directed by the Engineer.

B. It is the purpose and intent of this Specification to cover the complete paint finishing of all exterior and interior surfaces as scheduled or specified and all surfaces which normally require a paint finish for corrosion resistance, weather protection, finished appearance or utility. Finished surfaces shall be of the type of finish, color sheen film thickness and quality specified.

1.6 DELIVERY AND STORAGE

A. Painting materials shall be delivered to site in manufacturer’s original containers with labels intact and seals unbroken. Painting materials and equipment shall be stored and protected against freezing and mixed in rooms assigned for that
purpose. No chemicals, unauthorized thinners, or other materials, not included in the paint formulation shall be added to the paint for any purpose. All necessary precautions shall be taken to prevent fire. Rags or waste soiled with paint shall be removed from premises at end of each day's work, or shall be stored in covered metal containers.

1.7 EQUIVALENT PRODUCTS

A. Whenever a coating is specified using the name of a proprietary product or the name of a particular manufacturer or vendor, the specified coating shall be understood as establishing the type and quality of coating desired.

B. Other manufacturers’ products will be accepted provided sufficient information is submitted to allow the Engineer to determine that the coatings proposed are equivalent to those named. Proposed coatings shall be submitted for review in accordance with the Section 01 33 00 - Submittals.

C. Requests for review of equivalency will not be accepted from anyone except the Contractor, and such requests will not be considered until after the contract has been awarded.

D. Specific products for various applications shall be as specified in Part 2. In addition to the products named in Part 2, equivalent products of the following manufacturers will also be acceptable:

   Ameron
   Carboline
   Devoe
   PPG (Pittsburgh)
   Sherwin Williams Co.
   Sinclair
   Tnemec
   Valspar

E. Contractor shall provide verification that equivalent products are acceptable for the desired application.

1.8 REFERENCE STANDARDS

A. SSPC – Society of Protective Coatings, Pittsburgh, PA

B. ASTM – American Society For Testing And Materials, West Conshohocken, PA
PART 2 PRODUCTS

2.1 GENERAL

A. All paint shall be the product of a recognized manufacturer exclusively engaged in the manufacture of painting material. All paints for wood and metal surfaces shall be well-ground and shall not skin, liver, curdle, or body excessively in the containers.

B. The paint shall not show laps or unevenness of color or texture. When applied to vertical surfaces, it shall not sag.

C. All exposed surfaces, including sides and edges, shall be painted. Hangers, brackets, fastenings and other miscellaneous items shall be painted with the same system as the adjacent material. Paint systems shall be in addition to shop primers.

D. Paint shall be stored inside and shall be protected against freezing. No adulterant, unauthorized thinner, or other material not included in the paint formation shall be added to the paint for any purpose.

E. Paint used in successive field coats shall be produced by the same manufacturer. Paint used in the first field coat over shop painted or previously painted surfaces shall cause no wrinkling, lifting, or other damage to underlying paint. Any paint system shall be the product of a single manufacturer.

F. All paint used for intermediate and finish coats shall be guaranteed by the paint manufacturer to be lead-free, mercury-free, and fumeproof. Where paint materials are referenced to Federal or military specifications, the reference shall define general type and quality required but is not intended to limit acceptable materials to an exact formulation.

G. For each paint, the Contractor shall follow the paint manufacturer's specific application instructions. Upon the Engineer's request, the Contractor shall furnish the following application instructions.

1. Surface preparation recommendations.
2. Type of primer to be used.
3. Maximum dry and wet mil thickness per coat.
4. Minimum and maximum curing times between coats.
5. Thinner to be used with each paint.
6. Ventilation requirements.
7. Atmospheric conditions during which the paint shall not be applied.
8. Allowable methods of application.
9. Maximum allowable moisture content and minimum age of plaster, concrete and wood surfaces at time of paint application.

10. Curing time before submergence in water.

H. The minimum number of coats and minimum total dry mil thickness of the system for each surface shall be as specified in the paint schedule.

2.2 PAINTING SCHEDULE

A. A schedule is appended to this section listing the surface preparation, primer, finish and dry mil thickness to be used on each surface to be coated.

2.3 PRIMERS AND PRETREATMENT


F. P-6 High Build Acrylic – Maximum of 100 sq. ft/gal., Tnemec 180 WB Tneme-Crete, Sherwin Williams “Heavy Duty Block Filler B42W46”.

2.4 INTERMEDIATE AND FINISH PAINTS


Painting and Coating 09 90 00–5
D. F-4 High Build Epoxy (Substitute for Coal Tar) - Minimum dry thickness 6 mils. Devoe “Devtar 5A HS”, Sherwin Williams “Targuard Coal Tar Epoxy B69B60”, or Tnemec “V69F Black”


F. F-6 Acrylic Epoxy – Minimum dry film thickness 4 mils. Tnemec 113 Tnemec-Tufcoat, Sherwin Williams “Waterbased Tile Clad Epoxy B73-100”.

G. F-7 High Build Acrylic – Maximum of 100 sq. ft./gal. Tnemec 180 WB Tnemec-crete, Sherwin Williams “Heavy Duty Block Filler B42W46”.

2.5 FUSION BONDED EPOXY LINING AND COATING

A. Lining and coating shall be a 100% solids, thermosetting, fusion-bonded, dry powder epoxy resin. Provide Scotchkote 134 or 206N, Lilly Powder Coatings "Pipeclad 1500 Red", or equal. Epoxy lining and coating shall meet or exceed the following requirements:

- Hardness (Minimum): Barcol 17 (ASTM D 2583) Rockwell 50 (“M” Scale)
- Abrasion Resistance (Minimum): 1,000 cycles: 0.05 gram removed 5,000 cycles: 0.115 gram removed ASTM D 1044, Tabor CS 17 wheel 1,000 gram weight
- Adhesion (Minimum): 3,000 psi (Elcometer)
- Tensile Strength: 7,300 psi (ASTM D 2370)

2.6 ALUMINUM SURFACES

A. All aluminum in contact with steel or concrete: Sherwin Williams “Macropoxy 646 FC Epoxy B58-600 series or approved equivalent.

2.7 SHOP COATINGS

A. Shop coatings shall be applied as indicated in the individual equipment and component specifications.

B. Electric motors, speed reducers, starters, and other self contained or enclosed components shall be shop primed or finished with a high grade, oil resistant enamel suitable for top coating in the field with an alkyd enamel.

C. All shop coatings shall be compatible with the paint system specified in the Painting Schedule contained at the end of this specification.
2.8 SURFACES NOT TO BE PAINTED

A. Except as otherwise required or directed, the following surfaces are to be left unpainted:

1. Exposed surfaces of aluminum (aluminum in contact with concrete is to be coated).

2. Polished or finished stainless steel. Unfinished stainless steel shall be painted.

3. Nickel or chromium.

4. Galvanized surfaces, except piping, conduit, electrical conduit, pipe supports, fasteners, hangers, bracing, brackets, and accessories.

5. Rubber and plastics, including fiberglass reinforced plastics.


2.9 SYSTEM IDENTIFICATION

A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, either by preprinted marker or stenciled marking, and include arrows to show the direction of flow. Comply with ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and other interruptions including equipment in the line, where lines pass through floor, walls or ceilings or otherwise pass into inaccessible spaces, and at 50’ maximum intervals along exposed portion of lines. Marking of short branches and repetitive branches for equipment connections is not required.

B. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. AC-4). Provide 1/2" high lettering, white on black background. Nameplates shall be permanently secured to the unit.

C. Valves: Provide valve tags on all valves of each piping system, excluding check valves, valves within equipment, faucets, stops and shut-off valves at fixtures and other repetitive terminal units. Provide brass tags or plastic laminate tags. Prepare and submit a tagged valve schedule, listing each valve by tag number, location and piping service. Mount in glazed frame where directed.

2.10 COLORS

A. All colors and shades of colors shall be as specifically indicated in the specifications or plans, or, where not specifically indicated, selected from the manufacturer’s standard color samples by the Owner.
B. Electrical conduit shall be painted to match adjacent ceiling or wall surfaces as directed by the Engineer.

PART 3 EXECUTION

3.1 PRELIMINARY EXAMINATION

A. Notify the Engineer in writing of any uncorrected defects in surfaces to be painted. Do not proceed with the finishing of surfaces in question until any discrepancies are corrected. No work on any surface shall be started, unless the surface has been inspected and approved for painting by the Engineer.

3.2 SURFACE PREPARATION

A. The Contractor shall prepare the surfaces to be coated as specified under the paint schedule. Any surfaces to be coated which are not listed under the paint schedule shall be prepared in accordance with the manufacturer's instructions for the material to be applied.

B. All grease, oil, dirt, and other contaminants which may affect the bond between the coating and the surface shall be removed by a cleaning agent which will leave the surface clean and dry.

C. Cleaning and painting operations shall be performed in a manner which will prevent dust or other contaminants from getting on freshly painted surfaces.

D. Surfaces shall be free of cracks, pits, projections, or other imperfections which would prevent the formation of smooth, unbroken paint film, except for concrete block construction where a rough surface is an inherent characteristic.

E. When applying touch-up paint, or repairing previously painted surfaces, the surfaces to be painted shall be cleaned and sanded or wire brushed in such a manner that the edges of adjacent paint are feathered or otherwise smoothed so that they will not be noticeable when painted. All paint made brittle or otherwise damaged by heat or welding shall be completely removed.

F. Hardware items such as bolts, screws, washers, springs, and grease fittings need not be cleaned prior to painting if there is no evidence of dirt, corrosion, or foreign material.

G. All galvanized surfaces shall have a metal conditioner applied prior to the first prime coat.

H. All surfaces to be finished shall be clean and dry before any materials are applied. Use a moisture meter to determine moisture content as follows. The moisture content shall be less than 18% for wood; 8% for concrete or plaster.

1. Metal Surfaces - Where noted, the surface preparation for steel and other metals refer to the specifications for surface preparation by the latest revision of the Steel Structures Painting Council. All metal work shall be
cleaned of grease, oil and dirt by solvent cleaning (SSPC-SP1). Do not use hydrocarbon based solvents for cleaning prior to use of acrylic materials.

a. Method SP-2: Surface shall be wire brushed where required to remove loose rust and dirt, etc. (SSPC-SP2)

b. Method SP-3: Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by power wire brushing, power impact tools or power sanders. (SSPC-SP3)

c. Method SP-6: Blast cleaning until at least two-thirds of each element of surface area is free of all visible residues. (SSPC-SP6)

d. Method SP-10: Sandblast to near white condition. This method shall remove all rust and scale, but streaks and shadows in the metal will be acceptable. (SSPC-SP10)

2. Wood Surfaces

a. Method W-1: All unprimed millwork delivered to the jobsite shall be given the specified first coat on all surfaces immediately upon arrival. Give all unprimed woodwork the specified first coat as soon as possible following installation. Prime any wood surface that is to be in contact with concrete, or a caulking material, with the specified first coat material before installation. Unless specified otherwise, all casings and trim, and all woodwork shall be free of oil, dirt, loose fibers, etc., sealed with a sanding sealer recommended by the coating manufacturer, and sanded smooth and dusted thoroughly before application of the priming coat. Give all knots, pitch pockets and sappy areas a preliminary coat of Dutch Boy Knot Sealer, or approved equivalent, prior to application of the prime coat.

3. Galvanized Surfaces

a. Method G-1: All galvanized surfaces shall be prepared for painting in strict conformity with the instructions of the manufacturer. All galvanized shall be cleaned per SSPC-SP7.

4. PVC Pipe

a. Method V-1: All wax and oil shall be removed from PVC plastic surfaces by wiping with a solvent of the type used for the specified primer.

3.3 PAINT APPLICATION

A. Apply all finishes evenly, free from sags, runs, crawls, brush marks, skips or other defects. Apply products at the proper consistency and do not thin or otherwise alter them except in accordance with the manufacturer’s printed directions. All coats shall be applied in such manner as to produce an even film of uniform
thickness completely coating all corners and crevices. All painting shall be done by thoroughly experienced workmen.

B. Care shall be exercised during spraying to hold the nozzle sufficiently close to the surfaces being painted to avoid excessive evaporation of the volatile constituents and loss of material into the air, or the bridging over of crevices and corners. Spray equipment shall be equipped with mechanical agitators, pressure gauges, and pressure regulators. Nozzles shall be of proper size. Floors, roofs, and other adjacent areas and installations shall be satisfactorily protected by drop cloths or other precautionary measures. All over-spray shall be removed by approved methods or the affected surface repainted. Care shall be exercised to avoid lapping of paint on hardware or other unscheduled surfaces.

C. Each coat of material shall be thoroughly dry before the application of a succeeding coat. In no case shall paint be applied at a rate of coverage per gallon which is greater than the maximum rate recommended by the manufacturer. Paint films showing sags, checks, blisters, teardrops, or fat edges will not be accepted. Paint containing any of these defects shall be entirely removed and the surface repainted.

D. Sandpaper enamels and varnishes lightly between coats and dust thoroughly before the application of a succeeding coat.

E. If the finish coat is to be colored, the prime coat and the intermediate coat shall be tinted to have a slight variation in color from each other and from the finish coat.

3.4 PRIMING

A. Edges, corners, crevices, welds, and bolts shall be given a brush coat of primer before the specified spot or touch-up painting of metal surfaces. Special attention shall be given to filling all crevices with paint.

B. Abraded and otherwise damaged portions of shop applied paint shall be repainted. Welded seams and other uncoated surfaces, heads and nuts of field installed bolts, and surfaces where paint has been damaged by heat, shall be given a coat of the specified primer. This patch, spot, or touch-up painting shall be completed, and shall be dry and hard, before additional paint is applied.

3.5 LATEX PAINT

A. Latex paint shall be applied by brushing or rolling; spraying is not permitted. Latex paint shall not be thinned excessively.

3.6 MIXING AND THINNING

A. Paint shall be thoroughly mixed each time any is withdrawn from the container. Paint containers shall be kept tightly closed except while paint is being withdrawn.

B. Unless otherwise authorized, all paint shall be factory mixed to proper consistency and viscosity for hot weather application without thinning. Thinning will be
permitted only as necessary to obtain recommended coverage at lower application temperatures. In no case shall the wet film thickness of applied paint be reduced, by addition of paint thinner or otherwise, below that represented by the recommended coverage rate.

### 3.7 FILM THICKNESS FOR FERROUS METALS

A. It is intended that the dry film thickness and the continuity of painted ferrous metal surfaces be subject to continual field check by the Engineer. Dry film thickness shall be measured by the Contractor, using an approved Thickness Gauge, at locations selected by Engineer. Testing equipment provided shall be provided by Contractor and kept on site.

B. Measurement of Dry Coating Thickness shall conform with paint application Standard SSPC-PA2

C. Thickness and Holiday Checking - Thickness of coatings and paint shall be checked with a non-destructive, magnetic type thickness gauge.

D. Holiday Checking of all interior coated surfaces shall be tested with an approved holiday detection device. Non-destructive holiday detectors shall not exceed 100 volts nor shall destructive holiday detectors exceed the voltage recommended by the manufacturer of the coating system. For thicknesses between 10 and 20 mils (0.25mm and 0.50mm) a non-sudsing type wetting agent such as Kodak Photo-Flo, shall be added to the water prior to wetting the detector sponge. All pinholes shall be marked, repaired in accordance with the manufacturer’s printed recommendations and re-tested. No pinholes or other irregularities will be permitted in the final coating. Holiday detection devices shall be operated in the presence of the Engineer.

E. Continuity shall be tested by a low voltage-wet sponge per RPO 188. Contractor shall perform continuity tests as required by the Engineer on surfaces that will be submerged.

### 3.8 ATMOSPHERIC CONDITIONS

A. Apply all material to dry and properly prepared surfaces when weather conditions are favorable for painting. No materials shall be applied when the temperature of the materials is below 50 degrees F, or when the temperature of the air, surface to be painted or substrate, is below (or likely to fall below) 50 degrees F. Final ruling on the favorability of weather conditions shall be in accordance with the recommendations of the manufacturer and/or the Engineer.

B. No coating or paint shall be applied to wet or damp surfaces, in rain, snow, fog, or mist, when the steel temperature or surrounding air temperature is less than 5 degrees above the dew point, nor in conditions not recommended by the manufacturer.
3.9 REPAIRING DAMAGED PAINT ON EQUIPMENT

A. Painted surfaces on equipment, which have become damaged prior to acceptance by the Owner, shall be repainted with the same or equivalent paint used in the original application.

3.10 PROTECTION OF SURFACES

A. Throughout the work the Contractor shall use drop cloths, masking tapes, and other suitable measures to protect all surfaces from accidental spraying, splattering, or spilling of paint. Contractor shall be liable for and shall correct and repair any damaged condition resulting from its operations or from the operations of all those who are responsible to the Contractor during the time its work is in progress and until the work is accepted. In case bituminous paints are spilled or dropped on any material except metals, the spots shall, after surface cleaning, be spot painted with aluminum paint prior to applying the specified paint. Any exposed concrete or masonry not specified to be painted which is damaged by paint shall be either removed and rebuilt or, where so authorized by the Owner, painted with two coats of masonry paint.

3.11 CLEANUP

A. All cloths and cotton waste which might constitute a fire hazard shall be placed in metal containers or destroyed at the end of each work day. Upon completion of the work all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by the Engineer.
3.12 **PAINTING SCHEDULE**

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>SURFACE</th>
<th>FINISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>New ferrous metal in submerged or damp environment including all submerged mechanical components.</td>
<td><strong>SURF.</strong> SP-10  <strong>PRIME</strong> P-1  <strong>2ND</strong> F-1  <strong>3RD</strong> F-1</td>
</tr>
<tr>
<td>2.</td>
<td>All exterior exposed new structural and miscellaneous steel. All exterior exposed surfaces of new piping, pumps, motors, electrical equipment and other unsubmerged mechanical and structural items.</td>
<td><strong>SURF.</strong> SP-2 or 3  <strong>PRIME</strong> P-2  <strong>2ND</strong> F-2  <strong>3RD</strong> F-2</td>
</tr>
<tr>
<td>3.</td>
<td>All surfaces of new structural and miscellaneous steel pipe, pumps, motors and electrical equipment panels exposed inside building.</td>
<td><strong>SURF.</strong> SP-6  <strong>PRIME</strong> P-2  <strong>2ND</strong> F-3  <strong>3RD</strong> F-3</td>
</tr>
<tr>
<td>4.</td>
<td>All interior exposed new galvanized metalwork including electrical conduit inside buildings, including fittings, boxes, supports and accessories.</td>
<td><strong>SURF.</strong> G-1  <strong>PRIME</strong> P-3  <strong>2ND</strong> F-3  <strong>3RD</strong> F-3</td>
</tr>
<tr>
<td>5.</td>
<td>All exterior exposed new galvanized metalwork including roof flashings ad other architectural items.</td>
<td><strong>SURF.</strong> G-1  <strong>PRIME</strong> P-3  <strong>2ND</strong> F-2  <strong>3RD</strong> F-2</td>
</tr>
<tr>
<td>6.</td>
<td>Exposed new PVC piping</td>
<td><strong>SURF.</strong> V-1  <strong>PRIME</strong> F-5  <strong>2ND</strong> F-5</td>
</tr>
</tbody>
</table>

Painting and Coating
09 90 00–13
7. All new buried valves and flanged joints and other buried miscellaneous ferrous piping and metal surfaces (excluding cast iron pipe). All exterior surfaces of new cast iron and steel piping exposed in manholes, wet wells and similar locations, including valves, fittings, flanges, bolts, supports, and accessories. Miscellaneous new castings, including manhole rings and covers and manhole steps. (One coat, if not foundry dipped.)

8. Interior wood

9. Exterior wood

10. Interior dry wall

11. Exterior concrete block

12. Concrete

3.13 When conflicting painting specifications or requirements are encountered in the contract documents, the more restrictive specifications or requirements shall be required.

END OF SECTION
SECTION 26 05 00

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under Division 26.

B. Related work under this section

1. Labor and materials required to furnish and install the electrical systems in a complete and operational fashion.
2. Carpentry, masonry, steel and concrete materials and labor required for construction of proper stands, bases and supports for electrical materials and equipment.
3. Cutting and patching of holes required by installation including flashing and counter-flashing of roof and exterior wall penetrations.
4. Excavating, pumping and backfilling required for installation.
5. Repair of damage to the premises resulting from construction activities under this Section to Owner’s satisfaction.
6. Removal of work debris from construction activities to Owner’s satisfaction.
7. Testing and cleaning of equipment installed.

C. Work not under this section

1. Furnishing of motors, pumps, fans, compressors, water heaters, thermostats and motor starters included under Divisions 23 and 40, or as noted otherwise.
2. Finish painting of exposed metal surfaces included under Division 09, or as otherwise noted.
3. Electrical Contractor shall provide connections to mechanical equipment where voltage exceeds 50 V and all necessary raceways for low voltage controls.

D. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
2. The requirements of this Section apply to all Division 26 work, as applicable.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations
   a. Title 8 –Industrial Relations; Section 1 –Department of Industrial Relations
1) Chapter 3.2 -California Occupational Safety and Health Regulations (CAL/OSHA)

2) Chapter 4 –Section of Industrial Safety
   a) Subchapter 4 -Construction Safety Orders (CSO)
   b) Subchapter 5 -Electrical Safety Orders (ESO)

b. Title 24 –California Building Standards
   1) Part 1 -Building Standards Administrative Code
   2) Part 2 -California Building Code (CBC); International Building Code (IBC) with California amendments
   3) Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   4) Part 4 -California Mechanical Code (MEC); IAPMO Uniform Mechanical Code (UMC) with California amendments
   5) Part 5 -California Plumbing Code; IAPMO Uniform Plumbing Code (UPC) with California amendments
   6) Part 6 -California Energy Code
   7) Part 7 -California Elevator Safety Construction Code
   8) Part 9 -California Fire Code; International Fire Code (IFC) with California amendments
   9) Part 12 -California Reference Standards Code

2. CPUC –California Public Utilities Commission
   a. GO-95; Rules for Overhead Electric Line Construction
   b. GO-128; Rules for Construction of Underground Electric Supply and Communication Systems

3. IEEE –Institute of Electrical and Electronic Engineers
   a. C2; National Electrical Safety Code (NESC)

4. NECA –National Electrical Contractors Association
   a. 1; Standard Practices for Good Workmanship in Electrical Contracting
   b. 4090; Manual of Labor Units

5. All applicable local municipal codes and ordinances.

6. Applicable rules and regulations of local utility companies.

1.03 SUBMITTALS

A. Product Data
   1. Refer to Section 01 33 00 “Submittals.”

B. Closeout Submittal
   1. Furnish three complete sets of maintenance and operating instructions bound in a binder and indexed to Owner. Start compiling data upon approval of materials
and equipment. Final inspection will not be made until Engineer approves binders. Refer also to Division 1 for additional requirements.

2. Provide one of each manufacturer proprietary tool required for proper equipment operation and maintenance provided under this Division. All tools shall be delivered to the Owner at project completion.

3. Provide two keys to Owner for each lock furnished under Division 26.

4. As-Built Drawings
   a. Refer to Section 01 70 00 “Contract Closeout.”

1.04 SUBSTITUTIONS

A. Refer to Division 00.

1.05 CHANGE ORDER PROPOSALS

A. Refer to Division 00.

B. All change order proposals and requests, both additive and deductive, shall be accompanied by a detailed materials and labor breakdown for each specific task and/or item.

1.06 QUALITY ASSURANCE

A. References to codes, standards, specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to bid submittal. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.

B. Work and materials shall be in full accordance with the latest rules and regulations of applicable state of local laws or regulations and standards of following:

1. National Fire Protection Association (NFPA)
2. California Electrical Code (CEC)
3. California Occupational Safety Health Act (Cal-OSHA)
4. California State Fire Marshall (CSFM)
5. California Code of Regulations (CCR)
6. Electrical Safety Orders, CAC Title 8 (ESO)
7. California Public Utilities Commissions, General Order 95 (GO-95)
8. Applicable rules and regulations of local utility companies.

C. All electrical equipment and material furnished under Division 16 shall conform to all CEC requirements and bear the Underwriters’ Laboratories (UL) label where applicable.
D. Nothing in the Construction Documents shall be construed to permit work not conforming to these Codes. Whenever the indicated material, workmanship, arrangement or construction is of high quality or capacity than that required by the above rules and regulations, the Construction Documents shall take precedence. Should there be any direct conflict between the rules and regulations and Construction Documents, the rules shall govern.

E. All electrical equipment and material furnished under this Division shall conform to NEMA and ASTM standards, CEC and bear the Underwriters’ Laboratories (UL) label where such label is applicable.

F. All electrical work shall conform to manufacturer’s written instruction, and the NECA Standard Practices for Good Workmanship in Electrical Contracting and all published recommended practices at the time of project. The Contractor shall use the requirements within the Specifications whenever they exceed NECA guidelines.

G. Follow manufacturer’s direction where these direction cover points not included with the Construction Documents.

1.07 DELIVERY, STORAGE AND HANDLING

A. Packing, shipping, handling and unloading
   1. Damage to the equipment delivered to the site or in transit to the job shall be the responsibility of the Electrical Contractor.
   2. Equipment and material delivery of shall be scheduled as required for timely, expeditious progress of work.

B. Storage and protection of job equipment is the responsibility Contractor.

C. Comply with Division 01 requirements with regards to waste management and disposal.

1.08 PROJECT CONDITIONS

A. Discrepancies
   1. In the event of discrepancies with the Contract Documents, Engineer shall be notified with sufficient time as stated within Division 1 to allow the issuing of an addendum prior to the bid opening.
   2. If, in the event that time does not permit notification of clarification of discrepancies prior to the bid opening, the following shall apply:
      a. The drawings govern in matters of quantity and specifications govern in matters of quality.
      b. In the event of conflict within the drawings and specifications involving quantities or quality, the greater quantity or higher quality shall apply. Such discrepancies shall be noted and clarified within the contractor’s bid. No additional allowances will be made because of errors, ambiguities or omissions which reasonably should have been discovered during the bid preparation.
B. Verify all power and communication utilities’ requirements prior to commencement of any utility work. Make proper adjustments to the construction to satisfy the serving utility.

C. Information shown relative to services is based upon available records and data, but shall be regarded as approximate only. Make minor deviations found necessary to conform to actual locations and conditions without extra cost. Verify locations and elevations of utilities prior to commencement of excavation for new underground installation.

D. Exercise extreme care in excavating near existing utilities to avoid any damage thereto; be responsible for any damage caused by such operations. Contact all utility companies to obtain exact locations prior to commencement of construction.

E. The electrical plans indicate the general layout and arrangement; the field conditions shall determine exact locations. Field verify all conditions and modify as required to satisfy design intent. Maintain all required working clearances.

F. Fees, permits and utility services
   1. Obtain and pay for all permits and service charges required for the installation of this work. Arrange for required inspections and secure approvals from authorities having jurisdiction. Arrange for all utility connections and pay charges incurred including excess service charges if any.
   2. Extra charges imposed by the electrical and communication utility companies shall be included in the bid, if available. Unless otherwise stated, these charges will be assumed to include in the bid.

G. Provide and maintain temporary construction power. The General Contractor will pay for electric energy charges. Should the Electrical Contractor be the prime contractor, the Electrical Contractor shall pay for energy charges unless negotiated with Owner.

1.09 SEQUENCING

A. Coordinate work within phasing plans as provided by the Owner.

1.10 WARRANTY

1. Refer to Division 00.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials mentioned herein or on Drawings require that the items be provided and of quality noted or an approved equal. All materials shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of the same brand or manufacturer throughout for each class of material or equipment.
B. Trade names or catalog numbers stated herein indicates grade or quality of material desired. Materials, where applicable, shall be UL labeled and in accordance with NEMA standards.

C. Dimensions, sizes and capacities shown are a minimum. Do not make changes without written permission of Engineer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine Construction Documents and Site; be familiar with types of construction where electrical installation is involved. Note carefully other sections of Specifications with their individual cross-references, standard details, etc.

B. Any electrical work or materials shown either in Construction Documents, but not mentioned herein, or vice versa, shall be executed the same as if mentioned herein, in a workmanlike manner in accordance with all published NECA Standards of Installation.

C. Coordinate work with other crafts to avoid conflicts, and check all outlet locations with drawings and specifications. Make minor adjustments without additional cost to Owner.

D. Engineer will make clarifications and rulings concerning any obvious discrepancies or omissions in work prior and after bidding. Perform all work involved in correcting obvious errors or omissions after award of contract as directed by Engineer at Contractor's expense.

E. Examine site dimensions and locations against Drawings and become informed of all conditions under which work is to be done before submitting proposals. No allowance will be made for extra expense due to error.

F. Layouts of equipment, accessories and wiring systems are diagrammatic (not pictorial), but shall be followed as closely as possible. Construction Documents are for assistance and guidance, and exact locations, distance, levels, etc., will be governed by construction; accept same with this understanding.

G. Horsepower of motors or wattage of equipment indicated in Construction Documents is estimated horsepower or wattage requirement of equipment furnished under other sections of Specifications. Size all feeders (conduit and wiring), motor starters, overload protection and circuit breakers to suit horsepower of motors or wattage of equipment actually furnished under various sections of specifications. However, in no case shall feeders and branch circuits (conduit and wiring) and circuit breakers be of smaller capacities or sizes than those indicated on Drawings or specified, unless approved in writing by Engineer.

3.02 PREPARATION

A. Seal all exterior wall penetrations in an approved watertight manner and to the satisfaction of Engineer and Owner.

B. Channels, joiners, hangers, caps, nuts and bolts and associated parts shall be plated electrolytically with zinc followed immediately thereafter by treating freshly deposited
zinc surfaces with chromic acid to obtain a surface which will not form a white deposit on surface for an average of 120 hours when subjected to a standard salt spray cabinet test, or shall be hot dipped galvanized.

3.03 INSTALLATION

A. Equipment identification

1. Properly identify panelboards, remote control switches, push buttons, terminal boxes, etc. with a descriptive nameplate. Make nameplate with 3/32” laminated plastic with black background and white letters. Machine engraved letters 1/8” high for equipment in device box(es) and 1/4” high for panelboards, terminal cabinets or larger items. Punched strip type nameplates and cardholders in any form are not acceptable. Fasten nameplates with oval head machine screws, tapped into front cover/panel.

B. Working spaces

1. Provide adequate working space around electrical equipment in compliance with Article 4 of Electrical Safety Orders and CEC 110.26. In general provide 78” of headroom and 30” wide minimum clear workspace in front of panelboards and controls. In addition to the above, provide the following minimum working clearances:
   a. 0V – 150V (line-to-ground) provide 36” minimum clear distance.
   b. 151V – 600V (line-to-ground) provide 42” minimum clear distance.

C. Equipment supports

1. Anchor all electrical equipment to structure. Support systems shall be adequate to withstand seismic forces per CBC.

D. Excavating and backfilling

1. Excavate and backfill as required for installation of Work. Restore all surfaces, roadways, walks, curbs, walls existing underground installations, etc., cut by installations to original condition in an acceptable manner. Maintain all warning signs, barricades, flares and lanterns as required by ESO and local ordinances.

2. Dig trenches straight and true to line and grade, with bottom clear of any rock points. Support conduit for entire length on undisturbed original earth. Minimum conduit depth of pipe crown shall be 24” below finished or natural grade, unless otherwise noted.

E. Forming, cutting and patching

1. In new construction, General Contractor shall provide any special forming, recesses, chased, etc., and provide wood blocking, backing and grounds as necessary for the proper installation of electrical work. Be responsible for notifying General Contractor that such provision is necessary; layout work and check to see that it suits his requirements.
   a. Provide metal backing plates, anchor plates and such that are required for anchorage of electrical work under Division 26; securely weld or bolt to metal framing. Wood blocking or backing will not be permitted in combination with metal framing.
2. Be responsible for proper placement of pipe sleeves, hangers, inserts and supports for this Work.

F. Concrete work

1. Provide concrete work related solely to electrical work. Concrete work, including forming and reinforcing steel installed for all electrical work, shall comply with all applicable requirements of Division 03, or in accordance with the State of California Standard Specifications issued by the Department of Transportation (CALTRANS).

3.04 REPAIR/RESTORATION

A. Cutting, patching and repairing of existing construction to permit installation of work under Division 26 is the responsibility of Contractor. Repair or replace all damage to existing work in kind to Owner’s satisfaction.

B. Obtain Engineer’s approval prior to performing any cutting or patching of concrete, masonry, wood or steel structure within building.

3.05 FIELD QUALITY CONTROL

A. Inspection of work

1. Working parts shall be readily accessible for inspection, repair and renewal. The right is reserved to make reasonable changes in equipment location shown on Drawings prior to rough in without additional costs to the Owner.

2. During construction all work will be subject to observation by the Engineer and his representatives. Assist in ascertaining any information that maybe required.

3. Do not allow or cause any work installed hereunder to be covered up or enclosed before it has been inspected and approved. Should any work be enclosed or covered prior to approval, uncover work, and after it has been inspected and approved, restore work of all others to the condition in which it was found at the time of cutting, all without additional costs to Owner.

B. Furnish all testing equipment as maybe required.

C. Test all wiring and connections for continuity and grounds; where such tests indicate faulty insulation or other defects, locate, repair and re-test.

D. Check rotation of all motors and correct if necessary.

3.06 CLEANING

A. Repair or replace all broken, damaged or otherwise defective parts without additional cost to Owner, and leave entire work in a condition satisfactory to Engineer. At completion, carefully clean and adjust all equipment, fixtures and trim installed as part of this work; leave systems and equipment in satisfactory operating condition.

B. Clean out and remove from the site all surplus materials and debris resulting from this work; this includes surplus excavated materials.

3.07 DEMONSTRATION
A. At project completion, Contractor shall allot a period of not less than 8 hours per well site for instruction of operating and maintenance personnel in the use of all systems installed under this Division. This time is in addition to any instruction time stated in the Specifications of other sections for other equipment (i.e., fire alarm, security, intercom, etc.). All personnel shall be instructed at one time, the Contractor shall make all necessary arrangements with manufacturer’s representatives as may be required. Contractor, if any, for the above services shall pay all costs.

3.08 PROTECTION

A. In performance of work, protect work of other trades as well as work under this Division from damage.

B. Protect electrical equipment, stored and installed, from dust, water or other damage.

END OF SECTION
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PART 1 - GENERAL

1.01 SUMMARY

A. Section includes
   1. Provide all labor, materials and equipment necessary for the installation of all conductors and cables under this Section related to lighting, power, mechanical, control and signal systems.

B. Related sections
   1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
   2. The requirements of this Section apply to all Division 26 work, as applicable.
   3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:
   1. ASTM -American Society for Testing and Materials
      a. B3; Standard Specification for Soft or Annealed Copper Wire
      b. B8; Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
      c. B787/B787M; Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation
      d. D1000; Standard Test Method for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
   2. CCR –California Code of Regulations, Title 24
      a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   3. UL -Underwriters Laboratories, Inc.
      a. UL 83; Thermoplastic-Insulated Wire and Cables
      b. UL 486A 486B; Wire Connectors
      c. UL 486C; Splicing Wire Connectors
      d. UL 486D; Standard for Insulated Wire Connector Systems for Underground Use Or In Damp Or Wet Locations
e. UL 486E; Standard for Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
f. UL 493; Thermoplastic-Insulated Underground Feeders and Branch Circuit Cables
g. UL 510; Standard for Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
h. UL 854; Service-Entrance Cables

4. NEMA –National Electrical Manufacturer’s Association
   a. WC 70-1999; Nonshielded Power Cables Rated 2000 Volts or less for the Distribution of Electrical Energy

5. IEEE –Institute of Electrical and Electronic Engineers
   a. 82; Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors

1.03 DELIVERY

A. Wire shall be in original unbroken package. Obtain approval of Inspector or Engineer before installation of wires.

PART 2 - PRODUCTS

2.01 BUILDING WIRE

A. Conductor material
   1. Provide annealed copper for all wire, conductor and cable of not less than 98% conductivity.
   2. Wire #8 AWG and larger shall be stranded.
   3. Wire #10 AWG and smaller may be stranded as long as the device being connected is listed from use with stranded wire. Under no circumstance will crimped terminals be allowed to make the installed Code compliant.

B. Insulation material
   1. All insulated wire, conductor and cable shall be 600 Vac rated.
   2. Feeder and branch circuits larger than #6 AWG shall be type THW, XHHW or THHN/THWN.
   3. Feeder and branch circuits #6 AWG and smaller shall be type TW, THW, XHHW or THHN/THWN.
   4. Control circuits shall be type THW or THHN/THWN.
   5. Wires shall bear the UL label marked with gauge, type and manufacturer’s name on 24” centers.
   6. Insulation color shall match identification stated within these Specifications throughout the entire length. The application of phase taping for conductors will not be permitted.
2.02 FLEXIBLE CORDS AND CABLES

A. Provide flexible cords and cables of size, type and arrangement as indicated on Drawings.
B. Type S flexible cords and cable shall be manufactured in accordance with CEC Article 400 and composed of two or more conductors and a full sized green insulated grounding conductor with an outer rubber or neoprene jacket.
C. Flexible cords and cables shall be fitted with wire mesh strain relief grips either as a integral connector component or an independently supported unit.
D. Suspended flexible cords and cables shall incorporate safety spring(s).

2.03 WIRE CONNECTIONS AND TERMINATIONS

A. Electrical spring wire connectors
   1. Provide multi-part construction incorporating a non-restricted, zinc coated square cross-sectional steel spring enclosed in a steel sheet with an outer jacket of plastic and insulating skirt.
   2. Self-stripping pigtail and tap U-contact connectors are not acceptable.
B. Compression type terminating lugs
   1. Provide tin-plated copper high compression type lugs for installation with hand or hydraulic crimping tools as directed by manufacturer. Notch or single point type crimps are not acceptable.
   2. Two hole, long barrel lugs shall be provided for size #4/O AWG and larger wire where terminated to bus bars. Use minimum of three crimps per lug where possible.
C. Splicing and insulating tape
   1. Provide black, UV resistant, self extinguishing, 7 mil thick vinyl general purpose electrical tape per UL 510 and ASTM D1000. 3M Scotch 33 or equal.
D. Insulating putty
   1. Provide pads or rolls of non-corrosive, self-fusing, 125 mil thick rubber putty with PVC backing sheet per UL 510 and ASTM D1000. 3M Scotchfil or equal.
E. Insulating resin
   1. Provide two-part liquid epoxy resin with resin and catalyst in pre-measured, sealed mixing pouch. 3M Scothcast 4 or equal.
   2. Use resin with thermal and diaelecric properties equal to the cable’s insulating properties.
F. Terminal strips
   1. Provide box type terminal strips in the required quantities plus 25% spare. Install in continuous rows.
   2. Use the box type terminal strips with barrier open backs and with ampere ratings as required.
   3. Identify all terminals strips and circuits.
G. Crimp type connectors
   1. Provide insulated fork or ring crimp terminals with tinned electrolytic copper-brazed barrel with funnel wire entry and insulation support.
   2. Fasten crimp type connectors or terminals using a crimping tool recommended by the manufacturer.
   3. Provide insulated overlap splices with tinned seamless electrolytic copper-brazed barrel with funnel wire entry and insulation support.
   4. Provide insulated butt splices with tinned seamless electrolytic copper-brazed barrel with center stop, funnel wire entry and insulation support.

H. Cable ties
   1. Provide harnessing and point-to-point wire bundling with nylon cable ties. Install using tool supplied by manufacturer as required.

I. Wire lubricating compound
   1. UL listed for the wire insulation and conduit type, and shall not harden or become adhesive.
   2. Shall not be used on wire for isolated type electrical power systems.

J. Bolt termination hardware
   1. Bolts shall be plated, medium carbon steel heat-treated, quenched and tempered equal to ASTM A-325 or SAE Grade 5; or silicon bronze alloy ASTM B-9954 Type B.
   2. Nuts shall be heavy semi-finished hexagon, conforming to ANSI B18.2.2, threads to be unified coarse series (UNC), class 2B steel or silicon bronze alloy.
   3. Flat washers shall be steel or silicon bronze, Type A plain standard wide series, conforming to ANSI B27.2. SAE or narrow series shall be used.
   4. Belleville conical spring washers shall be hardened steel, cadmium plated or silicon bronze.
   5. Each bolt connecting lug(s) to a terminal or bus shall not carry current exceeding the following values:
      a. 1/4” bolt – 125 A
      b. 5/16” bolt – 175 A
      c. 3/8” bolt – 225 A
      d. 1/2” bolt – 300 A
      e. 5/8” bolt – 375 A
      f. 3/4” bolt – 450 A

PART 3 - EXECUTION

3.01 EXAMINATION
A. Thoroughly examine site conditions for acceptance of wire and cable installation to verify conformance with manufacturer and specification tolerances. Do not commence with work until all conditions are made satisfactory.

3.02 INSTALLATION

A. All wire, conductor, and cable with their respective connectors, fittings and supports shall be UL listed for the installed application and ambient conditions.

B. Feeders and branch circuits in wet locations shall be rated 75°C minimum.

C. Feeders and branch circuits in dry locations shall be rated 90°C minimum.

D. Minimum conductor size
   1. #12 AWG copper for all power and lighting branch circuits.
   2. #14 AWG copper for all line voltage signal and control wiring, unless otherwise indicated.

E. Remove and replace conductors under the following conditions at no additional costs to the Owner:
   1. Installed within wrong specified conduit or raceway.
   2. Damaged during installation.
   3. Of insufficient length to facilitate proper splice of conductors

3.03 WIRING METHODS

A. Install wires and cable in accordance with manufacturer’s written instructions, as shown on Drawings and as specified herein.

B. Install all single conductors within raceway system, unless otherwise indicated.

C. Parallel circuit conductors and terminations shall be equal in length and identical in all aspects.

D. Provide adequate length of conductors within electrical enclosures and neatly train to termination points with no excess. Terminate such that there is no bare conductor at the terminal.

E. Splice cables and wires only in junction boxes, outlet boxes, pull boxes, manholes or handholes.

F. Group and bundle with tie wrap each neutral with its associated phase conductors where more than one neutral conductor is present within a conduit.

G. Install cable supports for all vertical feeders in accordance with CEC Article 300. Provide split wedge type fittings, which firmly clamp each individual cable and tighten due to cable weight.

H. Seal cable where exiting a conduit from an exterior underground raceway with a non-hardening compound (i.e., duct seal or equal).

I. Provide UL listed factory fabricated, solder-less metal connectors of size, ampacity rating, material, type and class for applications and for services indicated. Use connectors with temperature ratings equal or greater than the conductor or cable being terminated.
J. Stranded wire shall be terminated using fittings, lugs or devices listed for the application. Under no circumstances shall stranded wire be terminated solely by wrapping it around a screw or bolt.

K. Flexible cords and cables supplied as part of a pre-manufactured assembly shall be installed according to manufacturer's published instructions.

3.04 WIRING INSTALLATION IN RACEWAYS

A. Install wire in raceway after interior of building has been physically protected from weather, and all mechanical work likely to injure conductors has been completed.

B. Pull all conductors into raceway at the same time.

C. Use UL listed, non-petroleum base and insulating type pulling compound as needed.

D. Completely mandrel all underground or concrete encased conduits prior to installation.

E. Completely and thoroughly swab raceway system prior to installation

F. Do not use block and tackle, power driven winch or other mechanical means for pulling conductors smaller than #1 AWG.

G. Wire pulling
   1. Provide installation equipment that will prevent cutting or abrasion of insulation during installation.
   2. Maximum pull tension shall not exceed manufacturer's recommended value during installation for cable being measured with tension dynometer.
   3. Use rope made of non-metallic material for pulling.
   4. Attach pulling lines by means of either woven basket grips or pulling eyes attached directly to the conductors.
   5. Pull multiple conductors simultaneously within same conduit.

3.05 WIRE SPLICES, JOINTS AND TERMINATIONS

A. Join and terminate wire, conductors and cables in accordance with UL 486, CEC and manufacturer’s instructions.

B. Thoroughly clean wires before installing lugs and connectors.

C. Make splices, taps and terminations to carry full conductor ampacity without perceptible temperature rise, and shall be made mechanically and electrically secure.

D. Terminate wires in terminal cabinets using terminal strips, unless otherwise indicated.

E. Insulate spare conductors with electrical tape and leave sufficient length to terminate anywhere within panel or cabinet.

F. Encapsulate splices in wet locations using specified insulating resin kits.

G. Make up all splices and taps in accessible junction or outlet boxes with connectors as specified herein. Pigtails and taps shall be the same color as feed conductor with at least 6 inches of tail, all neatly packed within box.
H. Where conductors are to be connected to metallic surfaces, coated surfaces shall be cleaned to base metal surface before installing connector. Remove lacquer coating of conduits where ground clamps are to be installed.

I. Branch circuits (#10 AWG and smaller) connectors shall comply with 2.03.A and 2.03.B above.

J. Branch circuits (#8 AWG and larger)
1. Join or tap conductors using insulated mechanical compression taps with pre-molded, snap-on insulating boots or specified conformable insulating pad and over-wrapped with two half-lapped layers of vinyl insulating tape starting and ending at the middle of joint.
2. Terminate conductors using mechanical compression lugs in accordance with manufacturer’s recommendation or as specified elsewhere.
3. Field installed compression connectors for 250 MCM and larger shall have not less than two clamping elements or compression indents per wire.
4. Insulate splices and joints with materials approved for the particular use, location, voltage and temperature.

K. Termination hardware assemblies
1. Al/Cu lugs connected to aluminum plated or copper bus shall be secured with steel bolt, flat washer (two per bolt), Belleville washer and nut.
2. Copper lugs connected to copper bus shall be secured using silicon bronze alloy bolt, flat washer (two per bolt), Belleville washer and nut.
3. The crown of Belleville washers shall be under the nut.
4. Bolt assemblies shall be torque to manufacturer’s recommendations. Where manufacturer recommendation is not obtainable, the following shall be used:
   a. 1/4” -20 bolt at 80 inch-pound torque
   b. 5/16” -18 bolt at 180 inch-pound torque
   c. 3/8” -20 bolt at 20 inch-pound torque
   d. 1/2” -20 bolt at 40 inch-pound torque
   e. 5/8” -20 bolt at 55 inch-pound torque
   f. 3/4” -20 bolt at 158 inch-pound torque

3.06 IDENTIFICATION

A. Securely tag all branch circuits. Mark conductors with specified vinyl wrap-around markers. Where more than two conductors run through a single outlet, mark each conductor with the corresponding circuit number.

B. Provide all terminal strips with each individual terminal identified using specified vinyl markers.

C. In manholes, pullboxes and handholes provide tags of embossed brass type with cable type and voltage rating. Attach tags to cable with slip-free plastic cable lacing units.
D. Color coding

1. For 120/208 Volt (or 120/240 Volt), 1 phase, 3 wire systems:
   a. Phase A – Black
   b. Phase B – Red
   c. Neutral – White
   d. Ground – Green

2. For 120/208 Volt, 3 phase, 4 wire systems:
   a. Phase A – Black
   b. Phase B – Red
   c. Phase C – Blue
   d. Neutral – White
   e. Ground – Green

3. For 277/480 Volt, 3 phase, 4 wire systems:
   a. Phase A – Brown
   b. Phase B – Orange
   c. Phase C – Yellow
   d. Neutral – Gray
   e. Ground – Green

4. Switch leg individually installed shall be the same color as the branch circuit to which they originate, unless otherwise indicated.

5. Travelers for 3-way and 4-way switches shall be a distinct color and pulled with the circuit switch leg or neutral.

3.07 FIELD QUALITY CONTROL

A. Supply labor, materials and test equipment required to perform continuity and ground tests.

B. Electrical testing

1. Perform feeder and branch circuit insulation test after installation and prior to connection to device.

2. Tests shall be performed by 600 Vdc megger for a continuous 10 seconds from phase-to-phase and phase-to-ground.

3. Torque test conductor connections and terminations for conformance to Specifications.

4. If any failure is detected, locate failure, determine cause and replace or repair cable to Engineer’s satisfaction at no additional costs.

5. Furnish test results in type written report form for review by Engineer.

END OF SECTION
SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes
   1. Provide all labor, materials and equipment necessary to complete the installation required for the item specified under this Section, including but not limited to power system grounding

B. Related sections
   1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
   2. The requirements of this Section apply to all Division 26 work, as applicable.
   3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:
   1. CCR –California Code of Regulations, Title 24
      a. Part 3 -California Electrical Code (CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   2. IEEE –Institute of Electrical and Electronic Engineers
      a. 142; Recommend Practices for Grounding of Industrial and Commercial Power Systems
   3. NFPA –National Fire Protection Association
      a. 780; Lightning Protection Code
   4. UL –Underwriters Laboratories, Inc.
      a. 467; Grounding and Bonding Equipment

1.03 SYSTEM DESCRIPTION

A. This Section provides for the grounding and bonding of all electrical and communication apparatus, machinery, appliances, components, fittings and accessories where required to provide a permanent, continuous, low impedance, grounded electrical system.

B. Ground the electrical service system neutral at service entrance equipment as shown on the Drawings.
C. Ground each separately derived system, as defined in CEC 250.5 (D) and on the Drawings, unless specifically noted otherwise.

D. Except as otherwise indicated, the complete electrical installation including the neutral conductor, equipment and metallic raceways, boxes and cabinets shall be completely and effectively grounded in accordance with all CEC requirements, whether or not such connections are specifically shown or specified.

1.04 SUBMITTALS

A. Submit manufacturer’s data for equipment and materials specified within this Section in accordance to Section 26 05 00.

1.05 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

PART 2 - PRODUCTS

2.01 CONCRETE ENCASED GROUNDING ELECTRODE (UFER GROUND)

A. #3/O AWG minimum bare stranded copper conductor.

2.02 DRIVEN (GROUND) RODS

A. Copper clad steel, minimum ¾” diameter by 10’-0” length, sectional type with copper alloy couplings and carbon steel driving stud; Weaver, Cadweld or equal.

2.03 INSULATED GROUNDING BUSHINGS

A. Plated malleable iron body with 150°C molded plastic insulated throat and lay-in ground lug; OZ/Gedney BLG, Thomas & Betts #TIGB series or equal.

2.04 CONNECTION TO PIPE

A. Cable to pipe connections; OZ/Gedney G-100B series, Thomas & Betts #290X series or equal.

2.05 CONNECTIONS TO STRUCTURAL STEEL, GROUND RODS OR SPICES

A. Where required by the Drawings, grounding conductors shall be spliced together, connected to ground rods or connected to structural steel using exothermic welds, Cadweld or equal, or high pressure compression type connectors, Cadweld, Thomas & Betts or equal.

2.06 BONDING JUMPERS

A. OZ/Gedney Type BJ, Thomas & Betts #3840 series or equal.

2.07 GROUND CONDUCTOR
A. Ground conductor shall be code size UL labeled, Type THWN insulated copper wire, green in color.

2.08 MAIN BUILDING REFERENCE GROUND BUS (BGB)

A. Provide 1 24”x4”x1/4” TK copper bus bar mounted on wall with insulating stand-offs at +18” AFF. Furnish complete with cast copper alloy body Thomas Betts Series 310 or equal lugs for connecting grounding conductors. Attach lugs to bus with appropriate size bronze bolt, flat washer and Belleville washer. All connections shall be torque, and all holes shall be drilled and tapped for single hole lugs. Provide 4 spare lugs with respective spaces.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Grounding electrodes
   1. Concrete encased grounding electrode (Ufer ground)
      a. Provide a #3/O AWG minimum bare copper conductor encased along the bottom of concrete foundation, footing or trench which is in direct contact with the earth and where there is no impervious waterproofing membrane between the footing and soil. The electrode shall extend through a horizontal length of 30’ minimum and shall be encased in not less than 2" or more than 5" of concrete separating it from surrounding soil. The electrode shall emerge from the concrete slab through a protective non-metallic sleeve and shall be extended to BGB or as shown on Drawings.
   2. Supplementary grounding electrode (ground ring, grid and driven rod)
      a. Provide as shown driven ground rod(s). Interconnect ground rod with structural steel and adjacent rods with code size bare copper conductor. Ground rods shall be space no less than 6'-0” on centers from any other electrode or electrodes of another electrical system.
   3. Separately derived electrical system grounding electrode
      a. Ground each separately derived system per CEC 250-26 or as shown on Drawings, whichever is greater.
   4. Metal underground water pipe
      a. Contractor shall install an accessible grounding electrode conductor from the main incoming cold water line to BGB. The electrode conductor shall be sized per CEC Table 250-94 or as shown on Drawings, whichever is greater.

B. Grounding electrode conductor
   1. Provide grounding electrode conductors per CEC Table 250-94 or as shown on Drawings, whichever is greater.

C. Power system grounding
   1. Connect the following items using code size copper grounding conductors to BGB or as shown on Drawings:
a. Concrete encased electrode (Ufer ground)
b. Ground rod(s)
c. Incoming cold and fire water pipes
d. Gas pipe
e. Structural steel
f. Distribution transformer secondary

D. Equipment Bonding/Grounding
   1. Provide a code sized copper ground conductor, whether indicated or noted on the drawings, in each of the following:
      a. All power distribution conduits and ducts
      b. Distribution feeders
      c. Motor and equipment branch circuits
      d. Device branch circuits
   2. Provide a separate grounding bus at distribution panelboards, loadcenters, switchboards and motor control centers. Connect all metallic enclosed equipment so that with maximum fault current flowing, shall be maintained at not more than 35V above ground.
   3. Metallic conduits terminating in concentric, eccentric or oversized knockouts at panelboards, cabinets, gutters, etc. shall have grounding bushings and bonding jumpers installed interconnecting all such conduits.
   4. Provide bonding jumpers across expansion and deflection coupling in conduit runs, pipe connections to water meters and metallic cold water dielectric couplings.
   5. Provide ground wire in flexible conduit connected at each end via grounding bushing.
   6. Provide bonding jumpers across all cable tray joints.
   7. Bond each end of metallic conduit longer than 36" in length to grounding conductor using a #6 AWG pigtail.

3.02 FIELD QUALITY CONTROL

A. Contractor using test equipment expressly designed for that purpose shall perform all ground resistance tests in conformance with IEEE guidelines. Contractor shall submit typewritten records of measured resistance values to Engineer for review and approval prior to energizing the system.

B. Obtain and record ground resistance measurements both from electrical equipment ground bus to the ground electrode and from the ground electrode to earth. Furnish and install additional bonding and add grounding electrodes as required to comply with the following resistance limits:
   1. Resistance from ground bus to ground electrode and to earth shall not exceed 5 ohms unless otherwise noted.
2. Resistance from the farthest panelboard, loadcenter, switchboard or motor control center ground bus to the ground electrode and to earth shall not exceed 20 ohms maximum.

C. Inspection

1. The Engineer or Inspector prior to encasement, burial or concealment thereto shall review the grounding electrode and connections.

END OF SECTION
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SECTION 26 05 33
RACEWAYS AND BOXES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to electrical conduits; outlet, junction and pull boxes; and related supports.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
   a. 26 05 26 – Grounding and Bonding for Electrical Systems

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ANSI –American National Standards Institute
   a. C33.91; Specification for Rigid PVC Conduit
   b. C80.1; Specification Rigid Steel Conduit, Zinc-Coated
   c. C80.3; Specification for Electrical Metallic Tubing, Zinc-Coated
   d. C80.6; Intermediate Metal Conduit (IMC), Zinc-Coated

2. CCR –California Code of Regulations, Title 24
   a. Part 2 -California Building Code (CBC); International Building Code (IBC) with California amendments
   b. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

3. NECA –National Electrical Contractors Association
   a. 101, Standard for Installing Steel Conduit (Rigid, IMC, EMT)
   b. 111, Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC) (ANSI)

4. NEMA –National Electrical Manufacturer’s Association
a. FB 1; Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
b. FB 2.10; Selection and Installation Guidelines for Fittings for Use with Non-flexible Electrical Metal Conduit or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, and Electrical Metallic Tubing)
c. FB 2.20; Selection and Installation Guidelines For Fittings for Use With Flexible Electrical Conduit and Cable
d. OS 1; Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
e. OS 3; Selection and Installation Guidelines for Electrical Outlet Boxes
f. RN 1; Polyvinyl-Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
g. TC 2; Electrical Plastic Tubing and Conduit
h. TC 3; PVC Fittings for Use with Rigid PVC Conduit and Tubing
i. TC 14; Reinforced Thermosetting Resin Conduit (RTRC) and Fittings

5. OSHPD Anchorage Pre-approvals
   a. OPA-0003; Superstrut Seismic Restraint System
   b. OPA-0114; B-Line Seismic Restraints
   c. OPA-0120; Unistrut Seismic Bracing System
d. OPA-0242; Power-Strut Seismic Bracing System

6. UL –Underwriter’s Laboratories, Inc.
   a. 1; Standard for Flexible Metal Conduit
   b. 6; Rigid Metal Electrical Conduit
c. 360; Standard for Liquid-Tight Flexible Steel Conduit
d. 514A; Metallic Outlet Boxes, Electrical
e. 514B; Fittings for Conduit and Outlet Boxes
   f. 651; Schedule 40 & 80 PVC Conduit
g. 797; Electrical Metallic Tubing
   h. 1242; Intermediate Metal Conduit
   i. 1684; Reinforced Thermosetting Resin Conduit (RTRC) and Fittings

1.03 SYSTEM DESCRIPTION

A. Furnish, assemble, erect, install, connect and test all electrical conduits and related raceway apparatus required and specified to form a complete installation.

1.04 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.
1.05 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. Installation shall conform to the NECA installation guidelines unless otherwise indicated within this Section

PART 2 - PRODUCTS

2.01 MATERIALS

A. Conduits and Fittings

1. Rigid steel conduit (RMC)
   a. Conduit: Standard weight, mild steel pipe, and zinc coated on both inside and outside by a hot dipping or shearardizing process manufactured in accordance with UL 6 and ANSI C80.1 specifications.
   b. Fittings (couplings, elbows, bends, etc.)
      1) Shall be steel or malleable iron.
      2) Coupling and unions shall be threaded type, assembled with anti-corrosion, conductive and anti-seize compound at joints made absolutely tight to exclude water.
   c. Bushings
      1) Insulating bushings: Threaded polypropylene or thermosetting phenolic rated at 150°C minimum.
      2) Insulating grounding bushing: Threaded cast body with insulating throat and steel "lay-in" ground lug.
      3) Insulating metallic bushing: Threaded cast body with plastic insulated throat rated at 150°C minimum.

2. Coated rigid steel conduit (CRMC)
   a. Conduit: Equivalent to RMC with a Polyvinyl chloride (PVC) coated bonded to the galvanized outer surface of the conduit. The bonding between the PVC coating and conduit surface shall be ETL PVC-001 compliant. The coating thickness shall be a minimum of 40mil.
   b. Fittings (couplings, elbows, bends, etc.)
      1) Equivalent to RMC above with bonded coating same as conduit.
      2) The PVC sleeve over fittings shall extend beyond hub or coupling approximately one diameter or 1 1/2" whichever is smaller.
   c. Bushings equivalent to RMC above.

3. Intermediate metallic conduit (IMC)
   a. Conduit: Intermediate weight, mild steel pipe, meeting the same requirements for finish and material as rigid steel conduit manufactured in accordance with UL 1242 and ANSI C80.6 specifications.
b. Fittings (couplings, elbows, bends, etc.) equivalent to RMC above.
c. Bushing equivalent to RMC above.

4. Electrical metallic tubing (EMT)
   a. Conduit: Cold rolled steel tubing with zinc coating on outside and protective enamel on inside manufactured in accordance with UL 797 and ANSI C80.3 specifications.
   b. Couplings: Steel or malleable iron with compression type fastener via a nut.
   c. Connectors: Steel or malleable iron with compression type fastener via a nut with plastic insulated throat rated at 150°C minimum.

5. Rigid non-metallic conduit (PVC)
   a. Conduit: PVC composed Schedule 40, 90°C manufactured in accordance with NEMA TC 2 and UL 651 specifications.
   b. Fittings: Molded PVC, slip on solvent welded type in accordance to NEMA TC 3.

6. Reinforced thermosetting resin conduit (RTRC)
   a. Conduit: Fiber impregnated with a cured thermosetting resin compound in accordance with NEMA TC 14 and UL1684.
   b. Fittings: Molded resin with glass reinforcement manufactured in the same process as the conduit bonded with an epoxy adhesive.

7. Flexible metallic conduit (FMC)
   a. Conduit: Continuous, flexible steel spirally wound with zinc coating on both inside and outside in accordance with UL 1.
   b. Connectors: Steel or malleable iron with compression type fastener via a nut with plastic insulated throat rated at 150°C minimum.

8. Liquidtight flexible metallic conduit (LFMC)
   a. Conduit: PVC coated, continuous, flexible steel spirally wound with zinc coating on both inside and outside in accordance with UL 360.
   b. Connectors: Steel or malleable iron with compression type fastener via a nut with plastic insulated throat rated at 150°C minimum.

9. Miscellaneous Fittings and Products
   a. Conduit sealing bushings: Steel or cast malleable iron body and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Supplied with neoprene sealing rings between body and PVC sleeve.
   b. Watertight cable terminators: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel screws and zinc plated cast iron locking collar.
   c. Watertight cable/cord connectors: Liquidtight steel or cast malleable iron body with sealing neoprene bushing and stainless steel retaining ring.
d. Expansion fittings: Multi-piece unit of hot dip galvanized malleable iron or steel body and outside pressure bussing design to allow a maximum of 4” movement (2” in either direction). Furnish with external braid tinned copper bonding jumper. UL listed for both wet and dry locations.

e. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve, internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling to provide minimum of 3/4” movement and 30 degrees deflection from normal. UL listed for both wet and dry locations.

f. Conduit bodies: Raintight, malleable iron, hot-dip galvanized body with threaded hubs, stamped steel cover, stainless steel screws and neoprene gasket.

g. Other couplings, connectors and fittings shall be equal in quality, material and construction to items specified herein.

B. Boxes

1. Outlet boxes
   a. Standard: Galvanized one-piece of welded pressed steel type in accordance with NEMA OS 1 and UL 514. Boxes shall not be less than 4” square and at least 1 1/2” deep.
   b. Concrete: Galvanized steel, 4” octagon ring with mounting lug, backplate and adapter ring type in accordance with NEMA OS 1 and UL 514. Depth as required by application.
   c. Masonry: Galvanized steel, 3.75” high gang box in accordance with NEMA OS 1 and UL 514.
   d. Surface cast metal: Cast malleable iron body, surface mounted box with threaded hubs and mounting lugs as required in accordance with NEMA OS 1 and UL 514. Furnish with ground flange, steel cover and neoprene gasket.

2. Pull and junction boxes
   a. Sheet metal boxes: Standard or concrete outlet box wherever possible; otherwise use 16 gauge galvanized sheet metal, NEMA 1 box sized per CEC with machine screwed cover.
   b. Cast metal boxes: Install standard cast malleable iron outlet or device box when possible.
   c. Flush mounted boxes: Install overlapping cover with flush head screws.
   d. In-ground mounted pull holes/boxes: Install pre-cast concrete box, sized per Drawing or CEC with pre-cast or traffic rated lid.

3. Floor boxes
   a. Floor boxes shall be adjustable, cast metal body with threaded conduit openings, adjustable rings, brass flange or Lexan ring and cover plate with threaded plug. Include provisions to accommodate surface mounted telephone or receptacle outlet, or flush floor mounted telephone or receptacle outlet where shown on Drawings.

C. Pull line/cord
PART 3 - EXECUTION

3.01 EXAMINATION

A. Thoroughly examine site conditions for acceptance of wire and cable installation to verify conformance with manufacturer and specification tolerances. Do not commence with work until all conditions are made satisfactory.

3.02 PREPARATION

A. Conduit

1. Provide all necessary conduit fittings, connectors, bushings, etc. required to complete conduit installation to meet the CEC and intended application whether noted, shown or specified within.

2. Location of conduit runs shall be planned in advance of the installation and coordinated with other trades.

3. Where practical, install conduits in groups in parallel vertical or horizontal runs that avoid unnecessary offsets.

4. All conduits shall be parallel or at right angles to columns, beams and walls whether exposed or concealed.

5. Conduits shall not be placed closer than 12” to a flue, parallel to hot water, steam line or other heat sources; or 3” when crossing perpendicular to the above said lines when possible.

6. Install exposed conduit as high as practical to maintain adequate headroom. Notify Engineer if headroom will be less than 102”.

7. Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.

8. The largest trade size conduit in concrete floors and walls shall not exceed 1/3 thickness or be spaced a less than three conduit diameters apart unless permitted by Engineer. All conduits shall be installed in the center of slab or wall, and never between reinforcing steel and bottom of floor slab.

9. Install additional pull boxes, not shown on Drawings, in sufficient quantities to facilitate pulling of conductors and cables such that total spacing does not exceed 150 feet or 270 degrees, total; and maximum pulling tension will not be exceeded.

10. When installing underground conduits to specified depth; depth shall be taken from finished grade as it will be at project completion. Should finish grade be above existing grade by an amount equal to or greater than specified depth, conduit shall be installed not less than 6” below existing grade.

11. Verify that information concerning finish grade is accurate, for should the underground run be less than the specified depth, Contractor may be required to re-install conduit to meet the required depth.
12. Unless otherwise specified, underground conduits shall be installed with top side not less than 24” below finished grade; this depth applies to all conduits outside of building foundations including those under walks, open corridors or paved areas.

13. Utility company service conduits installation depth shall be as directed by their respective specifications and requirements.

B. Boxes

1. Before locating outlet boxes, check Construction Documents for type of construction and make sure that there is no conflict with other equipment. Locate outlet boxes as shown and locate so as not to interfere with other Work or equipment.

2. Install all outlet boxes flush within walls, ceiling and floors except where installed within non-finished rooms, cabinetry, attic spaces or as indicated on Drawings.

3. Locate pull boxes and junction boxes within concealed, accessible locations where possible.

4. Do not install outlet boxes back-to-back with same stud space. Where shown back-to-back, offset as required, and fill void with sound dampening material where requested by Owner.

5. In fire rated walls separate boxes by 24” minimum and with stud member.

6. Adjust position of outlet boxes within masonry wall to accommodate course lines.

3.03 INSTALLATION

A. Conduit

1. Minimum conduit size shall be 3/4” unless otherwise indicated.

2. All conduit work shall be concealed unless otherwise indicated. Exposed conduits shall be permitted within unfinished rooms/spaces to facilitate installation.

3. Install conduit in complete runs prior to installing conductors or cables.

4. Make long radius conduits bends free from kink, indentations or flattened surfaces. Make bends carefully to avoid injury or flattening. Bends 1 1/4” size and larger shall be factory made ells, or be made with a manufactured mechanical bender. Heating of steel conduit to facilitate bending or that damage galvanized coating will not be permitted.

5. Remove burrs and sharp edges at end of conduit with tapered reamer.

6. Protect and cover conduits during construction with metallic bushings and bushing “pennies” to seal exposed openings.

7. Assemble conduit threads with anti-corrosion, conductive, anti-seize compound and tighten securely.

8. Install conduits shall that no traps to collect condensation exist.

9. Fasten conduit securely to boxes with locknuts and bushings to provide good grounding continuity.
10. Install pull cords/line within any spare or unused conduits of sufficient length to facilitate future cable installation.

11. Penetrations
   a. Locate penetrations within structural members as shown on Drawings and as directed by Engineer. Should it be necessary to notch any framing member, make such notching only at locations and in a manner as approved by Engineer.
   b. Do not chase concrete or masonry to install conduit unless specifically approved by Engineer.
   c. Cutting or holes
      1) Install sleeves for cast-in-place concrete floors and walls. After installing conduit through penetration, seal using dry-pack grouting compound (non-iron bearing, chloride free and non-shrinking) or fire rated assembly if rated floor or wall. Use escutcheon plate on floor underside to contain compound as necessary.
      2) Cut holes with a hole saw for penetrations through non-concrete or non-masonry members.
      3) Provide chrome plated escutcheon plates at all publicly exposed wall, ceiling and floor penetrations.
   d. Sealing
      1) Non-rated penetration openings shall be packed with non-flammable insulating material and sealed with gypsum wallboard taping compound.
      2) Fire rated penetration shall be sealed using a UL classified fire stop assembly suitable to maintain the equivalent fire rating prior to the penetration.
      3) Use escutcheon plates to hold sealing or fire rated compound as necessary.
   e. Waterproofing
      1) Make penetrations through any damp-proofed/waterproofed surfaces within damp/wet locations as such as to maintain integrity of surface.
      2) Install specified watertight conduit entrance seals at all below grade wall and floor penetrations.
      3) At roof penetrations furnish roof flashing, counter flashing and pitch-pockets compatible to roof assembly.
      4) Where possible conduits that horizontally penetrate a waterproof membrane shall fall away from and below the penetration’s exterior side.
      5) Make penetrations through floors watertight with mastic, even when concealed within walls or furred spaces.

12. Supports
   a. Conduits shall be support and braced per OSHPD pre-approved anchorage systems when those methods are implemented and installed.
b. Sizes of rods and cross channels shall be capable of supporting 4 times and 5 times actual load, respectively. Anchorage shall support the combined weight of conduit, hanger and conductors.

c. Support individual horizontal conduit 1 1/2" and smaller by means of 2 hole straps or individual hangers.

d. Galvanized iron hanger rods sizes 1/4” diameter and larger with spring steel fasteners, clips or clamps specifically design for that purpose for 1 1/2" conduits and larger.

e. Support multi-parallel horizontal conduits runs with trapeze type hangers consisting of 2 or more steel hanger rods, preformed cross channels, ‘J’ bolts, clamps, etc.

f. Support conduit to wood structures by means of bolts or lag screws in shear, to concrete by means of insert or expansion bolts and to brickwork by means of expansion bolts.

g. Support multi-parallel vertical conduits runs with galvanized Unistrut, Power-Strut or approved equal type supports anchored to wall. Where multi-floored conduits pass through floors, install riser clamps at each floor.

h. Maximum conduit support spacing shall be in accordance with NECA Standard of Installation:

1) Horizontal runs:
   a) 3/4” and smaller at 60” on centers, unless building construction prohibits otherwise, then 84” on centers.
   b) 1” and larger at 72” on centers, unless building construction prohibits otherwise or any other condition, then 120” on centers.

2) Vertical runs:
   a) 3/4” and smaller @ 84” on centers.
   b) 1” and 1 1/4” @ 96” on centers.
   c) 1 1/2” and larger @ 120” on centers.
   d) Any vertical condition such as shaftways and concealed locations for any sized conduit, 120” on centers.

i. Anchorage for RMC/IMC supports unless otherwise specified:

1) < 1” IMC/RMC = #10 bolt/screw.
2) 1” IMC/RMC = 1/4” bolt/screw.
3) 1 1/2” and 2” IMC/RMC = 3/8” bolt/screw.
4) 3” IMC/RMC, 4” EMT = 1/2” bolt/screw.
5) > 3”IMC/RMC = 5/8” bolt/screw.

j. Anchorage for EMT supports unless otherwise specified:

1) < 1 1/2” EMT = #10 bolt/screw.
2) 1 1/2” EMT = 1/4” bolt/screw.
3) 2, 2 1/2" and 3" EMT = 3/8" bolt/screw.
4) 4" EMT = 1/2" bolt/screw.
5) > 4" EMT = 5/8" bolt/screw.

B. Boxes

1. Install boxes as shown on Drawings and as required for splices, taps, wire pulling, equipment connections and Code compliance.

2. Install additional pull boxes, not shown on Drawings, in sufficient quantities to facilitate pulling of conductors and cables such that total spacing does not exceed 150 feet or 270 degrees, total; and maximum pulling tension will not be exceeded.

3. Install plaster rings on all outlet boxes in stud walls or in furred, suspended or exposed ceilings. Covers shall be of a depth suited for installation.

4. Provide gasketed cast metal cover plates where boxes are exposed in damp or wet locations

5. Install access door for boxes installed within concealed locations without access.

6. Install approved factory made knockout seal where knockouts are not present.

7. Refer to Architectural interior elevations and details shown for exact mounting heights of all electrical outlets. In general, locate outlets as shown or specific and complies with Americans with Disabilities Act:
   a. Convenience outlets: +18"AFF or +6" above counter or splash.
   b. Local switches: +48"AFF or +6" above counter or splash.
   c. Telecommunication outlets: +18"AFF or +48"AFF for wall telephone or intercom device.
   d. Verify all mounting heights with Drawings, and where heights are not suited for construction or finish please consult Engineer.

8. Use conduit bodies to facilitate pulling of conductor or cables or change conduit direction. Do not splice within conduit bodies.

9. Enclose pull box with additional rated gypsum board as necessary to maintain wall's original fire rating.

10. Install galvanized steel coverplates on all open boxes within dry listed areas.

11. Install in-ground pull holes/boxes flush to grade finish at finished areas or 1" above finished landscaped grade. Seal all conduits terminating in pull hole/box watertight. Install and grout around bell ends where shown. Cover and lids shall be removable without damage to adjacent finish surfaces.

12. Support
   a. Accurately place boxes for finish, independently and securely supported by adequate blocking or manufacturer channel type heavy-duty box hangers for stud walls. Do not use nails to support boxes.
   b. Support boxes independent of conduit system.
c. Mount boxes installed within ceilings to 16 gauge metal channel bars attached to main runners or joists.

d. Support boxes within suspended acoustical tile ceilings directly from structure above when light fixture are to be installed from box.

e. Use auxiliary plates, bar or clips and grouted in place for masonry, block or pour-in-place concrete construction.

3.04 APPLICATION

A. Conduit

1. RMC/IMC suitable for all damp, dry and wet locations except when in contact with earth. IMC not suitable for hazardous locations as stated within CEC.

2. CRMC suitable for damp or wet locations, concealed within concrete or in contact with earth.

3. EMT suitable for exposed or concealed dry, interior locations.

4. PVC/RTRC suitable for beneath ground floor slab, except when penetrating, and direct earth burial. Do not run exposed within concrete walls or in floor slab unless indicated on Drawings or per Engineer’s permission.

5. FMC suitable for dry locations only for connections to motors, transformers, vibrating equipment/machinery, controllers, valves, switches and light fixtures in less than 6 foot lengths.

6. LFMC application same as FMC above but for damp or wet locations.

B. Termination and joints

1. Use raceway fittings compatible with associated raceway and suitable for the location.

2. Raceways shall be joined using specified couplings or transitions where dissimilar raceway systems are joined.

3. Conduits shall be securely fastened to cabinets, boxes and gutters using (2) two locknuts and insulating bushing or specified insulated connector. Where joints cannot be made tight and terminations are subject to vibration, use bonding jumpers, bonding bushings or wedges to provide electrical continuity of the raceway system. Use insulating bushings to protect conductors where subjected to vibration or dampness. Install grounding bushings or bonding jumpers on all conduits terminating at concentric or eccentric knockouts.

4. Terminations exposed at weatherproof enclosures and cast outlet boxes shall be made watertight using specified connectors and hubs.

5. Stub freestanding equipment conduits through concrete floors for connections with top of coupling set flush with finished floor. Install plugs to protect threads and entrance of debris.

6. Install specified cable sealing bushings on all conduits originating outside the building walls and terminating within interior switchboard, panel, cabinet or gutters. Install cable sealing bushings or raceway seal for conduit terminations in all grade level or below grade exterior pull, junction or outlet boxes.
7. Where conduits enter building from below grade inject into filled raceways pre-formulated rigid 2 lbs. density polyurethane foam suitable for sealing against water, moisture, insects and rodents.

8. Install expansion fitting or expansion/deflection couplings per manufacturer’s recommendations where:
   a. Any conduit that crosses a building structure expansion joint; secure conduit on both sides to building structure and install expansion fitting at joint.
   b. Any conduit that crosses a concrete expansion joint; install expansion/deflection at joint.
   c. Any conduit greater than 1-1/4” is routed along roof top in runs greater than 100 feet; install expansion fittings every 100 feet.
   d. Engineer may allow FMC or LFMC in lieu of expansion fitting or expansion/deflection couplings on conduits 2” and smaller within accessible locations upon further review and written consent.

C. Boxes

1. Standard type suitable for all flush installations and all dry concealed locations.
2. Concrete type suitable for all flush concrete installations.
3. Masonry type suitable for all flush concrete and block installations.
4. Surface cast meta type suitable for all exposed damp and wet surface mounted locations, and dry surface mounted locations less than 96” from finished floor

END OF SECTION
SECTION 26 05 53

ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes requirements for:
   1. Identifying electrical, instrumentation, and process equipment and components.

B. Related Sections:
   1. Contract Documents are a single integrated document, and as such all Divisions and Sections apply. It is the responsibility of the CONTRACTOR and its subcontractors to review all sections to ensure a complete and coordinated project.

1.02 REFERENCES

A. Refer to Section 26 05 00.

1.03 DEFINITIONS

A. Refer to Section 26 05 00.

1.04 SYSTEM DESCRIPTION

A. Nameplates:
   1. Provide a nameplate for each control device or major item of electrical equipment, either located in the field or within panels.
   2. Provide all nameplates of identical style, color, and material throughout the facility.
   3. Device nameplates information:
      a. Designations as indicated on the Drawings and identified on the Process and Instrumentation Drawings.
      b. Device tag and loop number ID (e.g. EDV-60.0101.01).
      c. Circuit ID (e.g. LPA-11).
      d. Area served (e.g. Lighting Chemical Building).

B. Wire Numbers:
   1. Coordinate the wire numbering system with all vendors of equipment so that every field wire has a unique number associated with it for the entire system:
      a. Wire numbers shall correspond to the wire numbers on the control drawings or the panel and circuit numbers for receptacles and lighting.
      b. Wire numbers shall correspond to the terminal block number to which they are attached in the control panel.
      c. Internal panel wires on a common terminal shall have the same wire
d. All instrumentation cables shall be identified at pull points as described above.

2. Provide the following wiring numbering schemes throughout the project for field wires between Process Control Module, (PCM), Vendor Control Panels, (VCP), Motor Control Centers, (MCC), field starters, field instruments, etc.

\[(\text{ORIGIN LOC.})-(\text{ORIGIN TERM.})/(\text{DEST. LOC.})-(\text{DEST. TERM.})\]

Where:

- ORIGIN LOC. = Designation for originating panel or device
- ORIGIN TERM. = Terminal designation at originating panel or device
- DEST. LOC. = Designation for destination panel or device
- DEST. TERM. = Terminal designation at destination panel or device or PLC I/O address at destination panel

a. Identify equipment and field instruments as the origin.
b. PCM's are always identified as the destination.
c. Location is the panel designation for VCP, LCP, or PCM. For connections to MCC's, location is the specific starter tag and loop number. Location is the tag and loop number for motor starters, field instruments and equipment. Any hyphen in the panel designation or tag and loop number shall be omitted.
d. Terminal designation is the actual number on the terminal block where the conductor terminates at field devices and vendor control panels. For multiconductor cables, all terminal numbers shall be shown, separated by commas.
e. Terminal designations at motor leads shall be the motor manufacturer's standard terminal designation (e.g., T1, T2, T3, etc.).
f. Terminal designations at PCM's where the field conductor connects to a PLC input or output shall be the PLC address (Note: the following PLC I/O numbering scheme is typical for Allen Bradley, the numbering scheme should be modified to match that of the actual PLC manufacturer used for the project):
   1) Discrete Point: W:X:Y/Z
      Analog Point: W:X:Y,Z

   Where:
   - W = I for input, O for output
   - X = PLC number (1, 2, 3…)
   - Y = Slot number (01, 02, 03…)
   - Z = Terminal number (00, 01, 02…) for a discrete point
      or a word number for an analog point (1, 2, 3…)
g. Terminal designations at PCM's where the conductor does not connect to a PLC I/O point shall be the terminal number with a “C” prefix (e.g., 010). For common power after a fuse or neutrals after a...
switch, the subsequent points shall have and capital letter suffix starting with “A” (e.g., C0010A).

3. **Case 1:** Vendor Control Panel (VCP) to Process Control Module (PCM):
   
   Field Wire Number/Label: A-B/C-D  
   
   A = Vendor Control Panel number without hyphen (VCP60.0101.01)  
   B = Terminal number within VCP (manufacturer’s or vendor’s standard terminal number)  
   C = Process Control Module number without hyphen (PCM60.0101)  
   D = Either the PLC address if the field terminal is connected directly to a PLC input or output point or the terminal number with a “C” prefix if not connected directly to a PLC I/O point (C0010)  
   
   Examples: VCP60.0101.01-10/PCM60.0101-I:1:01/01  
              VCP60.0101.01-10/PCM60.0101-O:1:10/07  
              VCP60.0101.01-10/PCM60.0101-C0100

4. **Case 2:** Field Instrument to Process Control Module (PCM): Field Wire Number/Label: E-F/C-D  
   
   C = Process Control Module number without hyphen (PCM60.0101)  
   D = Either the PLC address if the field terminal is connected directly to a PLC input or output point or the terminal number with a “C” prefix if not connected directly to a PLC I/O point (C0010)  
   E = Field mounted instrument tag and loop numbers without hyphen (EDV60.0101.01)  
   F = Manufacturer’s standard terminal number within instrument. Use both terminal numbers for analog points separated by a comma  
   
   Examples: TIT60.0101.01-2,3/PCM60.0101-I:1:01.1  
              TSH60.0101-1/PCM60.0101-I:2:01/00

5. **Case 3:** Motor Control Center (MCC) to Process Control Module (PCM): Field Wire Number/Label: G-B/C-D  
   
   B = Terminal number within Motor Control Center (manufacturer’s or vendor’s standard terminal number)  
   C = Process Control Module without hyphen (PCM60.0101)  
   D = Either the PLC address if the field terminal is connected directly to a PLC input or output point or the terminal number with a “C” prefix if not connected directly to a PLC I/O point (C0010)  
   G = Actual starter designation in the Motor Control Center without hyphen (MMS60.0101)  
   
   Examples: MMS60.0101-10/PCM60.0101-I:1:01/01  
              MMS60.0101-10/PCM60.0101-O:1:10/07  
              MMS60.0101-10/PCM60.0101-C0100

6. **Case 4:** Motor Control Center (MCC) to Vendor Control Panel (VCP): Field Wire Number/Label: G-B/A-B  
   
   A = Vendor Control Panel number without hyphen (VCP60.0101.01)  
   B = Terminal number within motor control center or vendor control panel (manufacturer’s or vendors standard terminal number)
G = Actual starter designation in the Motor Control Center without hyphen (MMS60.0101)

Example: MMS60.0101-X2/VCP60.0101.01-10

7. **Case 5**: Motor leads to a Motor Control Center (MCC): Field Wire Number/Label: H-I/G-B
   - B = Terminal number within motor control center (manufacturer’s standard terminal number)
   - G = Actual starter designation in the Motor Control Center without hyphen (MMS60.0101)
   - H = Equipment tag and loop number without hyphen (PMP60.0101.01)
   - I = Motor manufacturer’s standard motor lead identification (e.g. T1, T2, T3, etc.)

   Example: PMP-60.0101.01-T3/MMS60.0101.01-T3

8. **Case 6**: Remote or separately mounted starter or Variable Frequency Drive (VFD) to Process Control Module (PCM): Field Wire Number/Label: J-B/C-D
   - B = Terminal number within starter or Variable Frequency Drive (manufacturer’s standard terminal number)
   - C = Process Control Module number without hyphen (VCP60.0101.01)
   - D = Either the PLC address if the field terminal is connected directly to a PLC input or output point or the terminal number with a “C” prefix if not connected directly to a PLC I/O point (C0010)
   - J = Starter or Variable Frequency Drive tag and loop number without hyphen (MMS60.0101)

   Examples: MMS60.0101-10/PCM60.0101.01-I:1:01/01
              MMS60.0101-10/PCM60.0101.01-O:2:10/07
              MMS60.0101-10/PCM60.0101.01-C0010

9. Terminate all spare conductors on terminal blocks and identify as required for other field wires with an “S” prefix:
   Example: S MMS60.0101-10/PCM60.0101.01-C011

1.05 **SUBMITTALS**

A. Furnish submittals in accordance with Section 26 05 00.

B. Product Data:
   1. Nameplates:
      a. Color.
      b. Size:
         1) Outside dimensions.
         2) Lettering.
      c. Material.
      d. Mounting means.
   2. Nameplate Schedule:
a. Show exact wording for each nameplate.
b. Include nameplate and letter sizes.

3. Wire numbers:
   a. Manufacturer’s catalog data for wire labels and label printer.

C. Record Documents:
   1. Update the conduit schedule to reflect the exact quantity of wire numbers including spares and destination points for all wires.

1.06 QUALITY ASSURANCE

A. Schedule a pre-installation conference in accordance with Section 26 05 00 in order to clearly define the requirements specified for equipment identification:
   1. Representatives of the CONTRACTOR, OWNER, and ENGINEER shall convene before any major purchases of cable or conductors and before the installation or termination of any cables or conductors.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 26 05 00.

1.08 WARRANTY

A. Refer to Section 26 05 00.

1.09 SYSTEM START UP

A. Refer to Section 26 05 00.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nameplates and Signs:
   1. One of the following or equal:
      a. Brady.
      b. Seton.

B. Conductor and Cable Markers:
   1. Heat-shrinkable tubing:
      a. One of the following or equal:
         1) Raychem.
         2) Brady.
         3) Thomas & Betts.
         4) Kroy.

C. Conduit and Raceway Markers:
   1. One of the following or equal:
b. Lapp Group: Maxi System

D. Medium Voltage Raceway Voltage Labels:
   1. One of the following or equal:
      a. Brady.
      b. Seton.

2.02 MATERIALS

A. Nameplates:
   1. Fabricated from white-center and red or black face laminated plastic engraving stock:
      a. 3/32-inch thick material.
      b. Two-ply.
      c. With chamfered edges.
      d. Block style engraved characters of adequate size to be read easily from a distance of 6 feet:
         1) No characters smaller than 1/8-inch in height.

B. Signs:
   1. Automatic equipment and high voltage signs:
      a. Suitable for exterior use.
      b. In accordance with OSHA regulations.

C. Conductor and Cable Markers:
   1. Machine printed black characters on white tubing.
   2. Ten point type or larger.

D. Conduit and Raceway Markers:
   1. UV resistant holder and letters.
   2. Black letters on yellow background.
   3. Minimum 1/2-inch high letters.

E. Medium Voltage Circuit Raceway Labels:
   1. Vinyl plastic.
   2. Minimum 1-inch high letters.

2.03 SOURCE QUALITY CONTROL

A. Nameplates:
   1. Provide all nameplates for control panel operator devices (e.g. pushbuttons, selector switches, pilot lights, etc.):
      a. Same material and same color and appearance as the device nameplates, in order to achieve an aesthetically consistent and coordinated system.

PART 3 EXECUTION

3.01 INSTALLATION

A. Refer to Section 26 05 00.
B. Nameplates:
1. Attach nameplates to equipment with rivets, bolts or sheet metal screws, approved waterproof epoxy-based cement or install in metal holders welded to the equipment.
2. On NEMA 4 or NEMA 4X enclosures, use epoxy-based cement to attach nameplates.
3. Nameplates shall be aligned and level or plumb to within 1/64 inch over the entire length:
   a. Misaligned or crooked nameplates shall be remounted, or provide new enclosures at the discretion of the ENGINEER.

C. Conductor and Cable Markers:
1. Apply all conductor and cable markers before termination.
2. Heat-shrinkable tubing:
   a. Tubing shall be shrunk using a heat gun that produces low temperature heated air.
   b. Tubing shall be tight on the wire after it has been heated.
   c. Characters shall face the open panel and shall read from left to right or top to bottom.
   d. Marker shall start within 1/32 inch of the end of the stripped insulation point.

D. Conduit Markers:
1. Furnish and install conduit markers for every conduit in the electrical system that is identified in the conduit schedule or part of the process system:
   a. Conduit markings shall match the conduit schedule; refer to Section 26 05 53.
2. Mark conduits at the following locations:
   a. Each end of conduits that are greater than 10 feet in length.
   b. Where the conduit penetrates a wall or structure.
   c. Where the conduit emerges from the ground, slab, etc.
   d. The middle of conduits that are 10 feet or less in length.
3. Mark conduits after the conduits have been fully painted.
4. Position conduit markers so that they are easily read from the floor.
5. Secure all conduit markers with nylon cable ties:
   a. Provide with ultraviolet resistant cable ties for conduit markers exposed to direct sunlight.
   b. Adhesive labels are not acceptable.
6. Mark conduits before construction review by ENGINEER for punch list purposes.

E. Medium Voltage Raceway Labels:
1. Apply at 50 foot intervals stating the voltage level contained within the raceway.

F. Signs and Labeling:
1. Furnish and install permanent warning signs at mechanical equipment that may be started automatically or from remote locations:
   a. Fasten warning signs with round head stainless steel screws or bolts.
b. Locate and mount in a manner to be clearly legible to operations personnel.

2. Furnish and install permanent and conspicuous warning signs on equipment (front and back), doorways to equipment rooms, pull boxes, manholes, etc. where the voltage exceeds 600 volts.

3. Furnish and install warning signs on equipment that has more than one source of power.
   a. Warning signs to identify every panel and circuit number of the disconnecting means of all external power sources.

4. Place warning signs on equipment that has 120 VAC control voltage source used for interlocking.
   a. Identify panel and circuit number or conductor tag for control voltage source disconnecting means.

3.02 FIELD QUALITY CONTROL

A. Replace any nameplates, signs, conductor markers, cable markers, or raceway labels that in the sole opinion of the ENGINEER do not meet the ENGINEER’s aesthetic requirements.

END OF SECTION
SECTION 26 05 73

ELECTRICAL SYSTEM STUDIES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes requirements for:
   1. Short Circuit Fault Analysis Study.
   2. Protective Device Coordination Study.
   3. Arc-Flash Hazard Study.

B. Related Sections:
   1. Contract documents are a single integrated document, and as such all
divisions and sections apply. It is the responsibility of the CONTRACTOR
and its subcontractors to review all sections to ensure a complete and
coordinated project.

1.02 REFERENCES

A. Refer to Section 26 05 00.

B. Institute of Electrical and Electronics Engineers (IEEE):
   1. 141 - IEEE Recommended Practice for Electric Power Distribution for
      Industrial Plants (Red Book).
   2. 242 - IEEE Recommended Practice for Protection and Coordination of
      Industrial and Commercial Power Systems (Buff Book).
   3. 399 - IEEE Recommended Practice for Industrial and Commercial Power
      Systems Analysis (Brown Book).
   4. 1015 - IEEE Recommended Practice for Applying Low Voltage Circuit
      Breakers Used in Industrial and Commercial Power Systems - Corrigendum 1
      (Blue Book).
   6. 315 - IEEE Standards Electrical and Electronics Graphic and Letter
      Symbols and Reference Designations.
   7. 902 - IEEE Guide for Maintenance, Operation and Safety on Industrial and
      Commercial Power Systems (Yellow Book).

C. National Fire Protection Association (NFPA):
   1. 70E - Standard for Electrical Safety in the Workplace.

1.03 DEFINITIONS

A. Refer to Section 26 05 00.
1.04 SYSTEM DESCRIPTIONS

A. The Study shall be performed under the direction of a licensed Professional Engineer in good standing with the California Board for Professional Engineers and Land Surveyors.

B. General study requirements:
   1. Scope:
      a. The short-circuit fault analysis, protective device coordination and arc-flash hazard studies shall include all equipment in the power distribution system including but not limited to:
         1) Utility equipment.
         2) Switchgear.
         3) Generators.
         4) Transformers:
            a) Including all dry-type transformers.
         5) Motor Control Centers.
         6) Free standing variable frequency drives and starters.
         7) Disconnect Switches.
         8) Motors.
         9) Panelboards:
            a) Including all 240 and 208 volt systems.
         10) Vendor Control Panels.
         11) HVAC Equipment.
      b. Study Scenarios:
         1) The studies shall include all possible electrical system configurations, for example:
            a) Operation on normal (utility) source.
            b) Operation on generator source.
            c) Main-breakers closed, tie breaker open.
            d) Either main-breaker open, tie breaker closed.
   2. Obtain, for all equipment, the required data for preparation of the study, including, but not limited to:
      a. Transformer kilovolt-ampere and impedances.
      b. Generator impedances.
      c. Generator decrement curves.
      d. Bus withstand ratings.
      e. Cable and bus data.
      f. Protective device taps, time dials, instantaneous pickups, and time delay settings.
   3. Obtain the Electric Utility information on the minimum and maximum available fault current, minimum and maximum utility impedances, utility protective device settings including manufacturer and model number, interrupting ratings, X/R ratios, and model information one level above the point of connection:
      a. Utility tolerances and voltage variations.
   4. The individual performing the studies shall visit the site and collect all necessary field data in order to perform and complete comprehensive electrical system studies.
   5. Obtain equipment layouts and configurations from the manufacturer's final
submittal requirements and project layout drawings as required.

6. Bus and conductor data:
   a. Use impedances of the actual installed or specified conductors, unless otherwise indicated.
   b. Use cable and bus impedances calculated at 25 degrees Celsius, unless otherwise indicated.
   c. Use 600-volt cable reactance based on typical dimensions of actual installed or specified conductors, unless otherwise indicated.
   d. Use bus withstand values for all equipment having buses.
   e. Use medium voltage cable reactances based on typical dimensions of shielded cables with 133 percent insulation levels, unless otherwise indicated.

7. Motors:
   a. Each motor shall be individually modeled:
      1) Grouping of motors for fault contribution current is not acceptable.
   b. Motors with variable frequency drives may be assumed to have no contribution to fault current.

8. Use the equipment, bus, and device designations as indicated on the Drawings for all studies.

C. Short-circuit fault analysis study additional requirements:
   1. The short-circuit fault analysis shall be performed and submitted in 2 phases:
      a. Initial short-circuit fault analysis:
         1) Based on the Contract Documents and Electric Utility information.
         2) The initial short-circuit fault analysis report shall indicate the estimated available short-circuit current at the line side terminals of each piece of equipment covered by the scope of the study.
         3) Provide a list of assumptions used in the initial study.
      b. Final short-circuit analysis:
         1) The final short-circuit fault analysis shall modify the initial analysis as follows:
            a) Utilize the actual equipment provided on the project.
            b) Utilize conductor lengths based on installation.
      2. Calculate 3-phase bolted fault, line-to-line fault, line-to-ground fault, double line-to-ground fault, short-circuit 1/2 cycle momentary symmetrical and asymmetrical RMS, 1-1/2 and 4 cycle, interrupting symmetrical RMS, and 30 cycle steady state short circuit current values at each piece of equipment in the distribution system.
      3. Evaluate bus bracing, short circuit ratings, fuse interrupting capacity and circuit breaker adjusted interrupting capacities against the fault currents, and calculate X/R values:
         a. Identify and document all devices and equipment as either inadequate or acceptable.
      4. Calculate line-to-ground and double line-to-ground momentary short circuit values at all buses having ground fault devices.
      5. Provide calculation methods, assumptions, one-line diagrams, and source impedance data, including Utility X/R ratios, typical values, recommendations, and areas of concern.

D. Protective device coordination study additional requirements:
   1. Furnish protective device settings for all functions indicated on the
Drawings, including, but not limited to:


b. Voltage:
   1) Provide settings for all voltage relays based upon actual Utility and generator tolerances and specifications.

c. Frequency:
   1) Provide settings for all frequency relays based upon actual Utility and generator tolerances and specifications.

d. Negative sequence.

e. Reverse power.

f. Machine protection functions:
   1) Provide settings for all motor and generator protective relays based on the manufacturer’s recommended protection requirements.

2. Provide log-log form time-current curves (TCC’s) graphically indicating the coordination proposed for the system:

   a. Include with each TCC a complete title and one-line diagram with legend identifying the specific portion of the system covered by the particular TCC:
      1) Typical time-current curves for identical portions of the system, such as motor circuits, are acceptable as allowed by the ENGINEER.

   b. Include a detailed description of each protective device identifying its type, function, manufacturer, and time-current characteristics:
      1) These details can be included on the TCC.

   c. Include a detailed description of each protective device tap, time dial, pickup, instantaneous, and time delay settings:
      1) These details can be included in the TCC.

3. TCC’s shall include all equipment in the power distribution system where required to demonstrate coordination. Include Utility relay and fuse characteristics, medium voltage equipment protective relay and fuse characteristics, low-voltage equipment circuit breaker trip device characteristics, transformer characteristics, motor and generator characteristics, and characteristics of other system load protective devices:

   a. Include all devices down to the largest branch circuit and largest feeder circuit breaker in each motor control center, main breaker in branch panelboards and fused disconnect switches.

   b. Provide ground fault TCC’s with all adjustable settings for ground fault protective devices.

   c. Include manufacturing tolerances and damage bands in plotted fuse and circuit breaker characteristics.

   d. On the TCC’s show transformer full load currents, transformer magnetizing inrush, ANSI transformer withstand parameters and transformer damage curves.

   e. Cable damage curves.

   f. Terminate device characteristic curves at a point reflecting the maximum symmetrical or asymmetrical fault current to which the device is exposed based on the short-circuit fault analysis study.

   g. Coordinate time interval medium-voltage relay characteristics with upstream and downstream device to avoid nuisance tripping.

4. Site Generation: When site generation (including cogeneration, standby, and emergency generators) is part of the electrical system, include phase and ground coordination of the generator protective devices:
a. Show the generator decrement curve and damage curve along with the operating characteristic of the protective devices.

5. Suggest modifications or additions to equipment rating or settings in a tabulated form.

E. Arc-Flash Hazard Study Additional Requirements:
1. Include the calculated arc-flash boundary and incident energy (calories/square centimeter) at each piece of equipment in the distribution system:
   a. Perform Arc-flash calculations for both the line side and load side of switchgear, motor control center and panelboard main breakers.
   b. Perform arc-flash calculations for all short-circuit scenarios with all motors on for 3 to 5 cycles and with all motors off.
   c. Protective device clearing time shall be limited to 2 seconds, maximum.
2. Provide executive summary of the study results.
3. Provide a detailed written discussion and explanation of the tabulated outputs.
4. Provide alternative device settings to allow the OWNER to select the desired functionality of the system:
   a. Identify the arc-flash energy based upon the criteria of maintaining coordination and selectivity of the protective devices.
5. Perform the arc flash study calculations using both IEEE 1584 and NFPA 70E.
   Provide both studies in the final report. Provide summary based upon worst case results between IEEE 1584 and NFPA 70E.
6. Perform study with 15 percent arcing fault variation as defined by IEEE 1584.
7. Perform arc-flash scenarios at minimum and maximum utility and generator fault contributions.

F. Electrical system study meetings:
1. The individual conducting the short circuit analysis, protective device coordination, and the arc-flash hazard studies shall meet with the OWNER and ENGINEER 3 times.
2. The purpose of the 3 meetings is as follows:
   a. Initial meeting:
      1) Meet with the OWNER and ENGINEER to discuss the scope of the studies.
      2) Discuss the OWNER’s operational requirements for both normal operation and maintenance.
   b. Preliminary results meeting:
      1) This meeting will be held after the studies have been completed, reviewed, and accepted by the ENGINEER.
      2) The purpose of this meeting is to inform the OWNER of the results of the study and impacts on normal operation and maintenance including:
         a) Protective device coordination problems and recommended solutions.
         b) Explanation of the arc-flash study results and its potential impact on operations.
         c) Recommendations for reduction of arc-flash category levels including reduction of protective device settings or changes in operational practices.
c. Final meeting:
   1) Discuss changes to the reports based on the previous meeting.
   2) Discuss with the OWNER how changes to the electrical system may change the arc-flash hazard category.
   3) Deliver the final electrical system studies report.

3. The meetings will be at the OWNER’s facility:
   a. Provide a minimum of 3 weeks’ notice to the OWNER and ENGINEER in advance of the projected meeting date.
   b. Submit a draft of the meeting agenda when each meeting is requested.

4. Meeting materials:
   a. Prepare and provide the following materials:
      1) Meeting agenda. Include at a minimum the scope of the meeting, estimated time length for the meeting and meeting goals.
      2) 6 copies of the project one-line diagrams for the initial meeting.
      3) 6 copies of the studies of the submitted study.

G. By virtue of the fact that this is a professional study the OWNER reserves the right to modify the requirements of the study to comply with its operational requirements. The protective device coordination study and the arc-flash study shall be modified based on the results of the meetings with the OWNER.

1.05 SUBMITTALS

A. Furnish submittals in accordance with Section 26 05 00.

B. Initial Studies and Reports:
   1. Include the following in the initial short circuit current report:
      a. List of all devices included in the studies.
      b. A description of all operating scenarios.
      c. Form and format of arc flash labels.

C. Final Studies and Reports:
   1. Format and Quantity:
      a. Provide 6 bound copies of all final reports.
      b. Provide 3 complete sets of electronic files on CD or DVD media, including electrical system model(s), configuration files, custom libraries, any other files used to perform the studies and produce the reports. Also provide an electronic version of the bound reports in PDF format.
   2. Include the sections below in the final report:
      a. Copies of correspondence and data obtained from the Electric Utility Company.
      b. Letter certifying the inspection and verification of existing equipment.
      c. One-line diagrams:
         1) The following information shall be included at a minimum:
            a) Motor horsepower.
            b) Transformer data:
               (1) KVA.
               (2) Configuration.
            c) Cable Data:
               (1) Insulation.
               (2) Size.
County of Tulare  
Water System Improvements for Yettem & Seville

(3) Length.

2) One-line diagrams shall be fully legible at 11-inch by 17-inch size.

d. Include in the short-circuit fault analysis study:
   1) Descriptions, purpose, basis, assumptions, recommendations, and scope of the study.
   2) Normal system connections and those, which result in maximum fault conditions.
   3) Tabulation of circuit breaker, fuse, and other protective device ratings compared to maximum calculated short-circuit duties.
   4) Fault current calculations for the cases run including a definition of terms and guide for interpretation of computer software printouts.

e. Protective device coordination study shall include:
   1) Descriptions, purpose, basis, assumptions, recommendations, and scope of the study.
   2) List all requirements used in the selection and setting criteria for any protective devices.
   3) Manufacturer’s time-current curves for circuit breakers, fuses, motor circuit protectors, and other protective devices for all new equipment.
   4) Time-current curves (TCC’s) graphically indicating the coordination proposed for the system on log-log graphs. At least 3 of the copies shall be in color.
   5) Tabulation of relay, fuse, circuit breaker, and other protective devices in graphical form with a one-line diagram to display area coordination.
   6) Where coordination could not be achieved, an explanation shall be included in the report to support the statement along with recommendations to improve coordination. Recommended equipment modifications or settings shall be in a tabulated form.

f. Include in the arc-flash study:
   1) Descriptions, purpose, basis, assumptions, recommendations, and scope of the study.
   2) Normal system connections and those, which result in maximum arc-flash conditions.
   3) Arc-flash raw data, calculations, and assumptions.
   4) Arc-flash label data:
      a) Identifying the content of each label.
      b) Identifying the location of each label.

D. Certification:
   1. Submit written certification, sealed, and signed by the professional engineer conducting the study, equipment supplier, and electrical subcontractor stating that the data used in the study is correct.

E. Submit the credentials of the individual(s) performing the study and the individual in responsible charge of the study.

F. The ENGINEER will review all studies and reports. After review, the ENGINEER will make recommendations and/or require changes to be made to the short-circuit analysis, protective device coordination or arc-flash studies. These changes shall be provided as part of the scope of work.
G. Submit course outline for OWNER’S training.

1.06 QUALITY ASSURANCE

A. Refer to Section 26 05 00.

B. Qualifications of the entity responsible for electrical system studies:
   1. The studies shall be performed, stamped, and signed by a Professional Engineer registered in the state where the project is located.
   2. A minimum of 5 years’ experience in power system analysis is required for the individual in responsible charge of the studies.
   3. The short-circuit analysis, protective device coordination, and arc-flash hazard studies shall be performed with the aid of a digital computer program:
      a. Point-to-point calculations are not acceptable.

C. The study shall be performed by an independent firm.

1.07 SEQUENCING

A. Submit the initial short-circuit analysis study before submittal of any electrical equipment.

B. Submit the final short-circuit analysis and protective device coordination studies.

C. First arc-flash meeting.

D. Submit the arc-flash hazard study.

E. Second arc-flash meeting.

F. Third arc-flash meeting and final reports.

G. Label equipment with approved arc flash labels.

H. OWNER's training.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Electrical system study software one of the following or equal:
   1. ETAP by Control Technologies.
   2. SKM.

2.02 COMPONENTS

A. Arc-Flash Hazard Labels:
   1. Dimensions:
      a. Minimum 5 inches by 3.5 inches.
   2. Materials:
a. Polyester with polyvinyl polymer over-laminate.
b. Self-adhesive.
c. Resistant to:
   1) UV.
   2) Chemicals and common cleaning solvent resistant.
   3) Scuffing.
   4) Wide temperature changes.

3. Contents:
   a. Short-circuit bus identification.
   b. Calculated incident energy (calories/square centimeter) range.
   c. Hazard/risk, personnel protective equipment category number.
   d. Arc-flash protection boundary.
   e. Shock Hazard Boundary:
      1) The CONTACTOR may provide separate labels for indication of the
         shock hazard boundary.
   f. Description of the combined level of personnel protective equipment.

4. Color Scheme:
   a. For locations above 40 calories/square centimeter:
      1) White label with red “DANGER” strip across the top.
      2) Black lettering.
   b. For locations below 40 calories/square centimeter:
      1) White label with orange “WARNING” strip across the top.
      2) Black lettering.

PART 3 EXECUTION

3.01 INSTALLATION

A. Refer to Section 26 05 00:

B. After review and acceptance of the arc-flash hazard study by the ENGINEER, install all arc-flash hazard labels:
   1. Install labels at all locations required by NFPA, ANSI, or IEEE standards.
   2. At a minimum install labels in the following locations:
      a. The front of each main or incoming service compartment.
      b. The front of each low voltage switchgear section.
      c. The front of each medium voltage circuit breaker door.
      d. The front of each accessible auxiliary or conductor compartment.
      e. Each accessible rear or side vertical section.
      f. Each motor control center compartment.
      g. Each panelboard covered by the study.
      h. Each control panel, individual starter or VFD or other equipment covered by the scope of the study.
   3. Install labels prior to equipment energization.

C. After review and acceptance of the arc-flash hazard study and coordination study by the ENGINEER, adjust protective device settings per final study prior to equipment energization.
   1. Devices which require power for configuration may be set during energization, but before any subfed loads are energized.
2. Ensure that settings for upstream, existing equipment are set prior to energizing new downstream devices.

3.02 FIELD QUALITY CONTROL

A. Refer to Section 26 05 00.

B. The individual performing the arc-flash hazard study shall direct the installation of the arc-flash hazard labels:
   1. Remove and replace any improperly applied labels.
   2. Repair the equipment finish damaged by removal of any label.
   3. Install labels to within 1/64 inch of level or plumb across the entire dimension of the label.

3.03 ADJUSTING

A. After review and acceptance of the recommended settings in the Protective Device Coordination Study, make settings in accordance with the manufacturer’s instructions.

3.04 DEMONSTRATION AND TRAINING

A. Refer to Section 26 05 00.

B. Training:
   1. Provide a minimum of 2 training sessions for the OWNER’s electrical maintenance personnel:
      a. Each session shall be a minimum of 4 hours.
   2. The training shall cover at a minimum:
      a. Hazards associated with arc-flash.
      b. Causes of arc-flash.
      c. Explanation of the arc-flash labels installed on the OWNER’s electrical equipment.
      d. Proper use of personal protective equipment.
      e. Personal protective equipment requirements for maintenance work.
   3. The individual in charge of the arc-flash study or qualified representative shall conduct the training sessions.

END OF SECTION
SECTION 26 18 11

OVERCURRENT PROTECTION DEVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to overcurrent protection devices.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations, Title 24
   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

2. Federal Specification
   a. W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service

3. NEMA –National Electrical Manufacturer’s Association
   a. AB 1; Molded-Case Circuit Breakers, Molded Case Switches, and Circuit-Breaker Enclosures
   b. PB 2.2; Application Guide for Ground Fault Protective Devices for Equipment

4. UL -Underwriters Laboratories, Inc.
   a. 248; Low Voltage Fuses
   b. 468; Wire Connectors
   c. 508E; IEC Type "2" Coordination Short Circuit Tests
   d. 489; Molded-Case Circuit Breakers and Circuit Breaker Enclosures
   e. 943; Standard for Ground-Fault Circuit-Interrupters

1.03 SUBMITTALS
A. Submit manufacturer's data for materials specified within this Section in accordance to Section 26 05 00.

B. Production test of circuit breakers upon request of Engineer.

C. Submittal shall show the following information: circuit breaker numbering, circuit breaker type and short circuit rating, provisions for future circuit breakers, bussing, including neutral and ground, ratings and enclosure dimensions and trims.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. The manufacturing facility shall be registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9002 Series Standards for quality.

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle carefully to avoid damage to internal components, enclosure and finish.

B. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional cover to protect enclosure in harsh environments.

PART 2 - PRODUCTS

2.01 FUSES

A. All power distribution fuses shall be time-delay, high interrupting (200kAIC minimum) and current limiting type, unless otherwise indicated. All fuses shall be of same manufacturer and model.

   1. Motor branch circuit fuses (0 – 600A): UL Class RK5 dual element, time delay type shall be size for UL 508E “Type 2” coordination for the motor controller. Coordinate fuse selection with motor starter overload relay heaters as required.

   2. General purpose feeder fuses (0 – 600A): UL Class RK1 dual element, time delay type shall be size per Drawings.

B. Control and instrumentation fuses shall of type and rating as recommended by equipment manufacturer, suitable for fuse blocks or holders installation.

2.02 MOLDED CASE CIRCUIT BREAKERS

A. General

   1. Circuit breakers shall be constructed using glass reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

   2. Circuit breakers shall have an over center, trip free, toggle operating mechanism which will provide quick-make, quick-break contact action. The circuit breaker shall have common tripping of all poles.

   3. The circuit breaker handle shall reside in a tripped position between ON and OFF to provide local trip indication.
4. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker after installation.

5. Circuit breakers shall have an RMS interrupting capacity not less than shown on Drawings, or if not shown shall not be less than:
   a. 25kA for 480V systems
   b. 22kA for 240V (or less) systems

6. Each circuit breaker shall be equipped with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit breaker tripping mechanism for maintenance and testing purposes.

7. Circuit breakers shall be equipped with UL Listed electrical accessories as noted on Drawing. Circuit breaker handle accessories shall provide provisions for locking handle in the ON and OFF position.

8. All circuit breakers shall be UL Listed for reverse connection without restrictive line and load markings and be suitable for mounting in any position.

9. Circuit breakers shall be constructed with factory installed mechanical lugs. All circuit breakers shall be UL Listed to accept field installable/removable mechanical type lugs. Lug body shall be bolted in place; snap in design not acceptable. All lugs shall be UL Listed to accept solid (not larger than #8 AWG) and/or stranded copper and aluminum conductors. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating in the CEC.

10. All circuit breakers shall be capable of accepting bus connections.

B. Thermal-Magnetic Circuit Breakers

1. Circuit breakers shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole.

2. Thermal trip elements shall be factory preset and sealed. Circuit breakers shall be true RMS sensing and thermally responsive to protect circuit conductor(s) in a 40°C ambient temperature.

3. Circuit breaker frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker.

4. Provide equipment ground fault protection where shown on Drawing with the following features.
   a. Ground fault sensing system shall be modified zero sequence sensing type and not require any external power to trip the circuit breaker.
   b. The ground fault sensing system shall be suitable for use on grounded systems. The ground fault sensing system shall be suitable for use on three-phase, three-wire circuits where the system neutral is grounded but not carried through the system or on three-phase, four-wire systems.
   c. Ground fault pickup current setting and time delay shall be field adjustable. A switch shall be provided for setting ground fault pickup point. A means to seal the pickup and delay adjustments shall be provided.
d. The ground fault sensing system shall include a ground fault memory circuit to sum the time increments of intermittent arcing ground faults above the pickup point.

e. A means of testing the ground fault system to meet the on-site testing requirements of CEC 230.95 (C) shall be provided.

f. Local visual ground fault trip indication shall be provided.

g. The ground fault sensing system shall be provided with Zone Selective Interlocking (ZSI) communication capabilities compatible with other thermal magnetic circuit breakers equipped with ground fault sensing, electronic trip circuit breakers with integral ground fault sensing and external ground fault sensing systems as noted on Drawings.

C. Electronic Trip Circuit Breakers

1. Circuit breaker trip system shall be a microprocessor-based true RMS sensing design with sensing accuracy through the thirteenth (13th) harmonic. Sensor ampere ratings shall be as indicated on Drawings.

2. The integral trip system shall be independent of any external power source and shall contain no less than industrial grade electronic components.

3. The ampere rating of the circuit breaker shall be determined by the combination of an interchangeable rating plug, the sensor size and the long-time pickup adjustment on the circuit breaker. The sensor size, rating plug and adjustment positions shall be clearly marked on the face of the circuit breaker. Circuit breakers shall be UL Listed to carry 80% (or 100% where noted on Drawings) of their ampere rating continuously.

4. The following time/current response adjustments shall be provided. Each adjustment shall have discrete settings and shall be independent of all other adjustments.
   a. Instantaneous Pickup
   b. Long Time Pickup
   c. Long Time Delay
   d. Short Time Pickup
   e. Short Time Delay
   f. Ground Fault Pickup (when specified with ground fault protection)
   g. Ground Fault Delay (when specified with ground fault protection)

5. A means to seal the trip unit adjustments in accordance with CEC 240.6 (B) shall be provided.

6. Local visual trip indication for overload, short circuit and ground fault trip occurrences shall be provided.

7. An ammeter to individually display all phase currents flowing through the circuit breaker shall be provided. All current values shall be displayed in true RMS with 2% accuracy.

8. Long Time Pickup indication to signal when loading approaches or exceeds the adjusted ampere rating of the circuit breaker shall be provided.
9. The trip system shall include a Long Time memory circuit to sum the time increments of intermittent overcurrent conditions above the pickup point. Means shall be provided to reset Long Time memory circuit during primary injection testing.

10. An ammeter to individually display all phase currents flowing through the circuit breaker shall be provided. Indication of inherent ground fault current flowing in the system shall be provided on circuit breakers with integral ground fault protection. All current values shall be displayed in true RMS with 2% accuracy.

11. Circuit breakers shall be equipped with back-up thermal and magnetic trip system.

12. Equipment Ground Fault Protection shall be provided where noted on Drawings.
   a. Circuit breakers shall be provided with integral equipment ground fault protection for grounded systems. The circuit breaker shall be suitable for use on three-phase, three-wire circuits where the system neutral is grounded but not carried through the system or on three-phase, four-wire systems.
   b. A separate neutral current transformer shall be provided for three-phase, four-wire systems.
   c. Ground fault sensing system shall be residual sensing type.
   d. The trip system shall include a ground fault memory circuit to sum the time increments of intermittent ground faults above the pickup point.
   e. A means of testing the ground fault system to meet the on-site testing requirements of CEC 230.95 (C) shall be provided.
   f. Local visual trip indication for a ground fault trip occurrence shall be provided.
   g. The ground fault sensing system shall be provided with Zone Selective Interlocking (ZSI) communication capabilities compatible with other thermal magnetic circuit breakers equipped with ground fault sensing, electronic trip circuit breakers with integral ground fault sensing and external ground fault sensing systems as noted on Drawings.

13. Circuit breaker trip system shall be equipped with an externally accessible test port. Disassembly of the circuit breaker shall not be required for testing. Test set shall be capable of verifying the operation of all trip functions with or without tripping the circuit breaker.

PART 3 - EXECUTION

3.01 PREPARATION

   A. Notify Engineer no later than 10 working days for adjustable circuit breaker settings not shown within Drawings. Submit to Engineer the following information:
      1. Panel, switchboard name/ID
      2. Circuit breaker identifier (i.e., main circuit breaker, load served, etc.)
      3. List of necessary settings (i.e., trip settings, time delays, etc.)

3.02 INSTALLATION
A. Install equipment and their accessories in to manufacturer’s instructions, pertinent Codes, and with recognized industry practices to insure device operates properly.

B. Tighten electrical connectors and terminals in accordance to manufacturer’s requirements. Where the manufacturer does not have published torque tightening values, comply with the requirements of UL 468.

3.03 FIELD QUALITY CONTROL

A. Check tightness of circuit breaker connections using a calibrated torque wrench or torque screwdriver per manufacturer’s written specifications.

B. Contractor to obtain the services of an independent testing company who shall provide quality control and adjustments as well as tests for
   1. Check each circuit breaker above 100A on a 225A frame for long-time and short-time delay pickup and instantaneous pickup.
      a. Instantaneous pickup current shall be determined by 4 cycles or less.
      b. Perform timing test with 300% of breaker trip unit rated current.
      c. Adjust unit if required, so that the tripping characteristics are within the limits of the published time-current characteristic curves for that particular trip unit.
   2. Test and calibrate ground fault protection trip and pickup time on 225A frame breakers and larger.

C. Physically test key interlock systems to check for proper functionality.

D. Check and set where required all protective device settings in accordance with approved coordination study settings and conduct ground fault acceptance tests.

3.04 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement per manufacturer’s specifications.

B. Adjust circuit breaker trip and time delay settings to values indicated as instructed by Engineer.

   1. Check each circuit breaker above 100A, long-time and short-time delay pickup and instantaneous pickup. Instantaneous pickup current shall be determined by 4 cycles or less. Perform timing test with 300% of breaker trip unit rated current. Adjust unit if required, so that the tripping characteristics are within the limits of the published time-current characteristic curves for that particular trip unit.

   2. Main circuit breaker ground fault setting shall be per CEC 230.95 (A) or as directed by Engineer.

3.05 PROTECTION

A. When directed by Engineer provide physical means to “permanently fix” settings for rotary and DIP type switches with a thin coat of clear lacquer.

3.06 CLEANING
A. Remove marks, dirt and debris from installed equipment surfaces for “new like” appearance.

END OF SECTION
SECTION 26 22 00
LOW VOLTAGE TRANSFORMER – DRY TYPE (600VAC AND LESS)

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes
   1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to transformers.

B. Related sections
   1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
      a. 26 05 26 – Grounding and Bonding for Electrical Systems
   2. The requirements of this Section apply to all Division 26 work, as applicable.
   3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:
   1. ANSI - American National Standards Institute
      a. C57; Distribution and Power Transformers, Guide for Loading Dry-Type
   2. CCR –California Code of Regulations, Title 24
      a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   3. NECA –National Electrical Contractors Association
      a. 409; Recommended Practices for Installing and Maintaining Dry-Type Transformers
   4. NEMA –National Electrical Manufacturer’s Association
      a. ST20; Dry Type Transformers for General Applications
      b. TP1; Guide for Determining Energy Efficiency for Distribution Transformers
      c. TP2; Standard Test Method for Measuring the Energy Consumption of Distribution Transformers
      d. TP3; Standard for the Labeling of Distribution Transformer Efficiency
      e. TR1; Transformers, Regulators, and Reactors

Low Voltage Transformer-Dry Type – 600 VAC and Less
26 22 00-1
5. UL -Underwriters Laboratories, Inc.
   a. 1561; Dry-Type General Purpose and Power Transformers

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.

B. Include outline and support point dimensions of enclosures and accessories; unit weights; voltage; kVA rating; impedance rating and characteristics; loss and efficiency data at 25%, 50%, 75% and 100% rated load; sound level, tap configurations; insulation system type; and rated temperature raised

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. Installation shall conform to NECA 409-2002, Recommended Practice for Installing and Maintaining Dry-Type Transformers.

1.05 DELIVERY, STORAGE AND HANDLING

A. Store in a warm, dry location with uniform temperature. Protect unit if handled in inclement weather (i.e., rain, sleet, snow, etc.). Cover ventilating opening to keep out dust and foreign materials prior to startup.

B. Handle transformer using only lifting eyes and brackets provided for that purpose; see manufacturer’s installation instructions.

PART 2 - PRODUCTS

2.01 GENERAL PURPOSE

A. Manufacturers
   1. Square D, Cutler-Hammer or approved equal.

B. Rating Information
   1. All insulating materials are to exceed NEMA ST20 standards and be rated for 220°C UL component recognized insulation system.

   2. Capable of meeting daily overload requirements of ANSI C57.96.

   3. Transformers 15kVA and larger shall be 150°C temperature rise above 40°C ambient. Transformers 25kVA and larger shall have a minimum of 4 - 2.5% full capacity primary taps.

   4. The maximum temperature of the top of the enclosure shall not exceed 50°C rise above a 40°C ambient.

   5. Sound levels shall be warranted by the manufacturer not to exceed NEMA ST20 requirements.

C. Construction
1. Transformer coils shall be of the continuous wound construction and shall be impregnated with nonhygroscopic, thermosetting varnish.

2. All cores to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.

3. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and CEC standards.

4. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use.

5. Manufacturer shall provide the optional accessories where required and noted on the Drawings:
   a. Weathershields for all models.
   b. Wall mounting brackets for 75kVA units and smaller.
   c. Ceiling mounting brackets for 150kVA units and smaller.

2.02 ENERGY EFFICIENT, GENERAL PURPOSE

A. Manufacturers
   1. Square D, Cutler-Hammer or approved equal.

B. Rating Information
   1. Same as General Purpose above except:
      a. Transformers shall be low loss type with minimum efficiencies per NEMA TP1 when operated at 35% of full load capacity. Efficiency shall be tested in accord with NEMA TP2.

C. Construction
   1. Same as General Purpose above.

2.03 PREMIUM GRADE

A. Manufacturers
   1. Square D, Cutler-Hammer or approved equal.

2.04 B. RATING INFORMATION
1. Same as General Purpose above except:
   a. Transformers 10kVA and larger shall have the following temperature rise above 40°C ambient capable of maintaining a continuous load without exceeding a 150°C rise in a 40°C ambient:
      1) 115°C rise with 115% rated load.
      2) 80°C rise with 130% rated load.
   b. The maximum temperature of the top of the enclosure shall not exceed 35°C rise above a 40°C ambient.

B. Construction
   1. Same as General Purpose above.

2.05 NON-LINEAR

A. Manufacturers
   1. Square D, Cutler-Hammer or approved equal.

B. Rating Information
   1. Same as General Purpose above except:
      a. Neither the primary nor the secondary temperature shall exceed 220°C at any point in the coils while carrying their full rating of non-sinusoidal load. Transformers are to be UL listed and as defined as the sum of fundamental and harmonic $I_h(pu)^2h_2$ per UL 1561. Transformers evaluated by the UL K-Factor evaluation shall be listed for either 115°C or 80°C average temperature rise as noted on the Drawings. K-Factor listed transformers rated at 150°C rise shall not be acceptable.
      b. K-Factor rated transformers shall have an impedance range of 3% to 5%, and shall have a minimum reactance of 2% in order to help reduce neutral current when supplying loads with large amounts of third harmonic current.

C. Construction
   1. Same as General Purpose above except:
      a. Transformers shall be supplied with quality, full width electrostatic shields resulting in a maximum effective coupling capacitance between primary and secondary of 33 picofarads. With transformers connected under normal, loaded operating conditions, the attenuation of line noise and transients shall equal or exceed the following limits:
         1) Common Mode: 0 to 1.5kHz - 120dB; 1.5kHz to 10kHz - 90dB; 10kHz to 100kHz - 65dB; 100kHz to 1MHz - 40dB
         2) Transverse Mode: 1.5kHz to 10kHz - 52dB; 10kHz to 100kHz - 30dB; 100kHz to 1MHz - 30dB

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine transformer to provide adequate clearances for installation.
B. Check that concrete pads are level and free of irregularities for floor mounted installations.
C. Begin work only after unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Read and follow manufacturer’s bulletin included with unit prior to installation.
B. Installation shall conform to NECA 409 where not specified under this Section.
C. Transformers not specifically designed for wall mounting, shall be spaced a minimum of 6" from adjacent walls, ceiling and all other equipment.
D. Mount to resist seismic forces and brace to 0.56g. Submit calculations and mounting details for review and approval.

E. Terminations
   1. Provide all transformers with lugs for both primary and secondary conductors shown on Drawings. Connect lug to termination point with appropriate size bolt, nut and washers.
   2. Use flexible conduit indoors in dry locations or liquidtight flexible conduit in damp/wet locations for primary and secondary connections to transformer case when less than 48" in length. Connection shall be to enclosure’s side panels only unless fed directly below from ground mounted installation or as shown on Drawings.

F. Grounding
   1. Provide a dual rated four-barrel solderless grounding lug with a 5/8"-11 threaded hole. Drill transformer enclosure with 11/16" bit and attach lug to enclosure using a torque bolt and T&B Dragon Tooth transition washer with the following connections:
      a. Primary feeder ground
      b. Secondary feeder ground
      c. Grounding electrode per CEC 250.30.
      d. Main bond jumper to neutral (when present)

3.03 FIELD QUALITY CONTROL

A. Check for damage and tight connections prior to energizing transformer.
B. Measure primary and secondary voltages, and make appropriate tap adjustments to within 2% of rated voltage

3.04 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION
SECTION 26 24 13

SWITCHBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to switchboards and large distribution panels.

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
   a. 26 05 26 – Grounding and Bonding for Electrical Systems
   b. 26 24 19 – Motor Control Centers
   c. 26 18 11 – Overcurrent Protection Devices

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ANSI - American National Standards Institute
   a. C12.16; Solid State Electricity Metering
   b. C57.13; Instrument Transformers

2. CCR –California Code of Regulations, Title 24
   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

3. Federal Specification
   a. W-C-37; Circuit Breakers, Molded Case, Branch Circuit and Service

4. NECA –National Electrical Contractors Association
   a. 400, Recommended Practice for Installing and Maintaining Switchboards

5. NEMA –National Electrical Manufacturer’s Association
   a. AB 1; Molded Case Circuit Breakers and Molded Case Switches
   b. KS; Fused and Non-fused Switches
   c. PB 2; Deadfront Distribution Switchboards, File E8681
d. PB 2.1; Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less

e. PB 2.2; Application Guide for Ground Fault Protective Devices for Equipment

6. UL -Underwriters Laboratories, Inc.
   a. UL 50; Cabinets and Boxes
   b. UL 98; Enclosed and Dead Front Switches
   c. UL 489; Molded Case Circuit Breakers
   d. UL 891; Dead-Front Switchboards
   e. UL 943; Ground Fault Circuit Interrupters
   f. UL 977; Fused Power Circuit Devices

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.

B. Shop Drawings shall indicate front and side enclosure elevations with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; one-line diagrams; equipment schedule; and switchboard instrument details.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. The manufacturing facility shall be registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9002 Series Standards for quality.

C. Installation shall conform to NECA 400. Recommended Practice for Installing and Maintaining Switchboards unless otherwise specified.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products in conformance with manufacturer’s recommended practices as outlined in applicable Installation and Maintenance Manuals.

B. Each switchboard section shall be delivered in individual shipping splits for ease of handling. They shall be individually wrapped for protection and mounted on shipping skids.

C. Store in a clean, dry space. Maintain factory protection and/or provide an additional heavy canvas or heavy plastic cover to protect structure from dirt, water, construction debris, and traffic. Where applicable, provide adequate heating within enclosures to prevent condensation.

D. Handle in accordance with NEMA PB 2.1 and manufacturer’s written instructions. Lift only by lifting means provided for this express purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.
PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Square D or approved equal.
B. Shall match the manufacturer for Section 26 24 19.

2.02 MATERIAL

A. General

1. Utility Metering Compartment: The utility current transformer compartment shall be connected for hot sequence metering. The compartment shall comply with EUSERC and/or the local utility company specifications.

2. Switchboards shall be rated with a minimum short circuit current rating at listed voltage as shown on Drawings.

3. All unused spaces provided, unless otherwise specified, shall be fully bussed and equipped for future devices, including all appropriate connectors and mounting hardware.

4. Enclosure shall be of NEMA type shown on Drawings.

5. Sections shall be aligned front and rear.

6. The switchboard(s) shall be of deadfront construction.

7. The switchboard frame shall be of formed steel rigidly bolted together to support all cover plates, bussing and component devices during shipment and installation.

8. Each switchboard section shall have an open bottom and an individually removable top plate for installation and termination of conduit.

9. The switchboard enclosure shall be painted on all exterior surfaces. The paint finish shall be a medium gray, ANSI #49, applied by the electro-deposition process over an iron phosphate pre-treatment.

10. All front covers shall be screw removable with a single tool and all doors shall be hinged with removable hinge pins.

11. Top and bottom conduit areas shall be clearly indicated on shop drawings.

12. Provide 1” high by 3” wide engraved laminated nameplates for each device. Furnish black letters on a white background for all voltages.

13. Bus Composition shall be plated copper. Plating shall be applied continuously to all bus work. The switchboard bussing shall be of sufficient cross-sectional area to meet UL 891 temperature rise requirements. The phase and neutral through-bus shall have an ampacity as shown in the plans. For 4-wire systems, the neutral shall be of equivalent ampacity as the phase bus bar. Tapered bus is not acceptable. Full provisions for the addition of future sections shall be provided. Bussing shall include all necessary hardware to accommodate splicing for future additions.

14. Bus Connections shall be bolted with Grade 5 bolts and conical spring washers.
15. Ground Bus shall be sized per CEC and UL 891 Tables 25.1 and 25.2 and shall extend the entire length of the switchboard. Provisions for the addition of future sections shall be provided.

16. Square-D I-Line or equivalent distribution bussing with the following characteristics where so noted on Drawings.

a. Circuit breaker(s) shall be group mounted plug-on with mechanical restraint on a common pan or rail assembly, facilitating ease of installation of future devices.

b. The interior shall have three bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus, providing side-by-side mounting of breakers.

c. Circuit breaker(s) equipped with line terminal jaws shall not require additional external mounting hardware. Circuit breaker(s) shall be held in mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breaker(s) of different frame sizes shall be capable of being mounted across from each other.

d. Line-side circuit breaker connections are to be jaw type, whereby clamping forces are increased under faulted conditions.

e. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.

B. Incoming main devices shall of type and accessories as shown on Drawings.

1. Circuit Breakers

a. Circuit breaker shall be of type, rating and poles shown on Drawings per Section 26 18 11 – Overcurrent Protection Devices.

2. Fusible Switches

a. Single main group mounted through 800 A.

b. Fusible main switch shall be group mounted plug-on with mechanical restraint. No additional hardware shall be required to mount the fusible switch into the switchboard.

c. Switch shall have dual cover interlocks designed to prevent the opening of the cover when the switch is ON. The cover interlock shall prevent the switch from being turned ON with the cover open. Interlock may be manually overridden for testing purposes. Switch cover shall include a means by which the cover can be padlocked in the closed position. The operating handle shall feature positive lock-off means by providing provisions for (3) 0.375” padlocks.

d. Load side fusible switch connections shall be jaw type.

3. Incoming Lug Only (Distribution only, non-service entrance)

a. Incoming conductors shall terminate at lug landing pads rated per Drawings.
b. All lugs shall be UL Listed to accept solid and/or stranded copper conductors only. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating in the CEC.

c. Provide compression type lugs to accommodate the conductor shown on the associated drawings.

C. Distribution section devices shall of type and accessories as shown on Drawings.
   1. Group mounted or individually mounted as shown on Drawings.
   2. All distribution circuit breakers shall be thermal-magnetic molded case, unless otherwise noted on Drawings.
   3. Circuit breaker shall be of type, rating and poles shown on Drawings per Section 26 18 11 – Overcurrent Protection Devices.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine switchboard to provide adequate clearances for installation.
B. Check that concrete pads are level and free of irregularities.
C. Begin work only after unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install switchboard in location shown on Drawings, in accordance with manufacturer’s written instructions and NEMA PB 2.1. Anchor to resist seismic forces as indicated on Drawings and in accordance with California Building Code (CBC) anchorage requirements. Provide all testing and inspections requirements by inspecting authority.
B. Installation shall conform to NECA 400 where not specified under this Section.
C. Tighten accessible bus connection and mechanical fasteners after placing switchboard.

3.03 FIELD QUALITY CONTROL

A. Contractor shall obtain the services of an independent testing company who shall provide quality control and adjustments as well as tests.
B. Inspect complete installation for physical damage, proper alignment, anchorage and grounding prior to energizing.
C. Measure the insulation resistance of each bus section phase-to-phase and phase-to-ground for one minute each at 1000Vdc; acceptable insulation resistance is 1 megaohms. Also, refer to manufacturer’s specifications for specific testing procedures and values.
D. Check tightness of accessible bolted bus joints using a calibrated torque wrench per manufacturer’s specifications.
E. Physically test key interlock systems to check for proper functionality.
F. Test ground fault systems by push-to-test button.
G. Check and set where required all protective device settings in accordance with approved coordination study settings and conduct ground fault acceptance tests.

3.04 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement per manufacturer’s specifications.
B. Tighten bolted bus connections in accordance with manufacturer’s instructions.
C. Adjust circuit breaker trip and time delay settings to values indicated by Engineer.
D. Main circuit breaker ground fault setting shall be per CEC 230-95 (A).

3.05 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION
SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes
   1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to panelboards.

B. Related sections
   1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
      a. 26 05 26 – Grounding and Bonding for Electrical Systems
      b. 26 18 11 – Overcurrent Protection Devices
   2. The requirements of this Section apply to all Division 26 work, as applicable.
   3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:
   1. CCR – California Code of Regulations, Title 24
      a. Part 3 - California Electrical Code (CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   2. Federal Specification
      a. W-C-375; Circuit Breakers, Molded Case, Branch Circuit And Service
   3. NECA – National Electrical Contractors Association
      a. 407; Recommended Practice for Installing and Maintaining Panelboards
   4. NEMA – National Electrical Manufacturer’s Association
      a. AB 1; Molded Case Circuit Breakers
      b. PB 1; Panelboards
      c. PB 1.1; Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less
   5. UL - Underwriters Laboratories, Inc.
      a. 50; Cabinets and Boxes
      b. 67; Panelboards
c. 98; Enclosed and Dead Front Switches
d. 489; Molded-Case Circuit Breakers and Circuit Breaker Enclosures
e. 891; Dead-Front Switchboards
f. 943; Ground Fault Circuit Interrupters
g. 977; Fused Power Circuit Devices; Enclosures for Electrical Equipment

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.
B. Submittal shall show the following information: circuit breaker numbering, circuit breaker type and short circuit rating, provisions for future circuit breakers, bussing, including neutral and ground, ratings and enclosure dimensions and trims.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle carefully to avoid damage to internal components, enclosure and finish.
B. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional cover to protect enclosure in harsh environments.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Square D, Cutler-Hammer or approved equal.

2.02 MATERIALS

A. Panelboards
   1. Interior
      a. Shall be factory-assembled with voltage, ampacity, and short circuit rating as shown in Drawings.
      b. Provide 1 continuous copper bus bar per phase. Each bus bar shall have sequentially phase branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current rating shall be determined by heat-rise tests conducted in accordance with UL 67. Panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and CEC 230.F and 230.G.
      c. All current-carrying parts shall be insulated from ground and phase-to-phase by high dielectric strength material.
d. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trims shall have pre-formed twist-out covering unused mounting spaces.

e. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short circuit current rating shall be displayed on the interior.

f. Main and sub-feed circuit breakers shall be vertical mounted. Interior leveling provisions shall be provided for flush mounted applications.

2. Main Circuit Breaker

a. Circuit breaker shall be of type, rating and poles shown on Drawings per Section 26 18 11 – Overcurrent Protection Devices.

3. Branch Circuit Breakers

a. Circuit breakers shall be of type, rating and poles shown on Drawings per Section 26 18 11 – Overcurrent Protection Devices.

4. Enclosures

a. Type NEMA 1 Boxes

1) Boxes shall be galvanized steel constructed in accordance with UL 50 requirements. Galvanealed steel will not be acceptable.

2) Boxes shall have removable endwalls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.

3) Box width shall be 20 in wide.

b. Type NEMA 1 Fronts

1) Front shall meet strength and rigidity requirements per UL 50 standards. Front shall have ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.

2) Fronts shall be hinged 1-piece with door. Mounting shall be as indicated in Drawings.

3) Panelboards rated 225 amperes and below shall flat fronts with concealed door hinges and trim screws. Front shall not be removable with the door locked. Panelboards rated above 225 amperes shall have fronts with trim clamps and concealed door hinges. Front doors shall have rounded corners and edges shall be free of burrs.

4) Front shall have cylindrical tumbler type lock with catch and spring-loaded stainless steel door pull. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of door.

c. Type NEMA 3R, 5, and 12

1) Enclosures shall be constructed in accordance with UL 50 requirements. Enclosures shall be painted with ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
2) All doors shall be gasketed and equipped with a tumbler type vault lock. All lock assemblies shall be keyed alike. 2 keys shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of door.

3) Maximum enclosure dimensions shall not exceed 20 in wide and 6.5 in deep.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer’s written instructions and NEMA PB 1.1.
B. Installation shall conform to NECA 407 where not specified under this Section.
C. Anchor panelboards to structural members and as shown on Drawings. Provide additional support as required. Anchor freestanding distribution panels to concrete pad.
D. Mount panelboards level and plumb.
E. Install flush mounted panel backbox front edges flush with finished wall. Where flush panel backbox is deeper than wall depth, install closing trim of wood or metal to provide a finished trim.
F. Where panelboard is flush in wall, provide one ¾” conduit stub into accessible ceiling above for every 5 spare circuit breaker or available space.
G. After installation, make all feeder connections to circuit breaker load side lugs and incoming secondary feeders.

3.02 FIELD QUALITY CONTROL

A. Inspect complete installation prior to energizing for physical damage, proper alignment, anchorage and grounding.
B. Check tightness of bolted connections and circuit breaker connections using a calibrated torque wrench or torque screwdriver per manufacturer’s written specifications.

3.03 ADJUSTING

A. Measure steady state load line currents at each panelboard feeder; rearrange panelboard circuits to balance the phase loads with 20% of each other. Maintain proper phasing for multi-wire branch circuits.
B. Fill out panelboard circuit identification card, typewritten, with list of circuits in use. Identification shall be specific with room designation and other information as necessary. For distribution panels, use engraved laminated phenolic plates showing load served.

END OF SECTION
SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes
   1. Provide all labor, materials and equipment necessary to complete the installation
      required for the items specified under this Section, including but not limited to
      wiring devices.

B. Related sections
   1. Where items specified in other Division 26 sections conflict with the requirements
      of this Section, the most stringent requirement shall govern.
      a. 26 05 26 – Grounding and Bonding for Electrical Systems
   2. The requirements of this Section apply to all Division 26 work, as applicable.
   3. Consult all other sections, determine the extent and character of related work
      and properly coordinate work specified herein with that specified elsewhere to
      produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards
   except as otherwise shown or specified:
   1. Federal Specification
      a. W-C-506; Connector, Electrical, Power, General Specification for
      b. W-S-896; Switches, Toggle (Toggle and Lock), Flush Mounted (General
         Specification)
   2. NEMA – National Electrical Manufacturer’s Association
      a. WD 1; General Color Requirements for Wiring Devices
      b. WD 6; Wiring Devices-Dimensional Requirements
   3. UL - Underwriters Laboratories, Inc.
      a. 20; General-Use Snap Switches
      b. 498; Standard for Attachment Plugs and Receptacles
      c. 943; Standard for Ground-Fault Circuit-Interrupters
      d. 1449; Standard for Transient Voltage Surge Suppressors

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance
   to Section 26 05 00.
1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

PART 2 - PRODUCTS

2.01 SWITCHES

A. Wall switches
   2. Rating shall be 20A at 120/277Vac, unless otherwise shown.
   3. Handles shall be nylon; color shall be compatible with adjacent wall finish.
   4. Manufacturers and types
      a. Single pole, single throw
         1) Cooper Wiring Devices #CSB120, Hubbell #CSB120, or equal.
      b. Double pole, single throw
         1) Cooper Wiring Devices #CSB220, Hubbell #CSB220, or equal.
      c. Three way
         1) Cooper Wiring Devices #CSB320, Hubbell #CSB320, or equal.

2.02 RECEPTACLES

A. Standards
   1. Specification grade, NEMA 5-15R configuration grounding type, rated 15A at 125/250Vac that conform to NEMA WD-6 and Fed. Spec W-C-596.
   2. At dedicated receptacle locations and as otherwise noted, use specification grade, NEMA 5-20R configuration grounding type, rated 20A at 125/250Vac that conform to NEMA WD-6 and when possible Fed. Spec W-C-596.
   3. Specialty receptacles shall conform to NEMA WD-6 and UL standards as applicable.

B. Color
   1. General purpose receptacle face shall be nylon; color shall be compatible with adjacent wall finish, unless otherwise indicated.

C. Receptacle types
   1. General purpose single
      a. Provide self-grounding back and side wired with binding head staked terminal screw.
      b. Use Cooper Wiring Devices #5261, Hubbell #5261, or equal for NEMA 5-15R.
2. General purpose duplex
   a. Provide self-grounding back and side wired with binding head staked terminal screws and break-off strip for two circuit wiring.
   b. Use Cooper Wiring Devices #5262, Hubbell #5262, or equal for NEMA 5-15R.
   c. Use Cooper Wiring Devices #5362, Hubbell #5362, or equal for NEMA 5-20R.

3. Transient voltage surge suppressor (TVSS) duplex
   a. Provide 20A, 125Vac receptacle consisting of NEMA 5-20R duplex device with integral TVSS protection circuit.
   b. Provide LED indicator to verify surge protection and ground, and audible alarm to notify bad ground connection or surge protection expiration.
   c. TVSS characteristics:
      1) 400V clamping voltage.
      2) 280J energy rating.
      3) 150Vac RMS MOV rating
      4) 18kA maximum surge current in all modes (L-N, L-G and N-G)
   d. Use Cooper Wiring Devices #5362_S, no known equal.

4. Isolated ground
   a. Provide receptacle specified within this Section with equipment grounding contacts connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap.

5. Ground fault circuit interrupter (GFCI) duplex
   a. Provide 20A, 125Vac receptacle consisting of NEMA 5-20R duplex device with integral solid state sensing and signaling circuitry capable of detecting and interrupting a maximum 5mA line-to-ground fault current in approximately 1/40th of a second per UL 943.
   b. Provide visual device with trip indication, manual reset and test mechanisms per UL 943.
   c. Device shall be capable of point of use and multi-outlet protection.
   d. Use Cooper Wiring Devices #XGF20, Hubbell #GF53, or equal.

6. Hospital grade and tamper resistant
   a. Provide receptacle specified within this Section that conforms to UL 498 “Hospital Grade” requirements.
   b. Tamper resistance receptacle shall have integral protection mechanism to prevent accidental shock from foreign object contacting energized blades.

7. Special purpose
a. Provide specification grade devices with NEMA configuration, voltage, ampacity, poles and ground provisions as noted on Drawings.

2.03 WALL PLATES

A. Interior locations
   1. Finished Areas: 0.032” stainless steel, brushed or satin finish with required number of openings for location.
   2. Exposed Areas: galvanized, raised type.

B. Exterior: die-cast copper-free aluminum, gasketed, raintight cover UL listed for exterior and wet locations while in use. Use Hubbell #WP8M (duplex), #WP26M (GFCI) or equal.

C. Screws shall match plate.

D. Tamper resistance receptacles shall have exposed screws of tamper resistant type.

E. Individual, gangable wall plates are not acceptable where two or more devices are installed at one location.

PART 3 - EXECUTION

3.01 PREPARATION

A. Coordinate device heights with drawings and details.

B. Locate switches on latch side of door, unless otherwise indicated.

3.02 INSTALLATION

A. Mount and align device and wall plates level and plumb. Insure wall plates fit flat against wall and tight against device without strain on plate.

B. Comply with manufacturer’s instructions regarding termination of conductors to wiring device.

C. Provide wall plates for all outlet boxes with devices.

D. Install blank wall plates on all outlet boxes in which no device is present or installed.

END OF SECTION
SECTION 26 28 16

SAFETY SWITCHES AND INDIVIDUAL MOUNTED CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes
   1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to heavy duty fusible, non-fusible and double throw safety switches.

B. Related sections
   1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
      a. 26 05 26 – Grounding and Bonding for Electrical Systems
      b. 26 18 11 – Overcurrent Protection Devices
   2. The requirements of this Section apply to all Division 26 work, as applicable.
   3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:
   1. CCR – California Code of Regulations, Title 24
      a. Part 3 - California Electrical Code (CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   2. NEMA – National Electrical Manufacturer’s Association
      a. KS 1; Enclosed Switches
      b. 250; Enclosures for Electrical Equipment
   3. UL - Underwriters Laboratories, Inc.
      a. 98; Enclosed and Dead Front Switches
      b. 489; Molded-Case Circuit Breakers and Circuit Breaker Enclosures

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.

1.04 QUALITY ASSURANCE
A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle carefully to avoid damage to internal components, enclosure and finish.
B. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional cover to protect enclosure in harsh environments.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Square D, Cutler Hammer or approved equal.

2.02 MATERIALS

A. Heavy-duty safety switches
   1. Switch interior
      a. All switches shall have switch blades which are visible when the switch is OFF and the cover is open.
      b. Lugs shall be front removable and UL Listed for 75°C conductors, aluminum or copper.
      c. 30A through 100A switches shall be equipped with factory or field installed fuse pullers.
      d. Switches required for Type 12, 12K or Type 4-4X-5 stainless steel applications shall have all copper current carrying parts.
      e. All current carrying parts shall be plated to resist corrosion.
      f. Switches shall have removable arc suppressors to facilitate easy access to line side lugs.
      g. Switches shall have provisions for a field installable electrical interlock.
   2. Switch mechanism
      a. Switch operating mechanism shall be quick-make, quick-break such that, during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.
      b. The operating handle shall be an integral part of the box, not the cover.
      c. Provisions for padlocking the switch in the OFF position with at least three padlocks shall be provided.
      d. The handle position shall travel at least 90° between OFF and ON positions to clearly distinguish and indicate handle.
      e. All switches shall have a dual cover interlock mechanism to prevent unintentional opening of the switch cover when the switch is ON and prevent turning the switch ON when the cover is open. The cover interlock
mechanism shall have an externally operated override but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

3. Switch enclosures
   a. All enclosures shall be NEMA 1 general purpose unless otherwise noted.
   b. Switch covers shall be attached:
      1) with welded pin-type hinges (Type 1, 12, 12K, 4-4X-5 stainless steel).
      2) top hinged, attached with removable screws and securable in the open position (Type 3R).
      3) by molded hinges and type 316 stainless steel hinge pins (Type 4X polyester).
      4) by type 316 stainless steel bolts (Type 7/9).
   c. The enclosure shall be finished with:
      1) gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated steel (Type 1).
      2) gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated galvannealed steel (Type 3R, 12, 12K).
      3) a brush finish on type 304 stainless steel (Type 4-4X-5 stainless steel).
      4) Gray baked enamel on copper free cast aluminum alloy (Type 7/9).
   d. The enclosure shall have ON and OFF markings:
      1) stamped into the cover (Type 1, 3R, 4-4X-5 stainless steel, 12, 12K).
      2) cast into the cover (Type 7/9).
      3) inked on a adhesive label (Type 4X polyester).
   e. The operating handle shall be provided with a dual colored, red/black position indication.
   f. All switches shall have provisions to accept up to three 3/8" hasp padlocks to lock the operating handle in the OFF position.

4. Switch ratings
   a. Switches shall be horsepower rated for ac and/or dc as indicated on Drawings.
   b. The UL Listed short circuit current rating of the switches shall be:
      1) 10,000 rms symmetrical amperes when used with or protected by Class H or K fuses (30-600A).
      2) 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses (30-600A switches employing appropriate fuse rejection schemes).
      3) 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200A)
B. Double throw switches
   1. Shall have the same characteristics as heavy-duty safety switches above for
      switch interior, mechanism, enclosure and rating.
   2. Additional switch operating mechanism characteristics shall be:
      a. quick-make, quick-break for 60A through 200A, 2 pole and 3 pole devices.
      b. Slow-make, slow-break for
         1) 30A and greater than 200A, 2 pole and 3 pole devices.
         2) 60A through 200A, 4 pole devices.

C. Individual Mounted Circuit Breakers
   1. Circuit Breaker
      a. Circuit breakers shall be of type, rating and poles shown on Drawings per
         Section 26 18 11 – Overcurrent Protection Devices.
   2. Enclosure
      a. Enclosure shall be galvanized steel constructed in accordance with UL 50
         requirements, and be NEMA 1, unless specifically shown or specified
         otherwise.

PART 3 - EXECUTION

3.01 INSTALLATION
   A. The equipment shall be installed per the manufacturer's recommendations.
   B. Anchor safety switches to structural members and as shown on Drawings. Provide
      additional support as required.
   C. Mount safety switches level and plumb.

3.02 FIELD QUALITY CONTROL
   A. Inspect complete installation prior to energizing for physical damage, proper
      alignment, anchorage and grounding.
   B. Check tightness of bolted connections per manufacturer's written specifications.

END OF SECTION
SECTION 26 29 33

SOLID STATE REDUCED VOLTAGE CONTROLLER

PART 1 GENERAL

1.1 SUMMARY

A. Section includes
   1. Solid State Reduced Voltage Controller

B. Related Sections
   1. 26 05 00 – Basic Electrical Materials and Methods

1.2 QUALIFICATIONS

A. Manufacturer
   1. The manufacturer shall have a minimum of 15 years’ experience in the
      manufacturer of solid state reduced voltage controllers.
   2. The approved manufacturers are:
      a. Rockwell Automation Allen-Bradley or approved equal.

B. Support
   1. The manufacturer shall maintain factory trained and authorized service
      facilities within 100 miles of the project and shall have a demonstrated
      record of service for at least the previous ten years.
   2. Support personnel are to be direct employees of the manufacturer.
   3. The manufacturer shall provide all required start-up and training
      services.

C. Certification
   1. To insure all quality and corrective action procedures are documented
      and implemented all manufacturing locations shall be certified to the
      ISO-9001 Series of Quality Standards.
   2. Third party manufacturers and brand labeling shall not be allowed.

1.3 REFERENCES

A. The controller shall be designed to meet the applicable requirements of:
   1. EN
   2. IEC
   3. UL
   4. CSA
   5. NEMA
   6. IEEE
   7. VDE

B. These standards shall include:
   1. Creep distances and clearances 600V (UL/CSA) and 690V (IEC)
   2. Power terminal markings per EN 50005 and EN 60947
   3. Dielectric withstand per UL508 and IEC947
   4. Noise and radio frequency (RF) immunity per NEMA ICSA1-109
5. Surge withstand per IEEE587 and IEC 801-5

1.4 ENVIRONMENTAL REQUIREMENTS

A. Confirm to specified service conditions during and after installation of products
B. Maintain area free of dirt and dust during and after installation of products

1.5 PRE-MANUFACTURE SUBMITTALS

A. Refer to Section 26 05 00 for submittal procedures
B. Shop Drawings
   1. Elevation drawings showing dimensional information
   2. Structure Descriptions showing
      a. Enclosure ratings
      b. Fault ratings
      c. Other information as required for approval
   3. Conduit locations
   4. Unit Descriptions including amperage ratings, frame sizes, trip settings, pilot devices, etc.
   5. Nameplate Information
   6. Schematic wiring diagrams
C. Product Data
   1. Publications on solid state reduced voltage controller.
   2. Data Sheets and Publications on all major components
      a. Contactors
      b. Circuit Breaker and Fuse information including time current characteristics
      c. Control Power Transformers
      d. Pilot devices
      e. Relays
D. Specification Response
   1. Detailed response to this specification showing where in the literature each requirement is satisfied.
   2. All clarifications and exceptions must be clearly identified.
E. Testing and Test Reports
   1. Testing shall be per manufacturer’s standard
   2. A copy of the test reports shall be provided as part of the Closeout documentation

1.6 CLOSEOUT SUBMITTALS

A. Contractor shall provide certification that the solid state reduced voltage controller has been installed in accordance with the manufacturer’s instructions.
B. The Contractor shall provide certification that the Contractor has properly adjusted any timing devices required in the starting circuitry.
C. Final Drawings. The manufacturer shall provide final drawings reflecting the
“As- Shipped” status of the installed equipment. The contractor shall be responsible for making any changes to the “As-Shipped” drawings from the manufacturer to reflect any field modifications.

D. Maintenance Data
1. Solid state reduced voltage controller installation instructions and User Manual
2. Installation / Operation instructions for major components such as circuit breakers, contactors, etc.
3. Parameter Listing
4. Field Service report from start-up service
5. Solid state reduced voltage controller spare parts listing and pricing
6. Include name and phone number for a local distributor for the spare parts.

1.7 DELIVERY, STORAGE AND HANDLING
A. Contractor shall coordinate the shipping of equipment with the manufacturer.
B. Contractor shall store the equipment in a clean and dry space.
C. The contractor shall protect the units from dirt, water, construction debris and traffic.
D. During storage the contractor shall connect internal space heaters (if specified) with temporary power.

1.8 FIELD MEASUREMENTS
A. The Contractor shall verify all field measurements prior to the fabrication of the solid state reduced voltage controller.

1.9 SPARE MATERIALS
A. Provide one (1) set of (3) of each size power fuse utilized
B. Provide spares equal to 10 percent of the installed quantity for primary and secondary control power fuses
C. Provide one (1) spare control relay for each unique relay utilized on the project
D. Contractor to provide identification of the above items for each unit in accordance to the identification given on the starter.

1.10 WARRANTY
A. The manufacturer shall provide a parts warranty for eighteen (18) months from the date of shipment or twelve (12) months from the date of being energized, whichever occurs first.
B. The manufacturer shall confirm this warranty as part of the submittal.
C. This warranty applies only to stand alone solid state reduced voltage controllers.

PART 2 PRODUCTS

2.1 GENERAL DESCRIPTION

A. The soft starter shall utilize an SCR bridge consisting of at least two SCRs per phase to control the starting and stopping of industry standard motors.

B. The soft start shall provide torque control for linear acceleration independent of motor load or application type without external feedback. The gating of the SCRs will be controlled in such a manner to ensure stable and linear acceleration ramp.

C. The soft starter shall be controlled by a microprocessor that continuously monitors the current and controls the phasing of the SCRs. Analog control algorithms shall not be allowed.

D. All soft starter power ratings will utilize the same control board/module.

2.2 RATINGS

A. The soft start shall be designed to operate in an ambient temperature 0°C to 40°C (14°F to 104°F). For ambient temperatures between 40°C and 60°C (104°F and 140°F), derate the current by 2% per °C above 40°C (104°F).

B. Storage temperature range shall be -25°C to 70°C (-13°F to 158°F).

C. Maximum relative humidity shall be 95%, non-condensing or dripping water, conforming to IEC 60947-4-2.

D. The soft starter shall be designed to operate in altitudes up to 1000m (3300 ft). For higher altitudes, derate by 2.2% for each additional 100 m (330 ft) with a maximum of 2000m (6600 ft).

E. The soft starter shall be capable of operation between + / - 10% of nominal voltage rating.

F. The soft start shall automatically adapt for operation at 50 or 60 Hz, with a frequency tolerance of +/- 5%. By configuration, it will have to be capable of operation at a supply line frequency that can vary by +/- 20% during steady state operation.

G. The soft start shall be capable of supplying 400% of rated full load current for 23 seconds at maximum ambient temperature. The soft starter shall also be capable of 10 evenly spaced starts per hour at 400% of full rated current for 12 seconds per start.

H. The SCRs shall have a minimum P.I.V. rating of 1800 Vac. Lower rated SCRs with MOV protection are not acceptable.
I. A seismic qualification label shall be provided for all floor mount configuration units to comply with the latest IBC 2000 and NFPA 5000 guidelines.

2.3 ADJUSTMENTS AND CONFIGURATIONS

A. All programming/configuration devices, display units, and field control wiring terminals shall be accessible on the front of the control module. Exposure to control circuit boards or electrical power devices during routine adjustments is prohibited.

B. Digital indication shall provide, as a minimum, the following conditions:


2. Motor status - current, torque, thermal state, power factor, operating time, power in kW.

3. Fault status - Motor thermal overload, soft starter thermal fault, loss of line or motor phase, line frequency fault, low line voltage fault, locked rotor fault, motor underload, maximum start time exceeded, external fault, serial communication fault, line phase reversal fault, motor overcurrent fault.

C. The soft starter must be preset to the following for adjustment-free operation in most applications:

1. Linear (torque-controlled) acceleration ramp of 15 seconds.

2. Current limitation to 400% of the motor full load current rating.

3. Class 10 overload protection.

4. Motor current preset per NEC / NFPA 70 table 430.150 for standard hp motors.

D. A digital keypad shall be utilized configure the following operating parameters as required:

1. Motor full load amps adjustable from 40 to 130% of the soft starter's rating.

2. Current limitation on starting adjustable from 150 to 700% of the motor current rating, not to exceed 500% of the soft starter rating.

3. Linear (torque-controlled) acceleration ramp adjustable from 1 to 60 seconds.

4. Initial torque adjustable from 10 to 100% of nominal motor torque.

5. Torque limit adjustable from 10 to 200% of nominal motor torque.

6. Maximum start time adjustable from 10 to 999 seconds.

7. Voltage boost adjustable from 50 to 100% of the nominal supply voltage.
8. Selection of freewheel, soft stop or braking.

9. Linear (torque-controlled) deceleration ramp time adjustable from 1 to 60 seconds.

10. Threshold to change to freewheel from a controlled deceleration ramp to freewheel stop: adjustable from 0 to 100% of the nominal motor torque.

11. Braking torque level adjustable from 0 to 100% effectiveness.

12. Selection of Class 2, 10, 10A, 15, 20, 25 or 30 motor thermal overload protection.

E. A digital keypad shall be utilized configure the following controller parameters as required:
   1. Selectable automatic reset operation.
   2. Cancellation of the torque control loop for multi-motor installations.
   3. Adjustment of the stator loss estimation for specialty motors.
   4. Assignment of soft starter inputs and output control terminals.
   5. Activation of line phase reversal protection.
   6. Reset of motor thermal state.
   7. Return to factory settings.
   8. Activation of test mode for use with low power motors.
   9. Indication of elapsed time in hours of starting, running and stopping.

F. Output relays shall provide the following status indications:
   1. One Form A (N.O.) minimum for indication of fault.
   2. One Form A (N.O.) for indication that acceleration ramp is complete and current is below 130% motor FLA (end of start).
   3. One Form A (N.O.) assignable to one of the following functions: motor thermal alarm, motor current level alarm, and motor underload alarm.

G. Additional inputs and outputs shall be available to provide the following status indications:
   1. Two assignable control inputs for the following functions: force to freewheel stop, external fault input, disable serial link control, external motor overload reset or general fault reset.
   2. Two assignable logic-level signal outputs for the following functions: motor thermal overload alarm, “motor powered” signal, motor overcurrent alarm, or motor underload alarm.
3. One analog output shall be available for 4 to 20 or 4 to 20 milliamp indication of motor current, motor torque, motor power, motor thermal state, or power factor.

H. Relay and I/O functions listed above must be isolated with respect to common.

2.4 PROTECTION

A. A microprocessor-based thermal protection system shall be included which continuously calculates the temperature-rise of the motor and soft starter and provides:

1. A motor overload pre-alarm that indicates by relay contact or logic output that the motor windings have exceeded 130% of its rated temperature rise. This function shall be for alarm only.

2. A motor overload fault will stop the motor if the windings have exceeded 140% of temperature-rise.

3. An electronic circuit with a time-constant adjustable to the motor's thermal cooling time-constant ensuring the memorization of the thermal state even if power is removed from the soft starter.

B. The soft starter shall provide line and motor phase loss, phase reversal, underload, stall, and jam protection.

C. The integral protective features shall be active even when the shorting contactor is used to bypass the SCRs during steady state operation.

2.5 COMMUNICATIONS

A. The soft starter will have to include a multidrop serial link for its direct connection to Modbus.

B. The soft starter shall be able to be connected to Ethernet and other networks, with connection to communication bus as an option.

C. The communication shall be able to provide access to the control, to the adjustment and to the supervision of the soft starter.

PART 3 EXECUTION

3.1 MANUFACTURER’S FIELD SERVICES

A. The service division of the manufacturer shall perform all start-up services. The use of third party supplier start-up personnel is not allowed.

B. Start-up personnel shall be direct employees of the manufacturer and shall be degreed engineers.

C. Provide a minimum of (2) hours of on-site start-up service for each controller (4 hours minimum).
D. At a minimum, the start-up service shall include:
   1. Pre-Power Check
      a. Megger Motor Resistances: Phase to Phase and Phase to Ground
      b. Verify system grounding per manufacturer’s specifications
      c. Verify power and signal grounds
      d. Check connections
      e. Check environment
   2. Power-up and Commissioning
      a. Measure Incoming Power Phase-to-Phase and Phase-to-Ground
      b. Measure DC Bus Voltage
      c. Measure AC Current Unloaded and Loaded
      d. Measure Output Voltage Phase-to-Phase and Phase-to-Ground
   3. Record all measurements
   4. Tune for system operation
   5. Provide Parameter Listing

3.2 TRAINING
A. Manufacturer to provide a quantity of (1) two hour session of on-site instruction.
B. The service engineer shall perform training.
C. The instruction shall include the operational and maintenance requirements of the controller.
D. The basis of the training shall be the installed controller, the engineered drawings and the user manual. At a minimum, the training shall:
   1. Review of the engineered drawings identifying the components shown on the drawings.
   2. Review starting / stopping options for the controller.
   3. Review operation of the Human Interface for programming and monitoring of the controller.
   4. Review the maintenance requirements of the controller.
   5. Review safety concerns with operating the controller.

END OF SECTION
PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the following items from a single supplier:
   1. Engine Generator Set.
   2. Enclosure
   3. Related Accessories as specified:
      a. (5) 50 foot cables Type "W" #4/o copper with J-Series Cam-Lok 315A connectors for (NEUTRAL, Phase A, Phase B, Phase C, GROUND)
      b. (1) 50 foot cord for 120V battery charging circuit
      c. (1) 50 foot 4 conductor #18AWG SJO cord
   
B. Products Furnished or Supplied but not installed

C. Products Installed but not furnished or supplied

D. Related Requirements
   1. It is the intent of this specification to secure an engine-driven generator set that
      has been prototype tested, factory built, production-tested, and site-tested together
      with all accessories necessary for a complete installation as shown on the plans
      and drawings and specified herein.
   2. Any exceptions to the published specifications shall be subject to the approval of
      the engineer and submitted minimum 10 days prior to the closing of the bid with a
      line by line summary description of all the items of compliance, any items that have
      been are omitted or have been taken exception to, and a complete description of
      all deviations.
   3. It is the intent of this specification to secure a generator set system that has been
      tested during design verification, in production, and at the final job site. The
      generator set will be a commercial design and will be complete with all of the
      necessary accessories for complete installation as shown on the plans, drawings,
      and specifications herein. The equipment supplied shall meet the requirements of
      the National Electrical Code and applicable local codes and regulations.
   4. All equipment shall be new and of current production by an international, power
      system manufacturer of generators, transfer switches, and paralleling switchgear.
      The manufacturer shall be a supplier of a complete and coordinated system.
      There will be single-source responsibility for warranty, parts, and service through
      a factory-authorized representative with factory-trained technicians.

1.02 PRICE AND PAYMENT PROCEDURES

A. Allowances
B. Unit Prices
C. Alternates or Alternatives
D. Measurement and Payment
1.03 REFERENCES

A. Abbreviations and Acronyms
B. Definitions
C. Reference Standards

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination
B. Pre-installation Meeting
C. Sequencing
D. Scheduling

1.05 SUBMITTALS

A. Action Submittals
   1. Product Data
      a. The submittal shall include prototype test certification and specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer switch, and the remote annunciator panel if it is included elsewhere in these specifications.
   2. Shop Drawings
   3. Samples

B. Informational Submittal
   1. Certificates
   2. Test and Evaluation Reports
   3. Manufacturer’s Instruction
   4. Source Quality Control Submittals
   5. Field or Site Quality Control
   6. Manufacturer’s Report
   7. Special Procedure Submittal
   8. Qualification Statement

C. Closeout Submittal
   1. Maintenance Contracts
   2. Operation and Maintenance Data
   3. Bonds
   4. Warranty Documentation
   5. Record Documentation
   6. Software

D. Maintenance Material Submittals

1.06 QUALITY ASSURANCE
A. Regulatory Agency
   1. The generator set shall conform to the requirements of the following codes and standards:
      b. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
      c. IEC8528 part 4, Control Systems for Generator Sets.
      d. IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.
      e. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
      f. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
      g. NFPA 99, Essential Electrical Systems for Health Care Facilities.
      h. NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.
   2. Qualifications
      a. The equipment shall be produced by a manufacturer who is ISO 9001 certified for the design, development, production and service of its complete product line.
      b. The power system shall be produced by a manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains a service organization available twenty-four hours a day throughout the year.
   3. Manufacturers
      a. The power system shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.

4. Suppliers
5. Fabricators
6. Installers/Applicators/Erectors
7. Testing Agencies
8. Licensed Professional
9. Certificates
10. Preconstruction testing
11. Field and Site Samples
12. Mock-ups

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements
B. Storage and Handling Requirements
C. Packaging Waste Management
1.08 FIELD OR SITE CONDITIONS

A. Ambient Conditions
   1. Engine-generator set shall operate in the following conditions without any damage to the unit or its loads.
      a. Ambient Temperature: 77 °F
      b. Altitude: 500 ft
      c. Relative Humidity: 95%

B. Existing Conditions

1.09 WARRANTY OR BOND

A. Manufacturer’s Warranty
   3 year 3000-hour limited warranty covers all generator set systems and components. The trailer has a one-year limited warranty.
B. Special Warranty
C. Extended Correction Period

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Kohler, Cummins, Caterpillar, or approved equal.
B. Basis of design is per 2.02.A below

2.02 EQUIPMENT

A. Equipment
   1. The generator set shall be a Kohler model 175REOZT4 with a 4S12X alternator. It shall provide 192.50 kVA and 154.00 kW when operating at 277/480 volts, 60 Hz, 0.80 power factor. The generator set shall be capable of a 130°C Standby rating while operating in an ambient condition of less than or equal to 77 °F and a maximum elevation of 500 ft above sea level. The standby rating shall be available for the duration of the outage. The generator set engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 4 Final non road emissions regulations.
B. Voltage Selector Switch – 3pole lockable
C. Cooling System 45C
D. 6 amp battery charger installed
E. Standard Air Cleaner Heavy-duty air cleaner with air restrictor indicator.
F. Shore power connection points to front of junction box for block heater, battery chargers, and battery heater.
G. Durable steel, sound-attenuating housing with quiet operation of 71 dB(A) log average @ 7 m (23 ft.) with full load at the prime rating.
H. Fuel oil storage 110% secondary containment tank for fuel. Subbase fuel tank for 24-hour run time with full load at prime rating (minimum).
I. Decision-Maker 3500 controller with potted circuitry for protection from vibration and debris. Remote start/stop capabilities. Paralleling capability with bus sensing, first-on logic, synchronizer, and (isochronous, droop, and external controlled) load sharing. Digital display with adjustable contrast and menu control provide easy local
data access. Measurements are selectable in metric or English units. Remote communication thru a PC via network or serial configuration. Controller supports Modbus protocol. Integrated hybrid voltage regulator with ±0.5% regulation. Potted circuitry for protection from vibration and debris. Built-in alternator thermal overload protection. NFPA 110 Level1 capability

J. Generator Overcurrent and Fault Protection
K. Duel Axle trailer with electric brakes
L. Alternator
1. The alternator shall be salient-pole, brushless, 2/3-pitch, with 4 bus bar provision for external connections, self-ventilated, with drip-proof construction and amortisseur rotor windings, and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a vacuum pressure impregnated, fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to 130°C Standby. The PMG based excitation system shall be of brushless construction controlled by a digital, three phase sensing, solid-state, voltage regulator. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full rated load. The TIF factor shall not exceed 50.
2. The alternator shall have a maintenance-free bearing, designed for 40000 hour B10 life. The alternator shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.
3. The generator shall be inherently capable of sustaining at least 300% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current-support devices.
4. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 406.00 LRKVA for starting motor loads with a maximum instantaneous voltage dip of 35%, as measured by a digital RMS transient recorder in accordance with IEEE Standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip, i.e., engine, alternator, voltage regulator, and governor will not be acceptable. As such, the generator set shall be prototype tested to optimize and determine performance as a generator set system.

2.03 DESCRIPTION
A. Regulatory Requirements
B. Sustainability Characteristics

2.04 PERFORMANCE / DESIGN CRITERIA
A. Capacities

2.05 ACCESSORIES
- Camlock style load connectors, color coded
- Cold weather package (includes block heater and battery heater pad and wrap)
- Duplex receptacles, two 120 V, 15 amp
- Twistlock receptacles, three 240 V, 50 amp
- Two-way fuel valve (for connection of a user-supplied external fuel tank)
- Voltage selector switch, 3-position lockable
- Trailer
- Lunette Eye (for pintle hitch tow vehicles)
- Spare Tire
- Wheel Chock Blocks

2.06 SOURCE QUALITY CONTROL

A. Non-Conforming Work

1. To ensure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for three separate tests: design prototype tests, final production tests, and site tests.

   a. Design Prototype Tests. Components of the emergency system, such as the engine/generator set, transfer switch, and accessories, shall not be subjected to prototype tests because the tests are potentially damaging. Rather, similar design prototypes and preproduction models shall be subject to the following tests:
      i. Maximum power (kW)
      ii. Maximum motor starting (kVA) at 35% instantaneous voltage dip.
      iii. Alternator temperature rise by embedded thermocouple and/or by resistance method per NEMA MG1-32.6.
      iv. Governor speed regulation under steady-state and transient conditions.
      v. Voltage regulation and generator transient response.
      vi. Harmonic analysis, voltage waveform deviation, and telephone influence factor.
      vii. Three-phase short circuit tests.
      viii. Alternator cooling air flow.
      ix. Torsional analysis to verify that the generator set is free of harmful torsional stresses.
      x. Endurance testing.

   b. Final Production Tests. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
      i. Single-step load pickup
      ii. Safety shutdown device testing
      iii. Rated Power @ 0.8 PF
      iv. Maximum power
      v. Upon request, a witness test, or a certified test record sent prior to shipment.

   c. Site Tests. The manufacturer's distribution representative shall perform an installation check, startup, and building load test. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
      i. Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
      ii. Accessories that normally function while the set is standing by
shall be checked prior to cranking the engine. These shall include: block heaters, battery chargers, alternator strip heaters, remote annunciators, etc.

iii. Generator set startup under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during operation, normal and emergency line-to-line voltage and frequency, and phase rotation.

iv. Automatic start by means of a simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator set voltage, amperes, and frequency shall be monitored throughout the test.

B. Non-Conforming Work
C. Manufacturer’s Services
D. Coordination of Other Tests and Inspections

PART 3 - EXECUTION

3.01 INSTALLERS
   A. Installer List
   B. Substitution Limitations

3.02 EXAMINATION
   A. Verification of Conditions
   B. Pre-installation Testing
   C. Evaluation and Assessment

3.03 PREPARATION
   A. Protection of In-place Condition
   B. Surface Preparation
   C. Demolition/ Removal

3.04 INSTALLATION
   A. Special Techniques
   B. Interface with Other Work
   C. System Integration
   D. Tolerances

3.05 REPAIR/ RESTORATION
3.06 REINSTALLATION

3.07 FIELD OR SITE QUALITY CONTROL
   A. Field or Site Tests and Inspection
   B. Non-Conforming Work
   C. Manufacturer’s Services
3.08 SYSTEM STARTUP

3.09 ADJUSTING

3.10 CLEANING
   A. Waste Management

3.11 CLOSEOUT ACTIVITIES
   A. Demonstration
   B. Training

3.12 PROTECTION

3.13 MAINTENANCE

3.14 ATTACHMENTS

END OF SECTION
SECTION 26 36 00

AUTOMATIC TRANSFER & BYPASS-ISOLATION SWITCH

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to automatic transfer switches (ATS) or automatic transfer switch with by-pass switch (ATS/BPS).

B. Related sections

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.
   a. 26 05 26 – Grounding and Bonding for Electrical Systems

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. CCR –California Code of Regulations, Title 24
   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments

2. NEMA –National Electrical Manufacturer’s Association
   a. ICS10-1993 (formerly ICS2-447) -AC Automatic Transfer Switches

3. NFPA –Nation Fire Protection Association
   a. NFPA 99 -Essential Electrical Systems for Health Care Facilities
   b. NFPA 110 -Emergency and Standby Power Systems

4. UL -Underwriters Laboratories, Inc.
   a. UL 508 Industrial Control Equipment
   b. UL 1008 -Standard for Transfer Switch Equipment

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.
B. Shop Drawings shall indicate front and side enclosure elevations with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; one-line diagrams; equipment schedule; and instrument details.

1.04 QUALITY ASSURANCE

A. The complete assembly shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.

B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.

C. The manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation, and servicing in accordance with ISO 9001.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products in conformance with manufacturer's recommended practices as outlined in applicable Installation and Maintenance Manuals.

B. Store in a clean, dry space. Maintain factory protection and/or provide an additional heavy canvas or heavy plastic cover to protect structure from dirt, water, construction debris, and traffic. Where applicable, provide adequate heating within enclosures to prevent condensation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Emerson Power/ASCO Series 7000 or approved equal.

2.02 EQUIPMENT

A. Mechanically Held Transfer Switch

1. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.

2. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.

3. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.
4. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.

5. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 600 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.

6. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfers between two active power sources are not acceptable.

7. Where neutral conductors must be switched as shown on the plans, the AS shall be provided with fully rated overlapping neutral transfer contacts. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which the transfer is being made. The overlapping neutral contacts shall not overlap for a period greater than 100 milliseconds. Neutral switching contacts that do not overlap are not acceptable.

8. Where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

B. Bypass-Isolation Switch (only as noted on Drawings)

1. A two-way bypass-isolation switch shall provide manual bypass of the load to either source and permit isolation of the automatic transfer switch from all source and load power conductors. All main contacts shall be manually driven.

2. Power interconnections shall be silver-plated copper bus bar. The only field installed power connections shall be at the service and load terminals of the bypass-isolation switch. All control interwiring shall be provided with disconnect plugs.

3. Separate bypass and isolation handles shall be utilized to provide clear distinction between the functions. Handles shall be permanently affixed and operable without opening the enclosure door. Designs requiring insertion of loose operating handles or opening of the enclosure door to operate are not acceptable.

4. Bypass to the load-carrying source shall be accomplished with no interruption of power to the load (make before break contacts). Designs that disconnect the load when bypassing are not acceptable. The bypass handle shall have three operating modes: "Bypass to Normal," "Automatic," and "Bypass to Emergency." The operating speed of the bypass contacts shall be the same as the associated transfer switch and shall be independent of the speed at which the manual handle is operated. In the "Automatic" mode, the bypass contacts shall be out of the power circuit so that they will not be subjected to fault currents to which the system may be subjected.

5. The isolation handle shall provide three operating modes: "Closed," "Test," and "Open." The "Test" mode shall permit testing of the entire emergency power system, including the automatic transfer switches with no interruption of power to
the load. The "Open" mode shall completely isolate the automatic transfer switch from all source and load power conductors. When in the "Open" mode, it shall be possible to completely withdraw the automatic transfer switch for inspection or maintenance to conform to code requirements without removal of power conductors or the use of any tools.

6. When the isolation switch is in the "Test" or "Open" mode, the bypass switch shall function as a manual transfer switch.

7. Designs requiring operation of key interlocks for bypass isolation or ATS’s that cannot be completely withdrawn when isolated are not acceptable.

C. Microprocessor Controller

1. The controller’s sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.

2. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to ±1% of nominal voltage. Frequency sensing shall be accurate to ±0.2%. The panel shall be capable of operating over a temperature range of -20 to +60°C and storage from -55 to +85°C.

3. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.

4. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.

5. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
   a. IEEE472 (ANSI C37.90A) Ring Wave Test.
   b. ENC55011 1991 Class A Conducted and Radiated Emission.
   c. EN61000-4-2 Electrostatic Discharge Immunity, Direct Contact & Air Discharge.
   d. EN61000-4-3 Radiated Electromagnetic Field Immunity.
   e. EN61000-4-4 Electrical Fast Transient Immunity.
   f. EN61000-4-5 Surge Immunity.
   g. ENV50141 HF Conducted Disturbances Immunity.

D. Enclosure

1. The ATS/BPS shall be furnished in a NEMA type 1 enclosure unless otherwise shown on the plans.
2. All standard and optional door-mounted switches and pilot lights shall be 16mm industrial grade type or equivalent for easy viewing & replacement. Door controls shall be provided on a separate removable plate, which can be supplied loose for open type units.

2.03 OPERATION

A. Controller Display and Keypad

1. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:

   a. Nominal line voltage and frequency
   b. Single or three phase sensing
   c. Operating parameter protection
   d. Transfer operating mode configuration: (Open transition, Closed transition or Delayed transition)

2. All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

B. Voltage, Frequency and Phase Rotation Sensing

1. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout and trip setting capabilities (values shown as % of nominal unless otherwise specified):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sources</th>
<th>(Dropout/Trip)</th>
<th>(Pickup/ Reset)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undervoltage</td>
<td>N&amp;E,3φ</td>
<td>70 to 98%</td>
<td>85 to 100%</td>
</tr>
<tr>
<td>Overvoltage</td>
<td>N&amp;E,3φ</td>
<td>102 to 115%</td>
<td>2% below trip</td>
</tr>
<tr>
<td>Underfrequency</td>
<td>N&amp;E</td>
<td>85 to 98%</td>
<td>90 to 100%</td>
</tr>
<tr>
<td>Overfrequency</td>
<td>N&amp;E</td>
<td>102 to 110%</td>
<td>2% below trip</td>
</tr>
<tr>
<td>Unbalance</td>
<td>N&amp;E</td>
<td>5 to 20%</td>
<td>1% below dropout</td>
</tr>
</tbody>
</table>

2. Repetitive accuracy of all settings shall be within ± 0.5% over an operating temperature range of -20°C to 60°C.

3. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.

4. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).

5. Source status screens shall be provided for both normal & emergency to pro-vide digital readout of voltage on all 3 phases, frequency, and phase rotation.
County of Tulare  
Water System Improvements for Yettem & Seville

C. Time Delays

1. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply.

2. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.

3. Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.

4. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.

5. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:
   a. Prior to transfer only.
   b. Prior to and after transfer.
   c. Normal to emergency only.
   d. Emergency to normal only.
   e. Normal to emergency and emergency to normal.
   f. All transfer conditions or only when both sources are available.

6. The controller shall also include the following built-in time delays for optional Closed Transition and Delayed Transition operation:
   a. 1 to 5 minute time delay on failure to synchronize normal and emergency sources prior to closed transition transfer.
   b. 0.1 to 9.99 seconds time delay on an extended parallel condition of both power sources during closed transition operation.
   c. 0 to 5 minute time delay for the load disconnect position for delayed transition operation.

7. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.

8. All time delays shall be adjustable by using the LCD display and keypad or with a remote device connected to the serial communications port.

D. Additional Features

1. A three position momentary-type test switch shall be provided for the test / automatic / reset modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal.
2. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.

3. LED indicating lights (16mm industrial grade, type 12) shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).

4. LED indicating lights (16mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.

5. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.

6. Terminals shall be provided for a remote contact that opens to signal the ATS to transfer to emergency and for remote contacts that open to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or serial port.

7. An inphase monitor shall be provided in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the ATS manufacturer. The inphase monitor shall be equal to ASCO Feature 27.

8. The controller shall be capable of accepting a normally open contact that will allow the transfer switch to function in a non-automatic mode using an external control device.

9. System Status -The controller LCD display shall include a “System Status” screen which shall be readily accessible from any point in the menu by depressing the “ESC” key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. Controllers that require multiple screens to determine system status or display “coded” system status messages, which must be explained by references in the operator's manual, are not permissible.

10. Self-Diagnostics -The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status-input signals to the controller that may be preventing load transfer commands from being completed.

11. Communications Interface –The controller shall be capable of interfacing, through an optional serial communication module, with a network of transfer switches, locally (up to 4000 ft.) or remotely through modem serial communications. Standard software specific for transfer switch applications shall be available by the transfer switch manufacturer. This software shall allow for the monitoring, control and setup of parameters.

12. Data Logging –The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory:

   a. Event Logging
1) Data and time and reason for transfer normal to emergency.
2) Data and time and reason for transfer emergency to normal.
3) Data and time and reason for engine start.
4) Data and time engine stopped.
5) Data and time emergency source available.
6) Data and time emergency source not available.

b. Statistical Data
   1) Total number of transfers.
   2) Total number of transfers due to source failure.
   3) Total number of days controller is energized.
   4) Total number of hours both normal and emergency sources is available.

13. Communications Module - A full duplex RS485 interface shall be installed in the ATS controller to enable serial communications. The serial communications shall be capable of a direct connect or multi-drop configured network. This module shall allow for the seamless integration of existing or new communication transfer devices. The serial communication interface shall be equal to ASCO Accessory 72.

2.04 WITHSTAND AND CLOSING RATINGS
A. The ATS/BPS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS/BPS terminals with the type of overcurrent protection shown on the plans.
B. The ATS/BPS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard’s 1½ and 3 cycle, long-time ratings. ATS/BPS’s which are not tested and labeled with 1½ and 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable.

PART 3 - EXECUTION

3.01 EXAMINATION
A. Examine ATS to provide adequate clearances for installation.
B. Check that concrete pads (floor mounted models) and walls (wall mounted models) are level and free of irregularities.
C. Begin work only after unsatisfactory conditions are corrected.

3.02 INSTALLATION
A. Install switchboard in location shown on Drawings, in accordance with manufacturer’s written instructions. Anchor to resist seismic forces as indicated on Drawings and in accordance with California Building Code anchorage requirements. Provide all testing and inspections requirements by inspecting authority.
B. Tighten accessible bus connection and mechanical fasteners after placing switchboard.
3.03 **FIELD QUALITY CONTROL**

A. Inspect complete installation for physical damage, proper alignment, anchorage and grounding prior to energizing.

B. Manufacturers’ field services

1. The ATS/BPS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.

2. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

3.04 **CLEANING**

A. Touch up scratched or marred surfaces to match original finish

**END OF SECTION**
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SECTION 26 50 00

LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes

1. Provide all labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to fixtures, lamps, standards, bases, hangers, supports, reflectors, glassware, lenses, auxiliary equipment, ballasts and sockets.

B. Related work under this section

1. Where items specified in other Division 26 sections conflict with the requirements of this Section, the most stringent requirement shall govern.

2. The requirements of this Section apply to all Division 26 work, as applicable.

3. Consult all other sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable specifications and standards except as otherwise shown or specified:

1. ANSI -American National Standards Institute
   a. C78; American National Standard for Electric Lamps
   b. C81; American National Standard for Electric Lampholders
   c. C82; American National Standard for Lamp Ballasts
   d. C136; American National Standard for Roadway and Area Lighting Equipment

2. California Codes of Regulations
   a. Part 3 -California Electrical Code(CEC); NFPA 70 National Electrical Code (NEC) with California amendments
   b. Part 6 -California Energy Code

3. IESNA –Illuminating Engineering Society of North America
   a. RP-16; Nomenclature and Definitions for Illuminating Engineering

4. NECA –National Electrical Contractors Association
   a. NECA/IESNA 500, Recommended Practice for Installing Indoor Commercial Lighting Systems
   b. NECA/IESNA 501, Recommended Practice for Installing Exterior Lighting Systems
c. NECA/IESNA 502, Recommended Practice for Installing Industrial Lighting Systems

5. UL -Underwriter's Laboratories, Inc.
   a. 935; Standard for Fluorescent-Lamp Ballasts
   b. 1029; Standard for High-Intensity-Discharge Lamp Ballasts
   c. 1574; Standard for Track Lighting Systems

1.03 SUBMITTALS

A. Submit manufacturer’s data for materials specified within this Section in accordance to Section 26 05 00.

B. Substituted fixtures shall be submitted with manufacturer’s specification sheet and published photometric reports, verified by testing to IES and NEMA standards under controlled laboratory conditions.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the materials specified herein shall be new and unused, bearing UL labels where applicable.

B. Installation shall conform to the following standards:
   1. NECA/IESNA 500, Recommended Practice for Installing Indoor Commercial Lighting Systems
   2. NECA/IESNA 501, Recommended Practice for Installing Exterior Lighting Systems
   3. NECA/IESNA 502, Recommended Practice for Installing Industrial Lighting Systems

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle carefully to avoid damage to internal components, enclosure and finish.

B. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional cover to protect enclosure in harsh environments.

1.06 WARRANTY

A. Furnish one-year guarantee in accordance with and in form required under Section 26 05 00.

PART 2 - PRODUCTS

2.01 GENERAL

A. Fixtures shall be of the types, wattages and voltages shown on Drawings.

B. Fixtures shall be UL listed as an entire assembly and for the installed location.
C. Fixtures’ mounting trim shall be compatible with ceiling material, coordinate with Drawings for each location. Fixtures delivered which are not compatible shall be returned and replaced at Contractor’s expense.

D. Luminaire recessed in fire rated ceiling shall conform to UL Standards, equipped with yoke where in tee ceiling and field fabricated fire protection box in accordance with latest UL Fire Resistance Directory.

E. Fluorescent luminaire lenses shall be Pattern 12 of 100% virgin acrylic with 0.125" thickness except shown or specified otherwise.

F. Equip exposed fluorescent lamps with safety lamp holders or wire guard.

G. Deliver fixtures and other lighting equipment complete with suspension accessories, canopies, castings, sockets, holders, reflectors, ballasts, diffusing material, louvers, frames, and recessing boxes all wired and assembled.

H. Hangers: Swivel-type to allow for free movement of 45 degrees from vertical at canopy and at luminaire housing. Steel tube hangers shall include a 1/16-inch diameter galvanized wire cord or equivalent (100-pound break strength) in stem assembly attached to luminaire housing and building structure. Attach loop with C-type tool applied compression splice.

I. All metal halide lamp luminaires shall be the enclosed type with diffuser or lens to withstand an arc tube rupture.

J. Louvers for fluorescent luminaires which are removable for re-lamping but not hinged shall be securely fastened near each end between the fixture housing and louvers using No. 16 jack chain.

2.02 BALLASTS

A. Ballast(s) in luminaire recessed in fire rated ceiling shall be approved for such use.

B. Ballast installed indoors shall be of encapsulated type for noise control.

C. Use appropriate rated ballast in high or low temperature applications.

D. Compact fluorescent and fluorescent lamp ballasts
   1. Ballasts shall be programmed rapid start.
   2. Ballasts shall be UL 935 listed, Class P, Type 1 Outdoor, CSA Certified where applicable.
   3. The ballast shall meet or exceed ANSI C82.11, where applicable.
   4. The ballast shall withstand transients specified within ANSI C62.41 Cat. A.
   5. THD (Total Harmonic Distortion) shall be less than 10%.
   6. Ballast power factor shall be greater than 98%.
   7. The ballast shall have an audible noise rating of Class A or better.

E. High intensity discharge (HID) lamp ballasts
   1. Ballasts shall be premium constant wattage (regulator stabilized) type, designed in accordance with all applicable ANSI specifications including ANSI C82.4 and UL 1029.
2. Power factor shall be greater than 90%.
3. Provide protective fusing with HID ballasts or HID fixtures.

F. Lamps
1. Provide lamps in all lighting fixtures shown.
2. Type as noted on the plans, T8 unless noted otherwise.
3. Approved manufacturers are General Electric, Osram Sylvania or equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Locate all lighting fixtures by reference to Drawings.

B. Report proposed changes for luminaire locations found necessary due to interference with structure, pipes, ducts, and other items to Owner's representative for direction before installation. Luminaires specified with overall lengths are subject to change. Adjust as directed by Owner's representative.

C. Contractor shall be responsible to coordinate with ceiling installation trade. This will assure that proper fixture type will be furnished to match ceiling system specified.

3.02 INSTALLATION

A. Luminaires shall be properly grounded per CEC Article 410, Parts 17 through 21.

B. Luminaires recessed in fire rated ceilings shall be in accordance with UL Fire Resistance Directory.

C. Install all luminaires true and plumb. Support and mount in accordance manufacturer's instructions and with CEC Article 410, Parts 16 and 76.

3.03 ADJUSTING

A. Particular care shall be used to eliminate light leaks around edge of recessed fixture trims.

3.04 CLEANING

A. Clean all glass and plastic and polish all visible metal parts before submitting job to Owner's representative for final acceptance. Remove all fingerprints and dirt from exposed surfaces. Replace scratched or damaged components at the Contractor's expense.

END OF SECTION