



# **Del Norte County**

## **Roy Lift Station Emergency Power Project**

July 2026

Contract Documents

County Service Area No. 1  
Project # 2065

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**Del Norte County**

**Roy Lift Station Emergency Power Project**

July 2026

Prepared for

Del Norte County Service Area No. 1  
Project # 2065  
981 H Street, Suite 110  
Crescent City, CA 95531  
(707) 464-7229

Prepared by

GHD Inc.  
718 Third Street,  
Eureka, CA 95501  
(707) 443-8326

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## ADVERTISEMENT FOR BIDS

Del Norte County  
981 H Street, Suite 110  
Crescent City, California 95531

*Del Norte County* is currently advertising for contractor bids regarding its “Roy Lift Station Emergency Power Project”.

Each bid must be submitted in a sealed envelope and must be plainly marked on the outside as Bid for: Roy Lift Station Emergency Power Project and the envelope should bear on the outside the Bidder’s name, address, license number, and Department of Industrial Relations (DIR) registration number. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the County Del Norte Service Area No. 1, Rosanna Bower, Community Development Department, 981 H Street, Suite 110, Crescent City, CA 95531. The Bidder is solely responsible for timely delivery of their bid.

A non-mandatory pre-bid site visit will be held to familiarize potential Bidders with the project. The visit will start at Community Development Department, 981 H St., Suite 110, Crescent City, California on **Wednesday, July 29, 2026 at 2:00 p.m. PDT.**

The bid opening is scheduled to occur at the Community Development Department, 981 H St., Suite 110, Crescent City, CA on **Monday, August 10, 2026 at 2:00 p.m. PDT.**

The Work at the lift station site generally includes but is not limited to, site preparation and grading, concrete pad construction, installation of a fixed-position propane generator (provided by Owner), propane tank, generator enclosure, security fencing and miscellaneous electrical hardware switches and wiring, and connections to electrical and communication panels as shown on the Plans and described in these Specifications.

The Contract Documents are currently available and may be examined at the following locations:

- *Humboldt Builders Exchange, Eureka*
- *North Coast Builders Exchange, Santa Rosa*
- *Shasta Builders Exchange, Redding*
- *Medford Builders Exchange, Medford*
- *Construction Bidboard, San Diego*
- *Dodge Data & Analytics, New York*
- *Placer County Contractors Association & Builders Exchange, Roseville*

Contractors may obtain an electronic copy of the Contract Documents for no cost at the following website: <https://www.co.del-norte.ca.us/departments/EngineeringSurveying/BIDDdocuments>

The Contract Documents originally posted for review include preliminary 90% drawings. Final bidding documents will be issued by addendum prior to bid opening and shall govern the Work. Contractors are encouraged to carefully read the “Information for Bidders” section in the Contract Documents. Questions concerning these documents must be submitted by email to [rbower@co.del-norte.ca.us](mailto:rbower@co.del-norte.ca.us) and [jonathan.olson@co.del-norte.ca.us](mailto:jonathan.olson@co.del-norte.ca.us). Addenda will be posted at the above listed website. It is bidder’s responsibility to check website for addenda up to 72 hours in advance of bid opening.

Del Norte County  
Roy Lift Station Emergency Power Project

The general prevailing wage rates applicable to the Work are set by the State Director of DIR State of California under Labor Code Section 1771.4. The Contractor will be required to comply with any changes in these wage rates as they are updated by the State government at no cost to the Owner. Prevailing rates are available online at <http://www.dir.ca.gov/DLSR>.

Rosanna Bower  
Assistant County Engineer  
*Del Norte County Service Area No. 1*

### BIDDING REQUIREMENTS SUMMARY

1. PROJECT TITLE: Roy Lift Station Emergency Power Project
2. BID OPENING: In-Person Bid Opening  
**Monday, August 10, 2026**  
2:00 p.m. Pacific Daylight Time  
Community Development Department  
**981 H Street Suite 110, Crescent City, CA 95531**
3. QUESTION SUBMITTAL: Project Question Submission Deadline  
**Monday, August 3, 2026**  
5:00 p.m. Pacific Daylight Time
4. PROJECT BID CONTACT: Rosanna Bower, rbower@co-del-norte.ca.us  
Jonathan Olson, jonathan.olson@co.del-norte.ca.us
5. PRE-BID SITE VISIT: In-Person, non-mandatory  
Starts at 981 H St., Suite 110,  
Crescent City, California  
**Wednesday, 29 July 2026**  
2:00 p.m. PDT
6. BID SECURITY: 10% of maximum amount of bid
7. CONSTRUCTION TIME PERIOD: One hundred eighty (180) Calendar Days
8. LIQUIDATED DAMAGES: \$2,000.00 per calendar day
9. LABOR AND MATERIALS PAYMENT BOND: 100% of the base bid
10. PERFORMANCE AND WARRANTY BOND: 100% of the base bid
11. PREVAILING WAGE RATES: Yes
12. BID VALID FOR: Ninety (90) days
13. COST FOR EACH CONTRACT DOCUMENT SET: \$0  
Electronic only

14. BUILDERS EXCHANGES ISSUED  
CONSTRUCTION DOCUMENTS

Humboldt Builders Exchange  
1213 5<sup>th</sup> Street  
Eureka, CA 95501  
(707) 442-3708  
[Hbe-info@humbx.com](mailto:Hbe-info@humbx.com)

North Coast Builders Exchange  
1030 Apollo Way  
Santa Rosa, CA 95407  
(707) 542-9502

Shasta Builders Exchange  
1355 Hartnell Avenue  
Redding, CA 96002  
(530) 221-5556  
[planroom@shastabe.com](mailto:planroom@shastabe.com)

Medford Builders Exchange  
701 East Jackson St.  
Medford, OR 97504  
(541) 773-5327

Construction Bidboard (Ebidboard)  
11622 El Camino Real, #100  
San Diego, CA 92130  
(800) 479-5314  
[support@ebidboard.com](mailto:support@ebidboard.com)

Dodge Data & Analytics  
830 Third Avenue, 6th Floor  
New York, NY 10022  
(877) 784-9556  
[support@construction.com](mailto:support@construction.com)

Placer County Contractors Association & Builders  
Exchange  
10656 Industrial Avenue, Suite 160  
Roseville, CA 95678  
(916) 771-7229  
[planroom@srbx.org](mailto:planroom@srbx.org)

## INFORMATION FOR BIDDERS

Project: Roy Lift Station Emergency Power Project

**Bid Information.** Bids will be received by Del Norte County Service Area 1 (herein called the "Owner"), at the Community Development Department, 981 H Street, Suite 110, Crescent City, California, 95531 until the time listed in the Advertisement for Bids; and then at said office publicly opened and read aloud.

Each bid must be submitted in a sealed envelope and must be plainly marked on the outside as noted in the Advertisement for Bids. If forwarded by mail, follow requirements as noted in the Advertisement for Bids.

Bids received after the time specified opening will not be considered. The Bidder is solely responsible for timely delivery of their bid.

Each proposal must be submitted on the prescribed form and accompanied by a certified check or Bid Bond. Successful Bidders will be required to furnish both a Payment Bond and Performance Bond in the full amount of the Contract Price.

**Pre-Bid Conference.** A non-mandatory pre-bid conference/site visit will be held to familiarize potential bidders with the project. See the Advertisement for Bids for location, date, and time.

**Form of Proposal.** All bids must be made on the required bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required.

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No Bidder may withdraw a bid within ninety (90) days after the actual date of the opening thereof except as authorized for material error under Public Contract Code Section 5100 et seq. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

**Local Conditions.** Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the Plans and Specifications including addenda. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of Work or of the nature of the Work to be done.

The Contract Documents contain the provisions required for the construction of the project. Information obtained from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve them from fulfilling any of the conditions of the Contract.

**Contract Bonds.** Each bid must be accompanied by a bid bond executed by a surety licensed to do business in the State of California payable to the Owner, for ten percent of the total amount of the bid. As soon as the bid prices have been compared, the Owner will return the bonds of all except the three lowest responsible bidders. When the Agreement is executed, the bonds of the two remaining unsuccessful bidders will be returned. The bid bond of the successful Bidder(s) will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a bid bond.

A performance bond and a payment bond, each in the amount of 100 percent of the contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the Contract. In

accordance with Public Contract Code Section 10263 the Contractor will be allowed to substitute securities for monies normally withheld by the owner to insure performance under this contract.

A warranty bond in the amount of 15 percent of the final contract price for the one year period commencing with recordation of the Notice of Completion, with a corporate surety approved by the Owner, will be required for the faithful performance of the Contract.

Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney.

The party to whom the Contract is awarded will be required to execute the Agreement and obtain the performance bond, payment bond and required insurance certificates within ten (10) calendar days from the date when Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement and bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may at his option consider the Bidder in default, in which case the bid bond accompanying the proposal shall become the property of the Owner.

The Owner, within ten (10) calendar days of receipt of an acceptable performance bond, payment bond and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may submit a written notice to protest his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

**Notice to Proceed.** The Notice to Proceed shall be issued within twenty one (21) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor.

If the Notice to Proceed has not been issued within the twenty one (21) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

**Basis of Award.** The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work contemplated therein.

A conditional or qualified bid will not be accepted if it modifies the Plans or Specifications or method of Work. The intent is to award the entire job (all Schedules thereunder) to such Contractor or Contractors that will result in the lowest overall total cost to the Owner.

Award will be made to the lowest, responsive, responsible Bidder(s) based on total bid.

All applicable laws, ordinances, rules and regulations of all Federal, State and local authorities having jurisdiction over construction of the project shall apply to the Contract throughout.

The Bidder shall supply the names and addresses of major subcontractors, material suppliers and/or fabricators with the bid.

**Contract Documents.** The Contract Documents under which it is proposed to execute the Work consist of the Plans and all material bound herewith. These Contract Documents are intended to be mutually cooperative and to provide all details reasonably required for the execution of the proposed Work. Any person contemplating the submission of a Bid shall have thoroughly examined all the various parts of these Documents, and should there be any doubt as to the meaning or intent of said Contract

Documents, the Bidder should request of the Owner's Representative, in writing at least seven (7) calendar days prior to bid opening, an interpretation thereof. Any interpretation or change in said Contract Documents will be made only in writing, in the form of addenda and will be furnished to all Bidders receiving a set of the Documents, who shall submit, or indicate receipt of all addenda with their proposals. The Owner will not be responsible for any other explanation or interpretations of said Documents.

Questions regarding the Plans and Specifications shall be submitted in writing to Rosanna Bower and Jonathan Olson at 981 H Street, Suite 110, Crescent City, CA 95531, or by email at [rbower@co.del-norte.ca.us](mailto:rbower@co.del-norte.ca.us) and [jonathan.olson@co.del-norte.ca.us](mailto:jonathan.olson@co.del-norte.ca.us). Replies to such inquiries will be in the form of addenda or clarifications that will be submitted to all plan holders.

Contractors may download an electronic copy of the Contract Documents at no cost at the following website: <https://www.co.del-norte.ca.us/departments/EngineeringSurveying/BIDDdocuments>

The Contract Documents are assembled, arranged, and titled generally in conformance with the 50-division format suggested by the Construction Specifications Institute (CSI). Minor variations to the CSI format may be used herein to suit Owner requirements or to better adapt the Documents to particular types of projects.

Portions of these Contract Documents may contain standard preprinted material. The Bidder's attention is called to the General Conditions of the Contract which may modify and add to the preprinted material contained herein. Sentences in the Contract Documents which are phrased in mandatory language, but which include no explicit reference to the party who has responsibility for performing the mandated duty, shall be interpreted as imposing responsibility for performance of the duty described on the Contractor. For example, a directive that "the site shall be kept clean" would impose the duty of keeping the site clean on the Contractor.

Where the Bid Proposal is to be submitted on a unit price basis, unit prices will be accepted on all items of Work set forth in the Bid, except those designated to be paid for as a lump sum. The estimate of quantities of Work to be done is tabulated in the Bid and, although stated with as much accuracy as possible, is approximate only and is assumed solely for the basis of calculation upon which the award of Contract shall be made. Payment to the Contractor will be made on the measurement of the Work actually performed by the Contractor as specified on the Contract Documents. The Owner reserves the right to increase or diminish the amount of any class of Work as may be deemed necessary.

When the Bid Proposal is to be submitted on a lump sum basis, a single lump sum price shall be submitted in the appropriate place. The total amount to be paid the Contractor shall be the amount of the lump sum in the Bid, as adjusted for additions or deletions resulting from changes in construction. After award of Contract, the Contractor may be required to break down the lump sum Bid into unit prices for the various portions to be completed.

All blank spaces in the Bid form must be filled in, in ink, in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in cases of discrepancy between the amounts stated in writing and the amounts stated in figures. In case of discrepancy between unit prices and totals, unit prices will prevail.

Any Bid Proposal shall be deemed informal which contains omissions, erasures, alterations, or additions of any kind, or prices uncalled for, or in which any of the prices are obviously unbalanced, or which in any manner shall fail to conform to the conditions of the published Advertisement for Bid.

The Bidder shall sign their Bid Proposal in the blank space provided therefore. If Bidder is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If Bidder is a co-partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign contracts in behalf of the co-partnership. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening of Proposals or submitted with the Proposal, otherwise the Proposal will be regarded as not

properly authorized.

State and local sales and use taxes, as required by the laws and statutes of the State and its political subdivisions, shall be paid by the Contractor. Prices quoted in the Proposal shall include sales tax unless provision is made in the Bid Proposal form to separately itemize the tax.

Any Bidder may modify their bid by email or written communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the Owner prior to the closing time. The communication should not reveal the bid price, but should state the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened.

Each Bidder must inform themselves of the conditions relating to the execution of the Work, and it is assumed that they will inspect the site, subsurface conditions, weather, variations of soil moisture and workability with rainfall, and make themselves thoroughly familiar with all the Contract Documents. The Bidder should check with local contractors regarding local site, surface, subsurface and material conditions and variability. Failure to do so will not relieve the successful Bidder of his obligation to enter into a Contract and complete the contemplated Work in strict accordance with the Contract Documents. The Bidder's attention is called to the General Conditions and Supplementary Conditions (if included) of the Contract Documents in regards to the Bidder's obligation to verify for themselves and to his complete satisfaction all information concerning site and subsurface conditions, and Notice requirements.

Each Bidder shall inform themselves of, and the Bidder awarded a Contract shall comply with, Federal, State and local laws, statutes, and ordinances relative to the execution of the Work. This requirement includes, but is not limited to, grant requirements as they apply to the Contractor's work, applicable regulations concerning employment of labor, protection of public and employee safety and health, environmental protection, the protection of natural resources, fire protection, burning and non-burning requirements, permits, fees, and similar subjects.

**License(s).** The successful bidder and its Subcontractor(s) must possess the California contractor's license(s) in the classification(s) required by law to perform the Work.

**DIR Registration.** Owner will not accept a Bid Proposal from or enter into the Contract with a bidder, without proof that the bidder and its Subcontractors are registered with the DIR to perform public work under Labor Code Section 1725.5, subject to limited legal exceptions.

**Ineligible Subcontractor.** Any Subcontractor who is ineligible to perform work on a public works project under Labor Code Sections 1777.1 or 1777.7 is prohibited from performing work on this Project.

**Bid Protest.** Any bid protest must be in writing and received by CSA-1, at Community Development Department, 981 H Street, Suite 110, Crescent City, California, 95531 before 5:00 p.m. no later than two working days following bid opening (the "Bid Protest Deadline") and must comply with the following requirements:

Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors 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. If required by Owner, the protesting bidder must submit a nonrefundable fee in the amount specified by Owner, based upon Owner's reasonable costs to administer the bid protest. Any such fee must be submitted to Owner no later than the Bid Protest Deadline, unless otherwise specified.

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.

A copy of the protest and all supporting documents must be concurrently transmitted by email 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.

The protested bidder may submit a written response to the protest, provided the response is received by Owner before 5:00 p.m., within three 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.

A copy of the response and all supporting documents must be concurrently transmitted by fax or by email, by or before the Response 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.

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.

Owner 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.

**Evidence of Responsibility.** Within 24 hours following a request by Owner, a bidder must submit to the Owner satisfactory evidence showing the bidder's financial resources, the bidder's experience in the type of work being required by the Owner, the bidder's organization available for the performance of the Contract and any other required evidence of the bidder's qualifications to perform the proposed Contract. The Owner may consider such evidence before making its decision awarding the proposed Contract.

**Labor Compliance.** This is a Public Works Project, and CA State prevailing wage rates will be required on this project. Pursuant to CA Labor Code 1725.5 all contractors and subcontractors must be currently registered and be in good standing with the Department of Industrial Relations to be listed on a bid and work on a public works project. All contractors must electronically submit their payroll to the Department of Industrial Relations and submit their payroll to the Prime Contractor. All contractors and subcontractors working on this project must keep certified payroll records in accordance with Labor Code 1776.

In accordance with Labor Code 1720, the Division of Labor Standards and Research has determined the general prevailing rates or wages and employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in section 1773.8. Holiday and overtime work, when permitted by law, shall be paid for at a rate of at least one and one-half times the above specified rate of per diem wages, unless otherwise specified.

It shall be mandatory upon the Contractor herein and upon any Subcontractor to pay not less than the said specified rates to all laborers, workers and mechanics employed by them in the execution of the Agreement pursuant to CA Labor Code 1774.

Attention is directed to the provisions in section 1777.5 and sections 1777.6 of the Labor Code concerning the requirement to employ apprentices by all Contractors and comply with the provisions outlined in CA Labor Code 230.1.

The Contractor shall comply with and shall cause his subcontractors to comply with all laws and regulations governing the contractor's and subcontractor's performance on this project including, but not

limited to: anti-discrimination laws, workers' compensation laws, and prevailing wage laws as set forth in CA Labor Code, Sections 1720-1861 et seq. and licensing laws, as well as Federal Labor Standards set forth in the Davis-Bacon Act (40 USC 276(a-a5), the Copeland "Anti-Kickback" Act (40 USC 276©; and the Contract Work Hours and Safety Standards Act (CWHSSA) (40 USC 327-333). The contractor is required to include the prevailing wage language in all subcontracts pursuant to CA Labor Code 1775(E)(b)(1). The Contractor shall post, at appropriate conspicuous points on the site of the Project, a schedule showing all the determined general prevailing wage rates.

The Contractor agrees to comply with Labor Code Section 1775 (Payment of the Prevailing Wage Rates) and Labor Code 1776 (keeping accurate records) and Labor Code 1777.5, placing responsibility for compliance with the statutory requirements for all apprenticeable occupations on the prime contractor. The Contractor shall comply with the requirements imposed by the California Labor Code Sections 1720 through 1861 regarding public works projects and prevailing wage laws and sections 16000-16800 of the CA Code of Regulations.

Contractors and any Subcontractors shall be assessed penalties for violating the following labor codes:

1815 for underpayment of any hours worked over 8 hours per day or 40 hours a week, with penalties assessed pursuant to CA Labor Code 1813 for overtime, \$25.00 per worker per calendar day;

1775 for underpayment of the prevailing wage, not more than \$200.00 per day per worker, and not less than \$40.00;

1776 for inaccurate or incomplete payroll records, \$100.00 per each calendar day, or portion thereof, for each worker, until strict compliance is effectuated.

All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (Division of Labor Standards Enforcement), electronic Certified Payroll Reporting (eCPR) at the DIR, and also directly submit certified payroll and supporting documents to Del Norte County Service Area No. 1. Below is the contact information for Del Norte County Service Area No. 1:

Address: Del Norte County Service Area No. 1  
Attn: Rosanna Bower  
981 H Street, Suite 110  
Crescent City, CA 95531  
Email: [rbower@co.del-norte.ca.us](mailto:rbower@co.del-norte.ca.us)

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractors shall be subject to withholding of progress or final payments if prevailing wage compliance is incomplete or has not been submitted by Contractor or any Subcontractor.

**BIDDERS' CHECKLIST**

This checklist has been prepared and furnished to aid bidders in including all necessary supporting information with their bid. Bidders' submittals should include, but are not limited to the following:

<u>ITEM</u>	<u>CHECKED</u>
1. Bid Proposal	_____
2. Acknowledgement of Addenda	_____
3. Authority to Sign Bid Proposal (if applicable)	_____
4. Bid Bond	_____
5. Power of Attorney (Attached to Bid Bond)	_____
6. Subcontractor List	_____
7. Non-Collusion Declaration	_____
8. Workers Compensation Certification	_____

(PAGE NOT USED)

**BID**

Proposal of \_\_\_\_\_  
(hereinafter called "Bidder"), organized and existing under the laws of the State of California,

doing business as \_\_\_\_\_\*.

To Del Norte County Service Area No.1, (hereinafter called "Owner").

In compliance with your Advertisement for Bids, Bidder hereby proposes to perform all Work for the Roy Lift Station Emergency Power Project in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

In the event of a difference between a price quoted in words and a price quoted in figures for the same quotation, the words shall be the amount bid. In the event that the product of a unit price and an estimated quantity does not equal the extended amount quoted, the unit price shall govern and the corrected product of the unit price and the estimated quantity shall be deemed to be the amount bid. If the sum of two or more items in a bidding schedule does not equal the total amounts quoted, the individual items amounts shall govern and the corrected total shall be deemed to be the amount bid.

By submission of this bid, each Bidder certifies, and in the case of a joint bid, each party certifies as to their own organization, that their bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid with any other Bidder or with any competitor.

Bidder hereby agrees to commence Work under this Contract on or before a date to be specified in the Notice to Proceed and to fully complete the project and pay the liquidated damages as provided in Articles III and IV of the General Conditions.

\*Insert "a corporation," "a partnership," or "an individual" as applicable.

**BID PROPOSAL**

BID SCHEDULES

Bidder agrees to perform all the Work described in the Contract Documents for the following lump sum. Bidder is advised to carefully review all sections of the Plans and Specifications to completely understand the Work and all constraints including the schedule and material requirements.

The Work includes installation of a new generator (provided by Owner), generator structure, and associated tasks. Specific tasks are outlined in the Contract Documents and generally include, but are not limited to minor demolition, site preparation and grading, concrete pad construction, utility installation, installation of a new fixed-position propane generator (provided by Owner), installation of a new propane tank (see Specification 01 20 00 for Contractor requirements), installation of a new generator enclosure, installation of miscellaneous electrical hardware switches and wiring, panels, and installation of security fencing.

The Lump Sum Bid shall be comprehensive and shall include all work associated with the project.

The following table has been provided for the Bidder's convenience to assist Bidder in quantifying the major components of the Work, and shall in no way be interpreted to be comprehensive.

<b>BASE BID</b>					
Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
1.	Mobilization/Demobilization	LS	1	\$ _____	\$ _____
2.	Improvements at Roy Lift Station Site	LS	1	\$ _____	\$ _____
<b>TOTAL BASE BID (In Numbers)</b>					\$ _____
<b>TOTAL BASE BID (In Words)</b>					

ADDITIVE BID ITEMS					
Item No.	Description	Unit	Qty.	Unit Cost	Total Cost
A1	Upgrading from Type 1 Structure (Slab with Canopy) to Type 2 Structure (CMU Building)	LS	1	\$ _____	\$ _____
<b>TOTAL ADDITIVE BID (In Numbers)</b>					\$ _____
<b>TOTAL ADDITIVE BID (In Words)</b>					

TOTAL BID	
<b>TOTAL BID – Total Base Bid Plus Total Additive Bid (In Numbers)</b>	\$ _____
<b>TOTAL BID (In Words)</b>	
_____	
_____	
<p>The TOTAL BID shall be the Total Base Bid Plus Total Additive Bid. The TOTAL BID shall be the basis for determining the Apparent Low Bidder. The Owner reserves the right to award the Base Bid plus any or all additive items. Mobilization/Demobilization for additive items is covered under Base Bid Item 1.</p>	

Bid for Roy Lift Station Emergency Power Project, for the construction of all the work, including all necessary labor, materials, equipment and sales tax and all other applicable taxes and fees:

TOTAL OF BID (\$ \_\_\_\_\_)

TOTAL OF BID IN WORDS: \_\_\_\_\_

Del Norte County  
Roy Lift Station Emergency Power Project

Receipt of the following Addenda is acknowledged:

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The representations made herein are made under penalty of perjury.

Respectfully submitted:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
License Number

\_\_\_\_\_  
Date

\_\_\_\_\_  
License Expiration Date

(SEAL - If Bid is by Corporation)

### BID BOND

\_\_\_\_\_ (“Bidder”) has submitted a bid, dated \_\_\_\_\_, 20 \_\_\_\_\_ (“Bid”), to Del Norte County (“Owner”) for work on the Roy Lift Station Emergency Power Project (“Project”). Under this duly executed bid bond (“Bid Bond”), Bidder as Principal and

\_\_\_\_\_, its surety (“Surety”), are bound to County as obligee in the penal sum of ten percent of the maximum amount of the Bid (the “Bond Sum”). Bidder and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, as follows:

**General.** If Bidder is awarded the Contract for the Project, Bidder will enter into the Contract with the County in accordance with the terms of the Bid.

**Submittals.** Within ten days following issuance of the notice of award to Bidder, Bidder must submit to County the following:

**Contract.** The executed Contract, using the form provided by District in the Project contract documents (“Contract Documents”);

**Payment Bond.** A payment bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Payment Bond form included with the Contract Documents;

**Performance Bond.** A performance bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Performance Bond form included with the Contract Documents; and

**Insurance.** The insurance certificate(s) and endorsement(s) required by the Contract Documents, and any other documents required under the Instructions to Bidders.

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

**Enforcement.** If Bidder fails to execute the Contract and to submit the bonds and insurance certificates as required by the Contract Documents, Surety guarantees that Bidder forfeits the Bond Sum to County. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: \_\_\_\_\_  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Email: \_\_\_\_\_

**Duration; Waiver.** If Bidder fulfills its submittal obligations above, then this obligation will be null and void; otherwise it will remain in full force and effect for 90 days following award of the Contract or until this Bid Bond is returned to Bidder, whichever occurs first. Surety waives the provisions of Civil Code Sections 2819 and 2845.

This Bid Bond is entered into and effective on \_\_\_\_\_, 20\_\_\_\_\_.

SURETY:

\_\_\_\_\_

s/ \_\_\_\_\_

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

Title: \_\_\_\_\_

(Attach Acknowledgement, Notary Seal, and Attorney-In-Fact Certificate)

CONTRACTOR:

\_\_\_\_\_

s/ \_\_\_\_\_

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

Title: \_\_\_\_\_

**SUBCONTRACTOR LIST**

The Bidder certifies that:

- A.  I do not intend to subcontract any Work on this project.
- B.  I do intend to subcontract portions of the Work on this project.

NOTE: The Bidder shall check box A or box B. If the Bidder does not check a box, it will be deemed that Bidder has checked box A.

If awarded the Contract, the Bidder proposes to employ the following subcontractors who will perform Work or labor or render service to the Bidder in or about the Work in an amount in excess of one-half of one percent (0.5%) of the total amount of Bidder's proposal. If no subcontract Work is proposed, except within the one-half of one percent (0.5%) limit set forth, the Bidder shall so state. **Note to Bidders: Please print legibly. Illegible forms may be rejected.**

DESCRIPTION OF WORK	SUBCONTRACTOR NAME	CALIFORNIA CONTRACTOR LICENSE NO.	LOCATION OF BUSINESS	DIR REG. NO.

**NON-COLLUSION  
DECLARATION**

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid.

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

This declaration is intended to comply with California Public Contract Code Section 7106 and Title 23 U.S.C Section 112.

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].

s/ \_\_\_\_\_

\_\_\_\_\_  
Name and Title [print]

**CONTRACTOR'S CERTIFICATION REGARDING WORKERS'  
COMPENSATION INSURANCE**

**State of California**

County of \_\_\_\_\_

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

\_\_\_\_\_  
(Name of Contractor)

by: \_\_\_\_\_

\_\_\_\_\_  
(Signature of Contractor)

Date: \_\_\_\_\_

### **ANTI-LOBBYING CERTIFICATION**

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in conformance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

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.

**CONTRACT AGREEMENT**

THIS AGREEMENT, MADE THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_, by and  
between the Del Norte County Service Area No.1, hereinafter called "Owner," and

\_\_\_\_\_ ,  
doing business as \_\_\_\_\_.  
(insert "a corporation," "a partnership," or "an individual" as applicable).

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The Contractor will commence and complete the:  
Roy Lift Station Emergency Power Project
2. The Contractor will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the project described herein.
3. The Contractor will commence the Work required by the Contract Documents within  
30 calendar days after the date of the Notice to Proceed and will complete the same within the time provided in Section B-35 of the General Conditions, unless the period for completion is extended otherwise by the Contract Documents.
4. The Contractor agrees to perform all of the Work described in the Contract Documents and comply with terms therein for the sum as shown in the Bid Schedule.
5. The Contract Documents consist of the Bidding Requirements, Contract Forms, Conditions of the Contract, the Specifications, and the Plans, including all modifications thereof incorporated into the documents before their execution, and including all other requirements incorporated by specific reference thereto. These form the Contract.
6. The Owner will pay to the Contractor in the manner and at such times as set forth in the General Conditions such amounts as required by the Contract Documents.
7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized security officials, this Agreement in quadruplicate, each of which shall be deemed an original on the date first above written.

\_\_\_\_\_  
Owner  
  
Title \_\_\_\_\_  
  
Date \_\_\_\_\_

\_\_\_\_\_  
Contractor  
  
Title \_\_\_\_\_  
  
Date \_\_\_\_\_

(PAGE NOT USED)

**PERFORMANCE BOND**

KNOW ALL PEOPLE BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_, hereinafter  
(Corporation, Partnership, or Individual)

called Principal, and \_\_\_\_\_  
(Name of Surety)

\_\_\_\_\_  
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

\_\_\_\_\_  
Del Norte County Service Area No. 1  
(Name of Owner)

\_\_\_\_\_  
981 H Street, Suite 110, Crescent City CA, 95531  
(Address of Owner)

hereinafter called Owner, in the penal sum of

\_\_\_\_\_ Dollars (\$  
\_\_\_\_\_)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain Contract with the Owner, dated \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

\_\_\_\_\_  
Roy Lift Station Emergency Power Project

NOW, THEREFORE, If the Principal shall well, truly and faithfully perform its duties, all the undertaking, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety and during one year (minimum) guaranty period, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder of the Specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in \_\_\_ counterparts, each one of which shall be deemed an original, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

ATTEST:

\_\_\_\_\_  
(Principal) Secretary

\_\_\_\_\_  
Principal

By \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

ATTEST:

\_\_\_\_\_  
Witness as to Surety

By \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

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

**PAYMENT BOND**

KNOW ALL PEOPLE BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_, hereinafter  
(Corporation, Partnership, or Individual)

called Principal, and \_\_\_\_\_  
(Name of Surety)

\_\_\_\_\_  
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

\_\_\_\_\_  
Del Norte County Service Area No. 1  
(Name of Owner)

\_\_\_\_\_  
981 H Street, Suite 110, Crescent City CA, 95531  
(Address of Owner)

hereinafter called Owner, in the penal sum of

\_\_\_\_\_ Dollars (\$  
\_\_\_\_\_)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain Contract with the Owner, dated \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

\_\_\_\_\_  
Roy Lift Station Emergency Power Project

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such Work, and all insurance premiums of said Work, and for all wages and fringe benefits of labor, performed in such Work, whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulated and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the

right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in \_\_\_\_ counterparts, each one of which shall be deemed an original, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

ATTEST:

\_\_\_\_\_  
(Principal) Secretary

\_\_\_\_\_  
Principal

By \_\_\_\_\_

\_\_\_\_\_  
Address

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

ATTEST:

\_\_\_\_\_  
Witness as to Surety

By \_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

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

## WARRANTY BOND

Del Norte County Service Area No. 1 ("Owner") and \_\_\_\_\_

\_\_\_\_\_ ("Contractor") have entered into a contract, dated \_\_\_\_\_, 20\_\_\_\_ ("Contract") for work on the Roy Lift Station Emergency Power Project ("Project"). The Contract is incorporated by reference into this Warranty Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and \_\_\_\_\_, its surety ("Surety"), are bound to County as obligee in the maximum amount of 15% of the final Contract Price
2. **Warranty Period.** The Contract requires Contractor to guarantee its work and that of its Subcontractors on the Project, against defects in materials or workmanship which are discovered during the one year period commencing with recordation of the Notice of Completion (the "Warranty Period").
3. **Surety's Obligations.** If Contractor faithfully carries out and performs its guarantee under the Contract, and, on due notice from County, repairs and make good at its sole expense any and all defects in materials and workmanship in the Project which are discovered during the Warranty Period, or if Contractor promptly reimburses County for all loss and damage that County sustains because of Contractor's failure to makes such repairs in accordance with the Contract requirements, then Surety's obligations under this Bond will be null and void. Otherwise, Surety's obligations will remain in full force and effect.
4. **Waiver.** Surety waives the provisions of Civil Code Sections 2819 and 2845.
5. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:  
  
Attn: \_\_\_\_\_  
Address: \_\_\_\_\_  
District/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Email: \_\_\_\_\_
6. **Law and Venue.** This Bond will be governed by California law, and any dispute pursuant to this Bond will be venued in the Superior Court in which the Project is located, and no other place. Surety will be responsible for County's attorneys' fees and costs in any action to enforce the provisions of this Bond.
7. **Effective Date; Execution.** This Bond is entered into and is effective on \_\_\_\_\_, 20\_\_\_\_. Three identical counterparts of this Bond, each of which is deemed an original for all purposes, are hereby executed and submitted.

[Signatures on following page.]

SURETY:

\_\_\_\_\_ Principal \_\_\_\_\_ Principal

By: \_\_\_\_\_  
Surety

By: \_\_\_\_\_  
Attorney-in-Fact

By: \_\_\_\_\_  
California Resident Agent

By: \_\_\_\_\_  
Non-resident Agent – Attorney-in-Fact

(Attach Acknowledgment with Notary Seal and Power of Attorney)

**NOTICE OF AWARD**

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT: Roy Lift Station Emergency Power Project

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for BIDS dated \_\_\_\_\_ and Information for BIDDERS.

You are hereby notified that your BID has been accepted for items in the amount of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

You are required by the Information for BIDDERS to execute the Agreement and furnish the required Contractor's certificates of insurance within ten (10) calendar days from the date this Notice is received by you.

If you fail to execute said Agreement and to furnish said INSURANCE within ten (10) calendar days from the date of receipt of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

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

Owner: Del Norte County Service Area No. 1

By: \_\_\_\_\_ Title: \_\_\_\_\_

\*\*\*\*\*

**ACCEPTANCE OF NOTICE**

Receipt of the above NOTICE OF AWARD is hereby acknowledged by:

\_\_\_\_\_  
(Name of Contractor)

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

By: \_\_\_\_\_ Title: \_\_\_\_\_

**NOTICE TO PROCEED**

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT: Roy Lift Station Emergency Power Project

You are hereby notified to commence Work in accordance with the Agreement on or before the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, and you are to complete the Work within 120 calendar days thereafter.

The date of completion of all Work is therefore \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_  
\_\_\_\_\_.

You are required to return an acknowledged copy of this NOTICE OF PROCEED to the OWNER.

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

Owner: Del Norte County Service Area No. 1 \_\_\_\_\_

By: \_\_\_\_\_ Title: \_\_\_\_\_

\*\*\*\*\*

**ACCEPTANCE OF NOTICE**

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by:

\_\_\_\_\_  
(Name of Contractor)

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

By: \_\_\_\_\_ Title: \_\_\_\_\_

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## **SECTION A DEFINITIONS AND TERMS**

### A-1 General

Wherever the following abbreviations and terms, or pronouns in place of them, are used in these Conditions and other Contract Documents of which these Conditions are a part, the intent and meaning shall be interpreted as provided below.

### A-2 Abbreviations

The following abbreviations may be used in the Contract Documents:

AA	Aluminum Association
AASHO	American Association of State Highway Officials
ABMA	American Boiler Manufacturer's Association
ACI	The American Concrete Institute
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturer's Association
AI	The Asphalt Institute
AIA	American Institute of Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standards Committee
ANSI	American National Standards Institute, Inc.
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
CCMTC	California Concrete Masonry Technical Committee
CFR	Code of Federal Regulations
CEQA	California Environmental Quality Act
CDPH	California Department of Public Health
CRSI	Concrete Reinforcement Steel Institute
DFPA	Douglas Fir Plywood Association
ETL	Electrical Testing Laboratory
FS	Federal Specification
ICBO	International Conference of Building Officials
IEEE	The Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
MBMA	Metal Building Manufacturer's Association
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry Standards
MFMWS	Myers Flat Mutual Water System
NBFU	National Board of Fire Underwriters
NBS	National Buildings Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NVGDS	National Vertical Geographic Data System

OSHA	Occupational Safety and Health Act of 1970
PCA	Portland Cement Association
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
UBC	Uniform Building Code
USPHS	United States Public Health Service
UL	Underwriter's Laboratory
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USAS	The United States of America Standard Institute
WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California

"State" - State of California

"State Standard Specifications" – Current edition of the Standard Specifications issued by the State of California Business and Transportation Agency, Department of Transportation, dated, and as amended, unless a specific edition is referenced.

### A-3 Definitions

- a) Acceptance - The formal written acceptance by the OWNER of the entire Contract which has been completed in all respects in accordance with the Specifications and any approved modifications.
- b) Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, Plans and Specifications by additions, deletions, clarifications or corrections.
- c) As Approved - The words "as approved" unless otherwise qualified, shall be understood to be followed by the words "by the Engineer."
- d) Bid - The offer of the bidder for the Work when made out and submitted on the prescribed bid form, properly signed and guaranteed. A Bid is also known as a Proposal.
- e) Bid Bond - The cash, cashier's check, certified check, or bidder's bond accompanying the bid submitted by the bidder, as a guarantee that the bidder will enter into a Contract with the OWNER for the performance of Work herein described.
- f) Bidder - Any individual, firm, partnership or corporation submitting a bid for the Work contemplated, and acting directly or through a duly authorized representative.
- g) Change Orders - A written order to the Contractor authorizing an addition, deletion, or revision in the Work within the general scope of the Contract Documents or authorizing adjustment in the Contract price or Contract time.
- h) Claim - A separate demand by the Contractor for (i) a time extension, (ii) payment of money or damages arising from work done by or on behalf of the Contractor pursuant to the Contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (iii) an amount the payment of which is disputed by the OWNER.
- i) Contract - The written agreement covering the performance of the Work and the furnishing of labor, materials, tools and equipment in the construction of the Work. The Contract shall include all Contract Documents and supplemental agreements amending or extending the Work contemplated which may be required to complete the Work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the Contract and include Addenda and Contract Change Orders.

- j) Contract Documents - The Contract Documents are any or all of the document listed in Article I of the Contract.
- k) Contract Price - Total monies payable to the Contractor under the terms and conditions of the Contract Documents.
- l) Contract Time - The numbers of days stated in the Contract Documents for the completion of Work.
- m) Contractor - The person or persons, firm, partnership or corporation or other entity who has entered into the Contract with the OWNER to perform the Work.
- n) Contract Plans - "Contract Plans" or "Plans" means and includes:
  - (i) all Plans which have been prepared on behalf of the OWNER and which are included in the Contract Documents and all modifying Plans issued by addenda thereto;
  - (ii) all Plans submitted pursuant to the terms of the Contract by the Contractor with his proposal and by the Contractor to the OWNER during the progress of the Work when accepted by the Engineer.
- o) County - County of Del Norte, California.
- p) Date of Execution of the Contract - The date on which the Contract is signed by the OWNER's authorized representative.
- q) Datum - The figures given in the Specifications or upon the Plans after the word "Elevation" or an abbreviation of it shall mean NAVD 88 datum.
- r) Days - Unless otherwise designated, days as used in the Contract Documents shall mean calendar days.
- s) Engineer - Wherever in these documents the word "Engineer" appears, it shall be understood to mean GHD Inc. The County will have final authority as regards to contract administration, field inspection, and related items.
- t) Field Order - A written order affecting a change in the Work not involving an adjustment in the Contract Price or an extension of Contract Time, issued by the Owner's Representative to the Contractor during construction.
- u) His - "His" shall include "her" and "its".
- v) Install - "Install" wherever and in whatever manner used shall mean the installation, complete in place of an item.
- w) Notice of Award - The written notice of the acceptance of the Bid from the OWNER to the successful Bidder.
- x) Notice to Proceed - Written communication issued by the OWNER to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.
- y) Or Equal - The terms "or equal" or "approved equal" shall be understood to indicate that the "equal" product be the same or better than the product named in function, performance, reliability, quality and general configuration. Determination of equality in reference to the project design requirement will be made by the Owner's Representative .
- z) OWNER – The Del Norte County Service Area No. 1
- aa) Owner's Representative – The authorized representative of the OWNER who is assigned to the project site or any part of thereof.

- bb) Plans or Specification Plans - The term "Plans" refer to the official Plans, profiles, cross sections, elevations, details, and other working Plans and supplementary Plans, or reproductions thereof, signed by the Engineer, which show the location, character, dimensions, and details of the Work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.
- cc) Provide - "Provide" wherever and in whatever manner used shall be understood to mean furnish and install.
- dd) Project Geotechnical Engineer – Authorized representative of the Engineer who is assigned to the Project or any part thereof.
- ee) Resident Project Representative - Authorized representative of the Engineer who is assigned to the Project or any part thereof.
- ff) Service of Notice - Any notice from one party to the other under the Contract shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative thereof. Any such notice shall not be effective for any purpose whatsoever unless service in the following manner:
- (i) If the notice is given to the OWNER by personal delivery thereof, the OWNER'S Project Representative or by depositing the notice in the U.S. mail, enclosed in a sealed envelope addressed to Del Norte County, Attn: County Engineer, 981 H Street, Suite 110, Crescent City CA, 95531, postage prepaid, by certified mail return receipt requested And with a copy to: Del Norte County, Attn: County Counsel, 981 H Street, Suite 220, Crescent City, CA, 95531.
  - (ii) If the notice is given to the Contractor, by personal delivery to the Contractor or its duly authorized representative at the project site or by depositing in the U.S. mail, enclosed in a sealed envelope address to the Contractor on the Contract Form, postage prepaid, by certified mail, return receipt request.
  - (iii) If the notice is given to the surety or any other person, by personal delivery to such surety or other person by personal delivery to such surety or other person by depositing in the U.S. mail, enclosed in a sealed envelope, addressed to the surety or other person at the address of such surety or other person last communicated to the party giving the notice, postage prepaid, by certified mail return receipt requested.
- gg) Shall or Will - "Shall," or "Will," whenever used to stipulate anything, means shall or will be done or be performed by either the Contractor or the OWNER and means that the Contractor or the OWNER has thereby entered into a covenant with the other party to do or perform the same.
- hh) Shop Drawing - All Plans, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.
- ii) Shown - "Shown," "indicated," "detailed," and words of like import, wherever and in whatever manner used, with or without reference to the Plans, means shown, indicated or detailed on the Plans.
- jj) Specifications - A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship, including the General Conditions and Supplemental General Conditions.
- kk) Specified - "Specified," "described," or "noted," wherever and in whatever manner used, means as specified, described or noted in the Contract Documents.
- ll) State – Any State Agency, as applicable.

- mm) Subcontractors - The term "Subcontractor", as employed herein, includes only those having a direct contract with the Contractor and it includes one who furnishes material worked to a special design according to the Plans or Specifications of this Work, but does not include one who merely furnishes material not so worked and would be considered a supplier only.
- nn) Substantial Completion - That date as certified by the Owner's Representative when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it is intended.
- The Owner's Representative may, at its sole discretion, issue a written notice of substantial completion for the purpose of establishing the starting date for specific equipment guarantees, and to establish the date that the OWNER will assume the responsibility for the cost of operating such equipment. Said notice shall not be considered as final acceptance of any portion of the Work or relieve the Contractor from completing the remaining Work within the specified time and in full compliance with the Contract Documents.
- oo) Sufficient - "Sufficient," "necessary," or "proper," "acceptable," "satisfactory," "desirable," and words of like import, wherever and in whatever manner used, with or without reference to the Owner's Representative, means sufficient, necessary, proper, acceptable, satisfactory and desirable in the judgment of the Owner's Representative.
- pp) Supplementary Conditions - Modifications to General Conditions required by a Federal Agency for participation in the PROJECT and approved by the Agency in writing prior to inclusion in the Contract Documents, or such requirements that may be imposed by applicable State laws.
- References to "Supplemental General Conditions" in the General Conditions and elsewhere in the Contract Documents shall be construed to read "Supplementary Conditions."
- qq) Supplier - Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.
- rr) Time Limits - All time limits stated in the Contract Documents are of the essence of the Contract.
- ss) Work - All the Work specified, indicated, shown or contemplated in the Contract to construct the improvements, including all alterations, amendments or extensions thereto made by Contract Change Order or other written orders of the Owner's Representative.
- tt) Written Notice - "Written Notice" shall be deemed to have been duly served when delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended or if delivered at or sent by registered mail to the last business address known to it who gives the notice.
- uu) Whenever in the Specifications or upon the Plans the words DIRECTED, REQUIRED, PERMITTED, ORDERED, DESIGNATED, PRESCRIBED, or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the Engineer is intended, and similarly the words APPROVED, ACCEPTABLE, SATISFACTORY, or words of like import, shall mean approved or acceptable to, or satisfactory to the Owner's Representative, unless otherwise expressly stated.

## **SECTION B GENERAL CONDITIONS**

### ARTICLE I. SCOPE OF WORK

#### B-1 Intent of Contract Documents

The intent of the Contract Documents is to prescribe the details for the construction and completion of the Work which the Contractor undertakes to perform in accordance with the terms of the Contract. Where the Specifications and Plans describe portions of the Work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment and incidentals and do all the Work involved in performing the Contract in a satisfactory and workmanlike manner, ready for use occupancy or operation by the OWNER.

The technical provisions are presented in sections for convenience. However, this presentation does not necessarily delineate trades or limits of responsibility. All sections of the Specifications and Plans are interdependent and applicable to the project as a whole.

The Contract Documents are complementary, and what is called for in any one shall be as binding as if called for in all.

Anything shown on the Plans and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Plans shall have the same effect as if shown or mentioned respectively in both. Any Work shown on one drawing shall be construed to be shown in all Plans and the Contractor will coordinate the Work and the Plans. If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence: The OWNER-Contractor Contract; the Bid; any Supplementary or Special Conditions; Instructions to Bidders; the General Conditions; the Specifications; the Plans. Technical Specifications take priority over general Specifications and detail Plans take precedence over general Plans. As between schedules and information given on Plans, the Schedules shall govern. As between figures given on Plans and the scales measurements, the figures shall govern. As between large-scale Plans and small-scale Plans, the larger scale shall govern. Any conflict or inconsistency between or in the Plans shall be submitted to the Engineer through the Owner's Representative in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's own risk.

#### B-2 Contractor's Understanding

It is understood and agreed that the Contractor has, by careful examination, satisfied itself as to the nature and location of the Work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. No verbal agreement or conversation with any officer, agent or employee of the OWNER, either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

#### B-3 Changes in the Work

The OWNER may, at any time, by written order make changes in the Work including but not limited to: (a) changes in the Specifications on Plans; (b) changes in the sequence, method or manner of performance of the Work; (c) changes in the owner-furnished facilities, equipment, materials, services or site; or (d) changes directing acceleration of the Work. If such changes cause an increase or decrease in the Contractor's cost of, or time required for, performance of the Contract an equitable adjustment will be made and the Contract modified in writing accordingly. Any Contract Change Orders which increase the project cost will require prior approval from the project funders, before the Contract Change Order work is initiated. The Owner's Representative will coordinate change order approval.

Such modification will be in the form of a Contract Change Order which will set forth the Work to be done or the method by which the change and cost adjustment, if any, will be determined, and the time of completion of the Work.

The compensation to be paid for any extra Work or change shall be determined in one or more of the following ways or at OWNER's sole election:

- a) By unit prices previously approved (unit prices previously approved shall be used in all cases for similar units unless mutually agreed that for some reason they are not applicable);
- b) By estimate and acceptance of an agreed upon lump sum; or
- c) On a time and materials basis involving the actual necessary expenses and other services necessary to complete the Work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual necessary expense to cover the cost of general overhead, general superintendence, other expenses and profit. In the events that items (a) and (b) above are not applicable, then this latter method (c) shall be used. Markup by Subcontractors on their Work shall not exceed fifteen percent. Contractor's markup on Subcontractor's Work shall not exceed five (5) percent.

The Contractor shall keep full and complete records of the actual cost of such Work in the form and manner prescribed by the Owner's Representative and shall permit the Owner's Representative to have access to such records as may be necessary to assist in the determination of the compensation payable for such Work.

The Owner's Representative also may at any time by issuing a Field Order make changes in the details of the Work. The Contractor shall proceed with the performance of any change in the Work so ordered by the Owner's Representative unless the Contractor believes that such Field Order entitles it to a change in the Contract Price or Time, or both in which event the Contractor shall give the Owner's Representative written notice thereof within seven (7) calendar days after the receipt of the ordered change. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instruction from the OWNER.

If the Contractor is delayed in completing by reason of any change made pursuant to this section, the time for completion of the Work shall be extended by Change Order for a period agreed to, commensurate with such delay. The Contractor shall not be subjected to any claim for liquidated damages for this period of time, but the Contractor shall have no claim for any other compensation for any such delay.

#### B-4 Procedures and Allowable Costs on Changes

- a) All changes which affect the cost or time of the construction of the project must be authorized by means of a Change Order. The Change Order will include extra Work, Work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the Bidding Schedule because of final measurements. All changes should be recorded on a Change Order as they occur. Each Change Order must contain complete and detailed justification for all items addressed by the Change Order.
- b) If the change in or addition to the Work will result in an increase in the contract sum, the OWNER shall have the right to require the performance thereof in any of the following ways, at OWNER's sole election:
  - (i) By unit prices previously approved (unit prices previously approved shall be used in all cases for similar units unless mutually agreed that for some reason they are not applicable);
  - (ii) By estimate and acceptance of an agreed upon lump sum; or
  - (iii) On a time and materials basis involving the actual necessary expenses and other services

necessary to complete the Work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual necessary expense to cover the cost of general overhead, general superintendence, other expenses and profit. In the events that items (a) and (b) above are not applicable, then this latter method (c) shall be used. Markup by Subcontractors on their Work shall not exceed fifteen percent. Contractor's markup on Subcontractor's Work shall not exceed five percent (5%).

- c) If the OWNER elects to have the Change in the Work performed on a lump sum basis, such election shall be based on a lump sum proposal which shall be submitted by the Contractor within ten (10) calendar days of the OWNER's request therefor. Request for a lump sum proposal shall not be deemed an election to have the Work performed on a lump sum basis. The Contractor's proposal shall be itemized and segregated by labor and materials for the various components of the change (no aggregate labor total will be acceptable) and shall be accompanied by signed proposals of any Subcontractors which will perform any portion of the change, and of any persons who will furnish materials or equipment for incorporation therein. The proposal shall also include the Contractor's estimate of the time required to perform said changes or additional Work.

The portion of the proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include reasonably anticipated gross wages of Job Site labor, including foremen, who will be directly involved in the Change in the Work (for such time as they will be so involved), plus payroll costs (including premium costs of overtime labor, if overtime is anticipated, social security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor) and up to fifteen percent (15%) of such anticipated gross wages, but not payroll costs, as overhead and profit for the Contractor or any such Subcontractor, as applicable (such overhead and profit to include all supervision except foremen.)

The portion of the proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the Change in the Work, plus transportation and applicable sales or use taxes and up to fifteen percent (15%) of such anticipated gross wages, but not payroll costs, as overhead and profit for the Contractor or any such Subcontractor, as applicable (such overhead and profit to include all supervision except foremen.)

The portion of the proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the Change in the Work, plus transportation and applicable sales or use taxes and up to fifteen percent (15%) of said direct material costs as overhead and profit for the Contractor or any such Subcontractor (such overhead and profit to include all small tools), and may further include the Contractor's and any of its Subcontractors' reasonably anticipated rental costs in connection with the Change in the Work (either actual rates or discounted local published rates), plus up to five percent (5%) thereof as overhead and profit for the Contractor or any such Subcontractors, as applicable. If any of the items included in the lump sum proposal are covered by unit prices contained in the Contract Document, the OWNER may, if it requires the Change in the Work to be performed on a lump sum basis, elect to use these unit prices in lieu of the similar items included in the lump sum proposal in which event and appropriate deduction will be made in lump sum amount prior to the application of any allowed overhead and profit percentages. No overhead and profit shall be applied to any unit prices.

The lump sum proposal may include up to five percent (5%) of the amount which the Contractor will pay to any of its Subcontractors for the Change in the Work as a commission to the Contractor.

- d) In the event that the Contractor fails to submit its proposal within the designated period, the Owner's Representative may direct the Contractor to proceed with the Change or Addition to the Work and the Contractor shall so proceed. The Owner's Representative shall determine the reasonable costs and time to perform the Work in question, which determination when approved

by OWNER shall be final and binding upon the Contractor.

- e) In the event that the parties are unable to agree as to the reasonable costs and time to perform the change in or addition to the Work based upon the Contractor's proposal and the Owner's Representative and OWNER do not elect to have the change in the Work performed on a time and material basis, the Owner's Representative and OWNER shall make a determination of the reasonable cost and time to perform the change in the Work, based upon their own estimates, the Contractor's submission or combination thereof. A Change Order shall be issued for the amount of costs and time determined by the Owner's Representative and the OWNER and shall become binding upon the Contractor unless the Contractor submits its protest in writing to the OWNER within thirty (30) calendar days of the issuance of the Change Order. The OWNER has the right to direct the Contractor in writing to perform the Change in the Work which is the subject of the Change Order. Failure of the parties to reach agreement regarding the costs and time of the performing the Change in the Work and/or any pending protest shall not relieve the Contractor from performing the Change in the Work promptly and expeditiously.
- f) If the OWNER elects to have the Change in the Work performed on a time and material basis, the same shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors or Sub-subcontractors, at actual costs to the entity or entities performing the Change in the Work (without any charge for administration, clerical expense, supervision or superintendence of any nature whatsoever, including foremen, or the costs, use or rental of tools or plant), plus fifteen percent (15%) thereof as the total overhead and profit to the entity or entities actually performing the change (except that this fifteen percent (15%) shall not be applied against any payroll costs, defined herein with respect to lump sum proposals). If the entity or entities actually performing the work are Subcontractors or Sub-subcontractors, the Contractor shall be allowed five percent (5%) of the total charge of the performing entity or entities (including mark-up) as Contractor's mark-up. No other mark-ups shall be allowed hereunder. The Contractor shall submit to the OWNER daily work and material tickets, to include the identification number assigned to the Change in the Work, the location and description of the Change in the Work, the classification of labor employed (and names and social security numbers), the material used, the equipment rented (not tools) and such other evidence of cost as the OWNER may require. The OWNER may require authentication of all time and material tickets and invoices by persons designated by the OWNER for such purpose. The failure of the Contractor to secure any required authentication shall, if the OWNER elects to treat it as such, constitute a waiver by the Contractor of any claim for the cost of that portion of the Change in the Work covered by a non-authenticated ticket or invoice; provided, however, that the authentication of any such ticket or invoice by the OWNER shall not constitute an acknowledgment by the OWNER that the items thereon were reasonably required for the Change in the Work.
- g) No overhead and profit will be paid by the OWNER on account of a Change in the Work except as specifically provided in this Section B-4. Overhead and Profit, as allowed under this paragraph, shall be deemed to include all costs and expenses which the Contractor or any of its Subcontractors may incur in the performance of the Change in the Work and which are not otherwise specifically recoverable by them pursuant to this paragraph.
- h) The Contractor shall not be entitled to any amount for indirect costs, damages or expenses of any nature, including, but not limited to, so-called "impact" costs, labor inefficiency, wage, material or other escalations beyond the prices upon which the proposal is based and to which the parties have agreed pursuant to the provisions of this section, and which the Contractor, its Subcontractors and Sub-subcontractors or any other person may incur as a result of delays, interferences, suspensions, changes in sequence or the like, for whatever cause, whether reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, arising from the performance of any and all changes in the work performed pursuant to this section. It is understood and agreed that the Contractor's sole and exclusive remedy in such event shall be recovery of its direct costs as compensable hereunder and an extension of the time of the Contract, but only in accordance with the provisions of the Contract Documents.

The Contractor agrees that it shall not be entitled to claim damages for anticipated profits on any portion of Work that may be deleted. The amount of any adjustment for Work deleted shall be estimated at the time deletion of Work is ordered and the estimated adjustment will be deducted for the subsequent monthly pay estimates.

The OWNER reserves the right to contract with any person or firm other than the Contractor for any or all extra Work.

#### B-5 Unilateral Change in or Addition to the Work

Notwithstanding the above, the OWNER, directly or through the Owner's Representative, may direct the Contractor in writing to perform changes in or additions to the scope of the Contract. The Contractor shall perform such Work and the parties shall proceed pursuant to the provisions of Section B-4.

#### B-6 Differing Site Conditions

The Contractor shall promptly, and before the following conditions are disturbed, notify the OWNER in writing of any:

- a) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25118 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; or
- b) Subsurface or latent physical conditions at the site differing from those indicated in the Contract Documents; or
- c) Unknown conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Owner's Representative shall thereupon promptly investigate the conditions. If the Owner's Representative finds that they do involve hazardous waste, or do materially differ and cause any decrease or increase in the Contractor's cost or time of performance, it will issue a Change Order as appropriate. Any increase or decrease in the cost of the Work or the time for performance shall be adjusted in the manner provided herein for adjustments as to extra and/or additional Work and changes. The procedures applicable to claims per extra costs shall then apply.

In accordance with 36 CFR Part 800, in the event a potential historic property or cultural resource is discovered during construction activities, the Contractor must cease work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the discovered property/resource. Construction activities in the area of the discovery shall not resume until written notification obtained from the Owner's Representative.

#### B-7 Claims for Extra Costs

- a) The Plans for Work show the conditions as they are supposed or believed by the Owner's Representative to exist, but it is neither intended nor to be inferred that the conditions as shown thereon constitute a representation by the OWNER or its officers that such conditions are universally existent nor shall the OWNER or any of its officers or representatives be liable for any loss sustained by the Contractor as a result of any variance between conditions as shown on the Plans and alternate conditions revealed during the progress of the Work, or otherwise.
- b) The OWNER assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefor is assumed by the OWNER.
- c) It is hereby mutually agreed that the Contractor shall not be entitled to the payment of any

additional compensation for any cause, including any act, or failure to act, by the Owner's Representative or the OWNER, or the happening of any event, thing or occurrence, unless the Contractor shall have given the Owner's Representative due written notice of potential claims as hereinafter specified.

- d) The written notice of potential claims shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. Except as provided in Section B-6, the notice as above required shall be given to the Owner's Representative at least 48 hours prior to the time that the Contractor commences performance of the Work giving rise to the potential claim for additional compensation. If such notice is not given, the Contractor shall be barred from making any such claim for extra compensation.
- e) The Contractor may submit a claim to the Owner's Representative concerning any matter for which a protest under Section B-3 or a notice of potential claim is filed within sixty (60) calendar days following the submission of said protest or notice, unless, due to the nature of the claim or the uncompleted state of the Work, it is impracticable to determine the amount or the extent of the claim within such period, in which case a claim may be submitted at the earliest time thereafter that such determination can be made, but in no event later than the final release by the Contractor provided for in Section B-71. The claims shall set forth clearly and in detail, for each item of additional compensation claimed, the reasons for the claim, reference to applicable provisions of the Specifications, the nature and the amount of the cost involved, the computations used in determining such costs, and all pertinent factual data. The Contractor shall maintain complete and accurate records of the cost or any portion of the Work for which additional compensation is claimed, and shall provide the Owner's Representative with copies thereof, as required.
- f) The Owner's Representative will, within a reasonable time after submission of the Contractor's claim, make decisions in writing on all claims of the Contractor. All such decisions of the Owner's Representative shall be final unless the Contractor shall within ten (10) calendar days after receipt of the Owner's Representative decision, file with the Owner's Representative a written protest, stating clearly and in detail the basis thereof. Such protest will be forwarded promptly by the Owner's Representative to the OWNER, which will issue a decision upon each such protest, and the OWNER's decision will be final. Pending such decision, the Contractor shall proceed with its work in accordance with the determination or instructions of the Owner's Representative. It is hereby agreed that the Contractor's failure to protest the Owner's Representative determination or instructions, within ten (10) calendar days from and after the Owner's Representative determinations or instructions, shall constitute a waiver by the Contractor of all its rights to further protest, judicial or otherwise.
- g) It is the intention of this Section that the differences between the parties, arising under and by virtue of the Contract, be brought to the attention of the Owner's Representative at the earliest possible time in order that such matters may be settled, if possible or other appropriate action promptly taken. The Contractor hereby agrees that it shall have no right to additional compensation for any claim that may be based on any act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was timely filed.
- h) In the event of an emergency endangering life or property, the Contractor shall act as stated in Section B-62 herein, and after execution of the emergency work shall present an accounting of labor, materials and equipment in connection therewith. The procedure for any payment that may be due for emergency work will be as specified in Section B-3 herein.

#### B-8 Disputes

Except as otherwise specifically provided in the Contract Documents, the Owner's Representative will initially decide all claims of the Contractor and all disputes arising under and by virtue of the Contract. Such claim or dispute will be processed and decided by the Owner's Representative as soon as

practicable after its submission and the submission or availability of any additional information necessary to its decision. If the Contractor is dissatisfied with the Owner's Representative decision, the Contractor may, within fifteen (15) calendar days from the date of the Owner's Representative decision, follow the procedures set forth in Section B-55. If the Contractor fails to follow the procedures set forth in Section B-55 within the fifteen (15) calendar day period, then the Owner's Representative decision shall be final, conclusive and binding on the Contractor

**B-9 Guarantee**

- a) In addition to warranties, representations and guarantees stated elsewhere in the Contract Documents, the Contractor unconditionally guarantees all materials and workmanship furnished hereunder, and agrees to replace at its sole cost and expense, and to the satisfaction of the Owner's Representative and the OWNER, any and all materials which may be defective or improperly installed.
- b) The Contractor shall repair or replace to the satisfaction of the Owner's Representative any or all such work that may prove defective in workmanship or materials, ordinary wear and tear excepted, together with any other work which may be damaged or displaced in so doing.
- c) In the event of failure to comply with the above stated conditions within a reasonable time, the OWNER is authorized to have the defect repaired and made good at the expense of the Contractor who will pay the costs and charges therefor immediately upon demand, including any reasonable management and administrative costs, and engineering, legal and other consultant fees incurred to enforce this section.
- d) The signing of the Contract by the Contractor shall constitute execution of the above guarantees. Except as otherwise provided in this Contract, the guarantees and warranties shall remain in effect through the one-year maintenance warranty period specified in the Faithful Performance Bond and the warranty period and as specifically stated in other sections of these contract documents.

ARTICLE II. CONTROL OF WORK

B-10 Authority of the Owner's Representative

a) The Owner's Representative is the representative of the OWNER and has full authority to interpret the Contract Documents, to conduct the construction review and inspection of the Contractor's performance, and to decide questions which arise during the course of the work and its decisions on these matters shall be final and conclusive. The Owner's Representative has the authority to reject all work and materials which do not conform to the Contract Documents, and has the authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract.

If at any time the Contractor's work force, tools, plant or equipment appear to the Owner's Representative to be insufficient or inappropriate to secure the required quality of work or the proper rate of progress, the Owner's Representative may order the Contractor to increase their efficiency, improve their character, to augment their number or to substitute other personnel, new tools, plant or equipment, as the case may be, and the Contractor shall comply with such order.

b) Neither the failure of the Owner's Representative to demand such increase of efficiency, number, or improvement, nor the compliance by the Contractor with the demand, shall relieve the Contractor of its obligation to provide quality work at the rate of progress necessary to complete the Work within the specified time.

c) The Owner's Representative shall have the authority to make minor changes in the Work, not involving extra costs, and not inconsistent with the purposes of the Work.

d) Any order given by the Owner's Representative, not otherwise required by the Contract Documents to be in writing shall, on request of the Contractor, be given or confirmed by the Owner's Representative in writing.

e) Whenever work, methods of procedure, or any other matters are made subject to direction or approval, such direction or approval will be given by the Owner's Representative.

f) The Owner's Representative shall not be responsible for the construction means, controls techniques, sequences procedures or construction safety.

g) It is expressly agreed and understood that GHD Inc. will have no liability whatsoever resulting from the obligations entered into under the Contract except as provided in any scope of work agreement between GHD Inc. and the OWNER; that the OWNER must look solely to the Contractor for the furnishing of the Work; that the Contractor must look solely to the OWNER for payment; and that the OWNER and the Contractor must look solely to each other for the enforcement of any claims or liabilities arising under or by reason of the Contract.

B-11 Plans

a) Plans furnished herewith are for bidding purposes. The Contractor shall maintain on the job site and make available to the Owner's Representative on request, one current full-sized marked-up set of design Plans which accurately indicate all variations in the completed Work that differ from the design information shown on the Plans. If the Contractor, in the course of the Work, finds any discrepancy between the Plans and the physical condition of the locality, or any errors or omissions in the Plans, or in the layout as given by points and instructions, it shall be the Contractor's duty to inform the Owner's Representative in writing, and the Owner's Representative will promptly verify the same. Any Work done after such discovery, until authorized, will be done at the Contractor's risk. The Contractor may be furnished additional instructions and detail Plans by the Owner's Representative as necessary to carry out the Work required by the Contract Documents.

The additional Plans and instructions thus supplied, will become part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail Plans and instructions.

- b) The Plans shall be supplemented by such Shop Drawings prepared by the Contractor as are necessary to adequately control the Work. No changes shall be made by the Contractor in any Shop Drawings after they have been reviewed by the Owner's Representative.
- c) Shop Drawings for any structure shall include, but not be limited to: stress sheets, anchor bolt layouts, shop details, and erection plans, which shall be reviewed and accepted by the Owner's Representative before any such work is performed.
- d) Contractor agrees that Shop Drawings processed by the Owner's Representative are not Contract Change Orders; that the purpose of Shop Drawings submitted by the Contractor is to demonstrate to the Owner's Representative that the Contractor understands the design concept, that it demonstrates its understanding by indicating which equipment and material it intends to furnish and by detailing the fabrication methods it intends to use.
- e) It is expressly understood, however, that favorable review of the Contractor's Shop Drawings shall not relieve the Contractor of any responsibility for accuracy of dimensions and details, or for mutual agreements of dimensions and details. It is mutually agreed that the Contractor shall be responsible for agreement and conformity of its Shop Drawings with the Specifications. Contractor further agrees that if deviations, discrepancies or conflicts between Shop Drawings and Specifications are discovered either prior to or after Shop Drawings are processed by the Owner's Representative, the Specifications shall control and shall be followed.
- f) Unless otherwise stated, the Owner's Representative shall have thirty (30) calendar days from the date of receipt of Shop Drawings for review.
- g) Full compensation for furnishing all Shop Drawings shall be considered as included in the prices paid for the Contract items of Work to which such Drawings relate and no additional compensation will be allowed therefor. Any cost related to the Owner's Representative's review of any particular set of Shop Drawings more than twice, due to incompleteness or unacceptability, shall be borne by the Contractor, and the OWNER reserves the right to withhold such costs from payments due the Contractor.
- h) When submitted for the Owner's Representative review, Shop Drawings shall bear the Contractor's certification that he has reviewed, checked and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents.
- i) That Portion of the Work requiring a Shop Drawing or sample submission shall not begin until the Shop Drawing or submission has been approved by the Owner's Representative. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Owner's Representative.
- j) Acceptance by the Owner's Representative of any drawing, method of work, or any information regarding materials and equipment the Contractor proposes to furnish shall not relieve the Contractor of his responsibility for any errors therein and shall not be regarded as an assumption of risks or liability by the Owner's Representative or OWNER, or any officer or employee thereof, and the Contractor shall have no claim under the Contract on account of the failure or partial failure or inefficiency or insufficiency of any plan or method or work or material and equipment so accepted. Such acceptance shall be considered to mean merely that the Owner's Representative has no objection to the Contractor using, upon his own full responsibility, the plan or method of work proposed, or furnishing the materials and equipment proposed.

**B-12 Construction Staking and Surveys**

The Contractor shall furnish land surveys deemed necessary for locating the principal component parts of the Work.

**B-13 Permits and Regulations**

Permits, licenses, and easements of a temporary or permanent nature, necessary for the prosecution of the Work shall be secured and paid for by the Contractor, except as noted in Section B-32, and herein.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as shown on the Plans and described in the Specifications. It shall promptly notify the Owner's Representative in writing of any specification at variance therewith and any necessary changes shall be adjusted as provided in the Contract for changes in the Work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules, and regulations and without such notice to the Owner's Representative, it shall bear all costs arising therefrom.

**B-14 Conformity with Contract Documents and Allowable Deviations**

Work and materials shall conform to the lines, grades, cross sections, dimensions and material requirements, including tolerances, shown on Contract Documents. Although measurement, sampling, and testing may be considered evidence as to such conformity, the Owner's Representative shall be the sole judge as to whether the work or materials deviate from the Specifications and Plans, and its decision as to any allowable deviations therefrom shall be final and conclusive.

Whenever a material, article or piece of equipment is identified on the Plans or Specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Owner's Representative, such material, article, or piece of equipment is of equal substance and function to that specified, the Owner's Representative may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time.

**B-15 Coordination and Interpretation of Contract Documents**

- a) The Contract Documents are complementary and a requirement occurring in one is as binding as though occurring in all.
- b) In the event of conflict between the Plans and the Technical Specifications, the Technical Specifications shall govern, except that, where items are shown on the Plans and are not specifically included in the Technical Specifications, the Plans shall govern.
- c) Should it appear that the Work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Specifications and Plans, the Contractor shall apply to the Owner's Representative for such further explanations as may be necessary and shall conform to them as part of the Contract. In the event of any doubt or question arising respecting the true meaning of the Specifications and Plans, reference shall be made to the Owner's Representative, whose decision thereon shall be final and conclusive.
- d) In the event of any discrepancy between any Plans and the figures written thereon, the figures shall be taken as correct. Detailed Plans shall prevail over general Plans.

- e) Any reference made in these Specifications or on the Plans to any Specification, standard, method, or publication of any scientific or technical society or other organization shall, in the absence of a specific designation to the contrary, be understood to refer to the Specification, standard, method, or publication in effect as of the date that the Work is advertised for Bids.

**B-16**    Subcontracts

- a) The attention of the Contractor is directed to the provisions of Public Contract Code sections 4100-4113, regarding subcontracting and said provisions are by this reference incorporated herein and made a part hereof.
- b) Each Subcontract shall contain a suitable provision for the suspension or termination thereof should the Work be suspended or terminated or should the Subcontractor neglect or fail to conform to every provision of the Contract Documents insofar as such provisions are relevant. No Subcontractor or supplier will be recognized as such, and all persons engaged in work will be considered as employees of the Contractor, and the Contractor will be held responsible for their work, which shall be subject to the provisions of the Contract Documents. The Contractor shall be fully responsible to the OWNER for the acts or omissions of its Subcontractors and of the persons either directly or indirectly employed by him. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the OWNER. If a legal action, including arbitration and litigation, against the OWNER is initiated by a Subcontractor or Supplier, the Contractor shall reimburse the OWNER for the amount of legal, engineering and all other expenses incurred by the OWNER in defending itself in said action.
- c) The OWNER and the Owner's Representative reserve the right to approve all subcontractors. Such approval shall be a consideration to the awarding of the Contract and unless notification to the contrary is given to the Contractor prior to the signing of the Contract, the list of subcontractors which is submitted with its proposal will be deemed to be acceptable.

**B-17**    Cooperation of Contractors

- a) Should construction be under way by other forces or by other Contractors within or adjacent to the limits of the Work specified or should work of any other nature be under way by other forces within or adjacent to said limits, the Contractor shall cooperate with all such other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional Work at or near the site (including material sources) at any time, by the use of other forces.
- b) When two or more Contractors are employed on related or adjacent Work, each shall conduct its operation in such a manner as not to cause any unnecessary delay or hindrance to the other. Each Contractor shall be responsible to the other for all damage to Work, to persons or property caused to the other by its operations, and for loss caused the other due to its unnecessary delays or failure to finish the Work within the time specified for completion.

**B-18**    Superintendence

- a) The Contractor shall designate in writing before starting work an individual as authorized representative who shall have the authority to represent and act for the Contractor. This authorized representative shall be present at the site of the Work at all times while work is actually in progress on the Contract. When work is not in progress and during periods when work is suspended, arrangements acceptable to the Owner's Representative shall be made for any emergency work which may be required.
- b) The Contractor is solely responsible, at all times, for the superintendence of the Work and for its safety and progress.
- c) Whenever the Contractor or its authorized representative is not present on any particular part of

the Work where it may be desired to give direction, orders will be given by the Owner's Representative, which shall be received and obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given.

- d) Any order given by the Owner's Representative, not otherwise required by the Specifications to be in writing, will on request of the Contractor, be given or confirmed by the Owner's Representative in writing.

**B-19 Inspection of Work**

- a) Unless otherwise provided, all equipment, materials, and Work shall be subject to inspection and testing by the Owner's Representative and the State. The Owner's Representative will observe the progress and quality of the Work and determine, in general, if the Work is proceeding in accordance with the intent of the Contract Documents. It shall not be required to make comprehensive or continuous inspections to check the quality of the Work, and it shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work. Visits and observations made by the Owner's Representative shall not relieve the Contractor of its obligation to conduct comprehensive inspections of the Work and to furnish proper materials, labor, equipment and tools, and perform acceptable work, and to provide adequate safety precautions, in conformance with the intent of the Contract.
- b) Whenever the Contractor varies the period during which work is carried on each day, it shall give due notice to the Owner's Representative so that proper inspection may be provided. Any Work done in the absence of the Owner's Representative shall be subject to rejection. Proper facilities for safe access for inspection to all parts of the Work shall at all times be maintained for the necessary use of the Owner's Representative and other agents of the OWNER, and agents of the Federal, State, or local governments at all reasonable hours for inspection by such agencies to ascertain compliance with laws and regulations.
- c) One or more inspectors may be assigned to observe the Work and to act in matters of construction under this Contract. It is understood that inspectors shall have the power to issue instructions and make decisions within the limitations of the authority of the Owner's Representative. Such inspection shall not relieve the Contractor of its obligation to conduct comprehensive inspections of the Work, to furnish proper materials, labor, equipment and tools, and perform acceptable Work, and to provide adequate safety precautions in conformance with the intent of the Contract.
- d) The Owner's Representative and its Representatives, the OWNER and its Representative, and the State and its Representative shall at all times have access to the Work wherever it is in preparation or progress, and the Contractor shall provide safe and convenient facilities for such access and for inspection. If the Specifications, the Owner's Representative's instructions, laws, ordinances, or any public authority require any material, equipment or Work to be specifically tested or approved, the Contractor shall give the Owner's Representative timely notice of its readiness for inspection, and if the inspection is by an authority other than the OWNER, of the time fixed for inspection. Inspections by the Owner's Representative will be made promptly and, where practicable, at the source of supply.
- e) Work performed without inspection may be required to be removed and replaced under proper inspection and the entire cost of removal and replacing, including the cost of OWNER-furnished materials used in the Work, shall be borne by the Contractor, regardless of whether or not the Work exposed is found to be defective. Examination of questioned Work, other than that installed without inspection, may be ordered by the Owner's Representative and, if so ordered, the Work must be uncovered by Contractor. If such Work is found to be in accordance with the Contract Documents, the OWNER will pay the cost of re-examination and replacement. If such Work is found to be not in accordance with the Contract Documents, the Contractor shall pay such cost unless it can show that the defect in the Work was caused by another Contractor, and in that event the OWNER will pay such costs.

- f) The inspection of the Work shall not relieve the Contractor of its obligation to fulfill the Contract as herein prescribed, or in any way alter the standard of performance provided by the Contractor, and defective Work shall be made good and unusable materials may be rejected, notwithstanding that such Work and materials have been previously overlooked by the Owner's Representative and accepted or estimated for payment. If the Work or any part thereof shall be found defective, Contractor shall, within ten (10) calendar days, make good such defect in a manner satisfactory to the Owner's Representative . If the Contractor shall fail or neglect to make ordered repairs of defective Work or to remove the condemned materials from the Work within ten (10) calendar days after direction by the Owner's Representative in writing, the OWNER may make the ordered repairs, or remove the condemned materials, and deduct the cost thereof from any monies due the Contractor.
- g) The Contractor shall furnish promptly without additional charge all facilities, labor and materials reasonably needed by the Owner's Representative for performing all inspection and tests. Contractor shall be charged with any additional cost of inspection when material and workmanship are not ready at the time specified by the Contractor for its inspection.
- h) Where any part of the Work is being done under an encroachment permit or building permit, or is subject to Federal, State, County, or district codes, laws, ordinances, rules or regulations, representatives of the government agency shall have full access to the Work and shall be allowed to make any inspection or tests in accordance with such permits, codes, laws, ordinances, rules, or regulations. If advance notice of the readiness of the Work for inspection by the governing agency is required, the Contractor shall furnish such notice to the appropriate agency.
- i) The Owner's Representative may inspect the production of the material, or the manufacture of products at the source of supply. Plant inspection, however, will not be undertaken until the Owner's Representative is assured of the cooperation and assistance of both the Contractor and the material producer. The Owner's Representative or its authorized representative shall have free entry at all times to such parts of the plant as concerns the manufacture or production of the materials. Adequate facilities shall be furnished free of charge to make the necessary inspection. The OWNER assumes no obligation to inspect materials at the source of supply.
- j) Forty-eight (48) hours prior to Work being accomplished, the Contractor will notify the Owner's Representative of the proposed working hours to accomplish the Work for that day. Overtime and shift work may be established as a regular procedure by the Contract and with the written permission of the Owner's Representative . Such permission may be revoked at any time. No work other than overtime and shift work established as a regular procedure shall be done between the hours of 5 p.m. and 7 a.m. Monday through Friday, nor Saturdays or Sundays, or legal holidays, except such work as is necessary for the proper care and protection of the work already performed or except in case of an emergency.

All costs for the overtime inspection, including those occurring as a result of overtime and shift work established as a regular procedure, shall be paid for by the Contractor. Overtime inspection shall include inspection required during holidays, Saturdays, Sundays, and any weekday between the hours of 5 p.m and 7 a.m. Such costs will include, but will not necessarily be limited to, engineering, inspection, general supervision and other expenses which are directly chargeable to the overtime work. All such charges shall be deducted by the OWNER from payment due the Contractor.

- k) A prefinal inspection of the Work will be made by the OWNER and the Owner's Representative. This inspection shall be made as soon as practical after Contractor has notified the OWNER in writing that the Work is ready for this inspection. The prefinal inspection shall be made prior to acceptance of any portion of the Work as being substantially complete and prior to filing the Notice of Completion.

A final inspection of all the Work will be made by the OWNER, Owner's Representative, and Contractor.

B-20 Tests

The OWNER shall perform or witness all tests specified or required by the Technical Specifications. The responsibility for payment for these tests is also outlined in the Technical Specifications. The Owner's Representative will perform such tests as it deems necessary to determine the quality of Work or compliance with Contract Documents, which do not relieve the contractor of any required testing indicated in the plans or specifications. The Contractor shall furnish promptly without additional charge all facilities, labor, and material reasonably required for performing safe and convenient tests as may be required by the Owner's Representative. All tests by the Owner's Representative will be performed in such a manner as will not unnecessarily delay the Work. The Contractor shall not be required to reimburse the OWNER for tests performed by the OWNER or Owner's Representative. If samples of materials are submitted which fail to pass the specified tests, the Contractor shall pay for all subsequent tests.

B-21 Removal of Rejected and Unauthorized Work and Materials

- a) All work or materials which have been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed it for such removal, replacement, or remedial work.
- b) Any work done beyond the lines and grades shown on the Plans or established by the Owner's Representative or any extra work done without written authority will be considered as unauthorized work and will not be paid for. Upon order of the Owner's Representative, unauthorized work shall be remedied, removed, or replaced at the Contractor's expense.
- c) Upon failure of the Contractor to comply with any order of the Owner's Representative made under this Section, the OWNER may cause rejected or unauthorized work to be remedied, removed or replaced, and may deduct the costs therefor from any monies due or to become due the Contractor.
- d) If following the installation of any equipment furnished hereunder, defects requiring correction by the Contractor are found, the OWNER shall have the right to operate such unsatisfactory equipment and make reasonable use thereof until the equipment can be shut down for correction of defects without injury to the OWNERS.

B-22 Deductions for Uncorrected Work

If the Owner's Representative deems it inexpedient to correct Work damaged or not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefor, and such sum may be withheld by OWNER from Contractor's payment.

B-23 Equipment

- a) Only equipment suitable to produce the quality of work and materials required will be permitted to operate on the project.
- b) Work will be designed and constructed in accordance with general practice for such equipment and shall be of sufficient capacity to insure the production of sufficient material to carry the Work to completion within the time limit.
- c) The Contractor shall provide adequate and suitable equipment to meet the above requirements, and when ordered by the Owner's Representative, shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory plants.
- d) The Contractor shall identify each piece of its equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location, and shall furnish to the Owner's Representative a list giving the description of each piece of equipment and its identifying number. In addition, the make, model number and empty gross

weight of each unit of compacting equipment shall be plainly stamped or stenciled in a conspicuous place on the unit. The gross weight shall be either the manufacturer's rated weight or the scale weight.

- e) In the case of termination of this Contract before completion from any cause whatever, the Contractor, if notified to do so by the OWNER, shall promptly remove any part or all of its equipment and supplies from the property of the OWNER. If the Contractor fails to do so, the OWNER shall have the right to remove such equipment and supplies at the expense of the Contractor.

#### B-24 Character of Worker

The Contractor shall employ only competent subcontractors or skillful workers to do the Work. If any Subcontractor, or person employed by the Contractor or any Subcontractor shall fail or refuse to carry out the directions of the OWNER or its agents or shall appear to the OWNER or its agents to be incompetent or to act in a disorderly or improper manner, it shall be removed from the project Work immediately on the requisition of the OWNER or its agents, and such person shall not again be employed on the Work. Such discharge shall not be the basis for any claim for compensation or damages against the OWNER, or any of its officers or agents.

#### B-25 Separate Contracts

The OWNER reserves the right to let other contracts in connection with this Work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with the other contractor's work.

If any part of the Contractor's work depends on proper execution or results upon the work of any other contractor, the Contractor shall inspect and promptly report to the Owner's Representative any defects in such work that render it unsuitable for such proper execution and results. The Contractor's failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of its work, except as to defects which may develop in the other contractor's work after the execution of its work.

To insure the proper execution of its subsequent work, the Contractor shall measure work already in place and shall at once report to the Owner's Representative any discrepancy between the executed work and the Plans.

The OWNER may perform additional Work related to the Project by himself, or he may let other Contracts containing provisions similar to these. The Contractor will afford the other Contractors who are parties to such Contracts (or the OWNER, if he is performing the additional Work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate his Work with theirs.

If the performance of additional Work by other Contractors or the OWNER is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional Work. If the Contractor believes that the performance of such additional Work by the OWNER or others involves him in additional expense or entitles him to an extension of the Contract Time, he may make a claim therefore as provided in Section B-7 of this Contract.

#### B-26 Materials, Services and Facilities

- a) Unless otherwise specifically stated in the Contract Documents, the Contractor shall furnish all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature on all of the facilities necessary for the execution and completion of the Work. Unless otherwise specified, all materials shall be new and shall be manufactured, handled,

and installed in a workmanlike manner to insure completion of the Work in accordance with the Contract Documents. The Contractor shall, upon request of the Owner's Representative, furnish satisfactory evidence as to the kind and quality of materials.

- b) Where materials are to be furnished by the OWNER, the type, size, quantity and location at which they are available will be stated in the Contract Documents.
- c) Manufacturers' warranties, guarantees, instruction sheets and parts listed, which are furnished with certain articles or materials incorporated in the Work, shall be delivered to the Owner's Representative before acceptance of the Contract.
- d) Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.
- e) Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Owner's Representative.
- f) Materials, supplies or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.
- g) The completed Work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items required by the State and Federal (OSHA) industrial safety authorities and applicable local and national codes. Further, any features of the Work subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. Prior to performing Work specified herein, the Contractor shall request an inspections as required for the purpose of determining that the facilities provided are in compliance with the State and Federal safety requirements. Any facilities which are deemed necessary by official response following the above safety inspection shall be added or corrected as required as a part of the Contract Work. However, no payment will be made to the Contractor for such changes or additions to equipment furnished under this Contract since it is a requirement of these Specifications that such equipment be manufactured or fabricated in such a manner as to be in conformance with all Federal, State, and local safety requirements. The Contractor shall notify all manufacturers, equipment suppliers, and Subcontractors of the provisions of this article.
- h) In approving equipment for installation in the project, the OWNER and Owner's Representative assume no responsibility for injury or claims resulting from failure of the equipment to comply with applicable National, State, and local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials.
- i) All materials incorporated into the job shall be new, especially purchased for the project unless otherwise specified or agreed in writing. Unless otherwise noted, any equipment offered shall be current modifications which have been in successful regular operation under comparable conditions for a period sufficient to determine the reliability of the product. This time requirement, however, does not apply to minor details nor to thoroughly demonstrated improvements in design or in materials of construction.
- j) Whenever the Contractor shall furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable in the market from firms of established good reputation, or, if not ordinarily carried in stock, shall conform to the usual standards of first-class materials or articles of the kind required with due consideration of the use to which they are to be put. In general, the work performed shall be in full conformity and harmony with the intent to secure the best standard of construction and equipment of the Work as a whole or in part.
- k) If there is a residual inventory of unused supplies exceeding \$5,000 in total fair market value upon

completion of the project, and if the supplies are not needed for any other state sponsored programs or projects, the Contractor shall notify the OWNER and provide unused supplies to the location and at the time arranged, for unloading and storage. The OWNER shall compensate the awarded agency for its share (44 CFR Section 13.33).

#### B-27 Storage of Materials

Materials shall be so stored as to ensure the preservation of their quality and fitness for the Work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and they shall be placed under cover. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the owner or lessee.

Electrical equipment, devices, and motors shall be placed in dry and warm storage as approved by the Owner's Representative.

All equipment and materials which are not to be painted (such as aluminum and stainless steel) and all factory finished or coated equipment and materials which are not to be painted, that are installed prior to completion of adjacent work, shall be completely covered and protected.

Articles or materials to be incorporated in the Work shall be stored in such a manner as to insure the preservation of their quality and fitness for the Work, and to facilitate inspection.

#### B-28 Trade Names and Alternatives

For convenience in designation in the Specifications and Plans, certain articles or materials to be incorporated in the Work may be designated under a trade name or the name of a manufacturer and its catalog information. The use of an alternative article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

- a) The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor and it shall furnish all information necessary as required by the Owner's Representative. The Owner's Representative shall be the sole judge as to the quality and suitability of alternative articles or materials and its decision shall be final.
- b) Whenever the Specifications and Plans permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of such substitute material or article will be made until the request for substitution is made in writing by the Contractor accompanied by complete data as to the equality of the material or article proposed. Such request by the Contractor must be made within thirty-five (35) calendar days after award of Contract.

#### B-29 Certificate of Compliance

- a) A Certificate of Compliance shall be furnished prior to the use of any materials for which the Technical Specifications require that such a certificate be furnished. In addition, when so authorized in the Specifications, the Owner's Representative may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance. 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 Contract. 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.
- b) 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 Contract Documents and any such material not conforming to such

requirements will be subject to rejection whether in place or not.

- c) The OWNER reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance.
- d) The form of the Certificate of Compliance and its disposition shall be as directed by the Owner's Representative.

**B-30 Assignment**

The Contractor shall not assign the Contract or sublet it as a whole or in part without the prior written consent of the OWNER, nor shall the Contractor assign any monies due, or to become due to it hereafter, without the prior written consent of the OWNER.

**B-31 Use of Completed Portions, Right to Operate Unsatisfactory Equipment or Facilities**

- a) The OWNER may, at any time, and from time to time, during the performance of the Work, enter the work site for the purpose of installing any necessary work by the OWNER labor or other contracts, and for any other purpose in connection with the installation of facilities. In doing so, the OWNER shall endeavor not to interfere with the Contractor and the Contractor shall not interfere with other work being done by or on behalf of the OWNER.
- b) If, prior to completion and final acceptance of all the Work, the OWNER takes possession of any structure or facility (whether completed or otherwise) comprising a portion of the Work with the intent to retain possession thereof (as distinguished from temporary possession contemplating the return to the Contractor), then, while the OWNER is in possession of the same, the Contractor shall be relieved of liability for loss or damage to such structure other than that resulting from the Contractor's fault or negligence. Such taking of possession by the OWNER shall not relieve the Contractor from any provisions of this Contract respecting such structure, other than to the extent specified in the preceding sentence, nor constitute a final acceptance of such structure or facility.
- c) If, following installation of any equipment or facilities furnished by the Contractor, defects requiring correction by the Contractor are found, the OWNER shall have the right to operate such unsatisfactory equipment or facilities and make reasonable use thereof until the equipment or facilities can be shut down for correction of defects without injury to the OWNER.

**B-32 Lands for Work, Right-of-Way Construction Roads**

- a) The OWNER will provide the lands, easements, rights-of-way, and/or encroachment permits necessary or other rights to enter and work on lands necessary for the performance of the Work. Other permits and licenses are addressed by sections B-13 and B-49. Should the Contractor find it advantageous to use any additional land for any purpose whatever, the Contractor shall provide for the use of such land at its expense. The Owner's Representative shall be furnished with a copy of written agreements or otherwise be notified in writing of additional working space which is acquired. Nothing herein contained and nothing marked on the Plans shall be interpreted as giving the Contractor exclusive occupancy of the territory provided by the OWNER. When two or more contracts are being executed at one time on the same or adjacent land in such a manner that work on one contract may interfere with that on another, the Owner's Representative shall decide which contractor shall cease work, and which shall continue, or whether the work on both contracts shall progress at the same time and in what manner, and the decision of the Owner's Representative shall be final and binding. When the territory of one contract is the necessary or convenient means of access for the performance of another contract, such privilege of access or any other reasonable privilege may be granted by the Owner's Representative to the Contractor so desiring, to the extent, amount, in the manner, and at the time permitted. No such decision as to the method or time of conducting the Work or the use of territory shall be the basis of any claim for delay or damage.

- b) Lands, easements or rights-of-way to be furnished by the OWNER for construction operations will be specifically shown on the Plans.
- c) The Contractor shall construct and maintain all roads necessary to reach the various parts of the Work and for the transportation thereto of construction material and personnel. The cost of constructing and maintaining such roads shall be borne by the Contractor.

**B-33 County's Right to Audit and Preservation of Records**

- a) The Contractor shall maintain books, records and accounts of all costs in accordance with generally accepted accounting principles and practices. The OWNER, the State, the Comptroller General of the United States, and its authorized representatives shall have the right to audit the books, records and accounts of the Contractor under any of the following conditions:
  - (i) The Contract is terminated for any reason in accordance with the provisions of the Contract Documents in order to arrive at equitable termination costs;
  - (ii) In the event of a disagreement between the Contractor and the OWNER over the amount due the Contractor under the terms of the Contract;
  - (iii) To check or substantiate any amounts invoiced or paid which are required to reflect the costs of the Contractor, or the Contractor's efficiency or effectiveness under this Contract or in connection with extras, changes, claims, additions, backcharges, or others, as may be provided for in this Contract; and/or
  - (iv) If it becomes necessary to determine the OWNER's rights and the Contractor's obligations under the Contract or to ascertain facts relative to any claim against the Contractor which may result in a charge against the OWNER;
  - (v) To determine any difference in cost occasioned by a permissible substitution;
  - (vi) To make audits, examinations, excerpts, and transcriptions pertinent to the loan or grant financing on this project.
  - (vii) For any other reason in the OWNER's sole judgment.
- b) If any of the conditions stated in paragraph B-33(a) are satisfied, Contractor shall provide the OWNER (or its representatives), unlimited, reasonable access during working hours to the Contractor's books and records under the conditions stated above. The OWNER's audit rights shall be liberally construed in the OWNER's favor.
- c) The Contractor, from the effective date of final payment or termination hereunder, shall preserve and make available to the OWNER (or its Representatives) for a period of three (3) years thereafter, at all reasonable times at the office of the Contractor (but without any charge to the OWNER), all its books, records, documents, photographs, micro-photographs, and other evidence bearing on the costs and expenses of the Contractor under this Contract and relating to the Work hereunder.
- d) The OWNER will make all payments required of it under this Contract subject to audit, under circumstances stated above, which audit may be performed at the OWNER's option, either during the Contract time period or during the record retention time period. Regardless of authorization, approval or acceptance, signatures or letters which are given by the OWNER and are part of the OWNER's control systems or are requested by the Contractor, the payments made under this Contract shall not constitute a waiver or agreement by the OWNER that it accepts as correct the billings, invoices or other charges on which the payments are based. If the OWNER's audit produces a claim against the Contractor, the OWNER may pursue all its legal remedies even though it has made all or part of the payments required by this Contract.
- e) If any audit by the OWNER or its representative discloses an underpayment by the OWNER pursuant to the terms of the Contract Documents, the OWNER shall have the duty to pay any amount found by the audit to be owed to the Contractor. If such audit discloses an overpayment, the Contractor shall have the obligation to reimburse the OWNER for the amount of the overpayment. The OWNER's right to claim reimbursement from the Contractor of any

overpayment shall not be terminated or waived until three (3) years after the completion of the OWNER's audit or upon the termination of audit rights under subparagraph B-33(a), whichever date is later. The obligation of the Contractor to make reimbursements hereunder shall not terminate except as provided by law.

The OWNER's right to audit and the preservation of records shall terminate at the end of three (3) years after the date final payment is made or termination of the Contract. The Contractor shall include this "Right to Audit and Preservation of Records" clause in all subcontracts issued by it shall require the same to be inserted by all lower tier Subcontractors in their subcontracts, for any portion of the Work. Should Contractor fail to include this clause in any such contract or lower tier contract, or otherwise fail to insure the OWNER's rights hereunder, Contractor shall be liable to the OWNER for all costs, expenses and attorney's fees which the OWNER may have to incur obtaining or attempting to obtain an audit or inspection of or the restoration of records which otherwise have been available to the OWNER from said persons under this clause. Such audit may be conducted by the OWNER or its authorized representative.

ARTICLE III. PROGRESS AND COMPLETION OF WORK

**B-34** Progress Schedule

The Contractor shall submit to the OWNER such schedules of quantities and costs, Progress Schedules, payrolls, reports, estimates, records and other data, where applicable, as are required by the Contract Documents for the Work to be performed.

Prior to the first partial payment estimate, the Contractor shall submit construction Progress Schedules showing the order in which it proposes to carry on the Work, including dates at which it will start the various parts of the WORK, estimated date of completion of each part and as applicable:

- a) The dates of work with anticipated service interruptions.
- b) Respective dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies, and equipment.
- c) The Contractor shall also submit a schedule of payments that it anticipates it will earn during the course of the Work.

The Progress Schedules shall be submitted regularly and shall cover a time period satisfactory to the Owner's Representative. The Contractor shall also forward to the Owner's Representative, with the request for progress payment each month, a summary report of the progress of the various parts of the Work under the Contract in the shops and in the field, stating the existing status, rate of progress, estimated time of completion, and cause of delay, if any. If the Work is behind the submitted schedule, the Contractor shall submit in writing a plan acceptable to the OWNER and Owner's Representative for bringing the Work up to schedule.

**B-35** Commencement and Progress of the Work and Time of Completion

Prior to the start of construction, the OWNER will conduct a preconstruction conference. At the conference, the OWNER will review the planned development with the Owner's Representative, Contractor, and other interested parties. Items to be reviewed include materials, equipment, rights-of-way, schedules and all arrangements for prosecuting the Work.

The Contractor diligently prosecute the Work to completion within one hundred eighty (180) working days. Contractor shall be prepared with equipment, materials, and personnel to be able to initiate the project within 14 calendar days of issuance of the notice to proceed and shall complete all contract required work within the available working days. Required training and demonstration will be completed at the end of the project. Contractor to provide a detailed schedule for review and approval by the County including anticipated equipment delivery times.

**B-36** Suspension of Work

- a) The Owner's Representative may at any time, by notice in writing to the Contractor, suspend any part of the Work for such period of time as may be necessary to prevent improper execution of the Work on the project by the Contractor, its Subcontractors or agents, and the Contractor shall have no claim for damages or additional compensation on account of any such suspension.
- b) The OWNER may at any time suspend any part or all of the Work upon ten (10) calendar days written notice to the Contractor, who shall thereupon discontinue all work suspended except for all operations to prevent loss or damage to work already executed as may be directed by the Owner's Representative. In the event a part of the Work is suspended, the Contractor, if the suspension is not through its fault or the fault of its Subcontractors or agents, shall be paid on the same basis as Extra Work for costs of work performed in accordance with such orders of the Owner's Representative during such suspension, provided that this shall not include any cost pertaining to work not suspended by said notice. Work shall be resumed by the Contractor after such suspension on written notice from the OWNER.

- c) In the event of any suspension of the Work in whole or in part under subsection (b) above, the Contractor shall be entitled to an extension of time wherein to complete the Work to the extent of the delay caused the Contractor thereby.
- d) In the event the entire Work shall be suspended by order of the OWNER, as hereinabove provided, and shall remain so suspended for a period of sixty (60) consecutive calendar days, through no fault of the Contractor, and notice to resume the Work shall not have been served on the Contractor as hereinabove provided, Contractor may, at its option, by written notice to the OWNER, terminate the Contract in the same manner as if the termination had been initiated by the OWNER, and the OWNER shall have no claim for damages because of such termination of the Contract.
- e) If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) calendar days by the OWNER or under an order of Court or other public authority, or the Owner's Representative fails to act on any request for payment within thirty (30) calendar days after it is submitted, or the OWNER fails to pay the Contractor substantially the sum approved by the Owner's Representative or any final award by arbitration or litigation within thirty (30) calendar days of its approval and presentation, then the Contractor may, after ten (10) calendar days from delivery of a written notice to the OWNER and the Owner's Representative, terminate the Contract and recover from the OWNER payment for all Work executed and all expenses sustained.

In addition and in lieu of terminating the Contract, if the Owner's Representative has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the Contractor may upon ten (10) calendar days written notice to the OWNER and the Owner's Representative stop the Work until he has been paid all amounts then due, in which event and upon resumption of the Work, Change Orders shall be issued for adjusting the Contract Price or extending the Contract Time or both to compensate for the costs and delays attributable to the stoppage of the Work.

If the performance of all or any portion of the Work is suspended, delayed, or interrupted as a result of a failure of the OWNER or Owner's Representative to act within the time specified in the Contract Documents, or if no time is specified, within a reasonable time, an adjustment in the Contract Price or an extension of the Contract Time, or both, shall be made by Change Order to compensate the Contractor for the costs and delays necessarily caused by the failure of the OWNER or Owner's Representative.

If the Contractor intends to file a claim for additional compensation for a delay caused by the OWNER or Owner's Representative at a particular time, he shall file a Notice of Claim with the OWNER within seven (7) calendar days of the beginning of the occurrence. The Notice of Claim shall be in duplicate, in writing, and shall state the circumstances and the reasons for the Claim, but need not state the amount. No Claim for additional compensation will be considered unless a Notice of Claim has been filed with the OWNER within the time and in the manner stated above. Contractor's failure to file a claim shall constitute a waiver.

#### B-37 Termination For Default - Damages For Delay - Timely Extension

- a) The Contractor shall at all times employ such force, plant, materials, and tools as will be sufficient, in the opinion of the Owner's Representative, to prosecute the Work at not less than the rates fixed under the terms of the Contract and to complete the Work or any part thereof within the time limits fixed therein. If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will ensure the completion within the time specified in the Contract, or any extension thereof, or fails to complete said Work within such time, the OWNER may, after giving ten (10) calendar days written notice to the Contractor, terminate its right to proceed with the Work or such part of the Work as to which there has been delay.
- b) The Contractor's right to proceed shall not be so terminated nor the Contractor charged with

resulting damage if:

- (i) The delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to Acts of God, acts of the public enemy, acts of the OWNER, acts of another contractor in the performance of a Contract with the OWNER, fires, floods, excluding site flooding due to groundwater, epidemics, quarantine restrictions, unusually severe weather, as determined by the Owner's Representative; and
  - (ii) The Contractor shall, within 48 hours of the start of the occurrence, give notice to the OWNER of the cause of the potential delay and an estimate of the possible time extension involved. The Contractor, within seven (7) calendar days from the beginning of any such delay (unless the Owner's Representative grants further period of time before the date of final payment under the Contract), notifies the Owner's Representative in writing of the causes of delay and requests an extension of time.
  - (iii) The Owner's Representative shall ascertain the facts and the extent of the delay and extend the time for completing the Work when, in its judgment, the findings of fact justify such an extension, and its findings of fact shall be final and conclusive on the parties.
- c) A request for an extension of time, or the granting of an extension of time, shall not constitute a basis for any claim against the OWNER for additional compensation or damages unless caused by the OWNER or another contractor employed by the OWNER.
- d) If the Contractor should be adjudged bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed for the Contractor on account of its insolvency and not be discharged within ten (10) calendar days after its appointment, or if the Contractor should fail to make prompt payments to Subcontractors or suppliers, or should it persistently disregard laws, ordinances, or the instructions of the Owner's Representative, or otherwise commit a substantial violation of any provisions of the Contract, the OWNER may, after giving ten (10) calendar days written notice to the Contractor, terminate the Contract and the Contractor's right to proceed with the Work.
- e) No extension of time will be considered for time lost due to weather conditions normal to the area. Unusual weather conditions, if determined by the Owner's Representative to be of a severity that could not be predicted, may be considered as cause for an extension of Contract completion time.
- f) Delays in delivery of equipment or material purchased by the Contractor or his Subcontractors shall not be considered as a just cause for delay. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting delivery, and installation of all equipment and materials.
- g) The rights and remedies of the OWNER provided in this section are in addition to any of the rights and remedies provided by law or under this Contract.
- h) In addition to the OWNER's rights under this section, if at any time before completion of the Work under the Contract, it shall be determined by the OWNER that reasons beyond the control of the parties hereto render it impossible or against the interests of the OWNER to complete the Work, or if the Work shall be stopped by an injunction of a court of competent jurisdiction or by order of any competent authority, the OWNER may, upon ten (10) calendar days written notice to the Contractor, discontinue the Work and terminate the Contract. Upon service of such notice of termination, the Contractor shall discontinue the Work in such manner, sequence, and at such times as the Owner's Representative may direct. The Contractor shall have no claim for damages for such discontinuance or termination, nor any claim for anticipated profits on the Work thus dispensed with, nor any other claim except for the Work actually performed up to the time of discontinuance, including any extra Work ordered by the Owner's Representative to be done, nor for any claim for liquidated damages in accordance with the provisions of Section B-39.

B-38 Rights of OWNER Upon Termination

- a) In the event the right of the Contractor to proceed with the Work, or any portion thereof, has been terminated because of the fault of the Contractor and the Contractor has been given ten (10) calendar days notice to cure such fault and has not done so, the OWNER may take over the Work and prosecute the same to completion by contract or any other method the OWNER deems expedient, and may take possession of and utilize in completing the Work such materials, appliances, equipment and plant as may be on the site of the Work and necessary therefor. Whether or not the Contractor's right to proceed with the Work is terminated, it and its sureties shall be liable for all damages including costs of managerial and administrative services, engineering, legal and other consultant fees, sustained or incurred by the OWNER in enforcing the provisions of Section B-37 and in completing or causing to complete the Contract Work.
- b) Upon termination the Contractor shall not be entitled to receive any further payment until the Work is finished. If upon completion of the Work the total cost to the OWNER, including engineering, legal and other consultant fees, costs of managerial and administrative services, construction costs, and liquidated damages shall be less than the amount which would have been paid if the Work had been completed by the Contractor in accordance with the terms of the Contract, then the difference shall be paid to the Contractor in the same manner as the final payment under the Contract. If the total cost incurred by the OWNER on account of termination of the Contract and subsequent completion of the Work by the OWNER by whatever method the OWNER may deem expedient shall exceed said amount which the Contractor would otherwise have been paid, the Contractor and its sureties shall be liable to the OWNER for the full amount of such excess expense.
- c) The rights and remedies of the OWNER provided in this section are in addition to any of the rights and remedies provided by the law or under this Contract.

B-39 Failure to Complete the Work in the Time Agreed Upon - Liquidated Damages

- a) Liquidated Damages - It is agreed by the parties to the Contract that time is of the essence; and that in case all the Work is not completed before or upon the expiration of the time limit as set in the Bid, Contract and Progress Schedule, or within any time extensions that may have been granted, damage will be sustained by the OWNER; and that it may be impracticable to determine the actual amount of damage by reason of such delay; and it is, therefore, agreed that the Contractor shall pay to the OWNER as damages the amount of \$2,000.00 per day for each and every day's delay in finishing the Work in excess of the number of days specified. The parties expressly agree that this liquidated damage clause is reasonable under the circumstances existing at the time the Contract was made. The OWNER shall have the right to deduct the amount of liquidated damages from any money due or to become due the Contractor.
- b) In addition, the OWNER shall have the right to charge to the Contractor and to deduct from the final or progress payments for the Work the actual cost to the OWNER of legal, engineering, inspection, superintendence, and other expenses, which are directly chargeable to the Contract and which accrue during the period of such delay, except that the cost of final inspection and preparation of the final estimate shall not be included in the charges.
- c) Exclusions - Notwithstanding the provisions of subsection (a), the Contractor shall not be liable for liquidated damages or delays caused by the removal or relocation of utilities when such removal or relocation is the responsibility of the OWNER or the owner of the utility under Government Code Section 4215.

B-40 Clean-up

During the progress of the Work, the Contractor shall maintain the site and related structures and equipment in a clean, orderly condition and free from unsightly accumulation of rubbish. Upon completion of Work and before the final estimate is submitted, the Contractor shall at its own cost and expense

remove from the vicinity of the Work all plants, buildings, rubbish, unused work materials, concrete forms, and temporary bridging and other like materials, belonging to it or used under its direction during the construction, and in the event of its failure to do so, the same may be removed by the OWNER after ten (10) calendar days notice to the Contractor, such removal to be at the expense of the Contractor. Where the construction has crossed yards or driveways, they shall be restored by the Contractor to the complete satisfaction of the Owner's Representative, at the Contractor's expense.

ARTICLE IV. LEGAL RELATIONS AND RESPONSIBILITY

B-41 Compliance with Laws - Permits, Regulations, Taxes

Contractor is an independent contractor and shall at its sole cost and expense comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the Work, including, but not limited to, environmental, labor, procurement and safety laws, rules, regulations, permits, and ordinances, obtain all necessary permits and licenses therefor, pay all manufacturers' taxes, sales taxes, use taxes, processing taxes, and all Federal and state taxes, insurance and contributions for social security and unemployment which are measured by wages, salaries or any remuneration paid to Contractor's employees, whether levied under existing or subsequently enacted laws, rules or regulations. Contractor shall also pay all property tax assessments on materials or equipment used until acceptance by the OWNER. Contractor shall not be debarred, suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, "Debarment and Suspension." If any discrepancy or inconsistency is discovered in the Plans or Specifications, or in this Contract in relation to any such law, rule, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the Owner's Representative in writing. It shall also protect and indemnify the OWNER, the Owner's Representative, and all of the OWNER's officers, agents, and servants against any claim or liability arising from or based upon the violation of any such law, rule, ordinance, regulation, order or decree, whether by the Contractor itself or by its employees. Particular attention is called to the following:

- a) Without limitation, materials furnished and performance by Contractor hereunder shall comply with Safety Orders of the Division of Industrial Safety, State of California, Federal Safety regulations of the Bureau of Labor, Department of Labor; and any other applicable Federal regulations.
- b) The Contractor, upon request, shall furnish evidence satisfactory to the OWNER and Owner's Representative that any or all of the foregoing obligations have been or are being fulfilled. The Contractor warrants to the OWNER that it is licensed by all applicable governmental bodies to perform this Contract and will remain so licensed throughout the progress of the Work, and that it has, and will have, throughout the progress of the Work, the necessary experience, skill and financial resources to enable it to perform this Contract.
- c) CHILD SUPPORT COMPLIANCE ACT - Supplier acknowledges that it is the policy of this State that anyone who enters into a contract with the county shall recognize the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code. Supplier further acknowledges that to the best of its knowledge it is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the Employment Development Department.
- d) NONDISCRIMINATION CLAUSE - During the performance of this Agreement, Supplier, its contractors and subcontractors, shall not deny the Agreement's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age, or sex. Supplier, its contractors and subcontractors shall ensure that the evaluation and treatment of employees and applicants for employment are free of such discrimination.

Supplier, its contractors and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code, Section 12900 et seq.), the regulations promulgated there under (California Code of Regulations, Title 2, Section 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code

(Government Code, Sections 11135-11139.5) and the regulations or standards adopted by the awarding State Agency to implement such article.

By signing this Agreement, Supplier assures County that it shall comply with the requirements of the Americans with Disabilities Act (ADA) of 1990, (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA; the Civil Rights Act of 1964, as amended, 42 U.S.C. 2000d (1988) et seq.; Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. 794 (1989); Federal Water Pollution Control Act Amendments of 1972, Pub.L. No. 92-500, 86 Stat 816; and the Age Discrimination Act of 1975, as amended, 42 U.S.C. 6102 (1994); together with all applicable regulations and guidelines adopted to implement same. Said group of laws and requirements are collectively referred to in this Agreement as the "anti-discrimination laws".

Supplier agrees to collect and maintain information to show compliance with the "anti-discrimination laws" including a list of discrimination complaints, reports of any compliance reviews conducted by other agencies descriptions of any pending discrimination-based lawsuits and data on the racial, ethnic, national origin, sex and handicap characteristics of the population it serves. Supplier, its contractors and subcontractors shall give written notice of their obligations under this Article to labor organizations with which they have a collective bargaining or other agreement.

Supplier's signature on this Agreement shall constitute a certification under penalty of perjury under the laws of the State of California that Supplier has, unless exempted, complied with the nondiscrimination program requirements of Government Code, Section 12990, and Title 2, California Code of Regulations, Section 8103.

Supplier shall include the nondiscrimination and compliance provisions of this Section B-43 of the General Conditions in all contracts and subcontracts to perform work on the Project.

- e) **WORKERS' COMPENSATION CLAUSE** - As required by Section 1860 of the California Labor Code and in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of workers' compensation to its employees. Supplier affirms that it is aware of the provisions of Section 3700 of the California Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and Supplier affirms that it will comply with such provisions before commencing performance of work under this Agreement and will make its contractors and subcontractors aware of this provision.

#### B-42 Prevailing Wage

- a) **Payroll Records:** Contractor shall keep accurate payroll records in format specified by the Division of Labor Standards Enforcement. Said information shall include, but not be limited to, a record of the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and actual per diem wages paid to each journeyman, apprentice, or worker employed by the contractor. Copies of such record shall be made available for inspection at all reasonable hours, and a copy shall be made available to employee or his authorized representative, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards in compliance with California Labor Code, Section 1776. Contractor and subcontractors shall furnish and submit electronic certified payrolls directly to the Labor Commissioner, and duplicate copies available to the owner.
- b) **Prevailing Wages:** Notice is hereby given that, pursuant to 1773 of the Labor Code of the State of California, the owner has obtained from the Director of the Department of Industrial Relations the

general prevailing rate of per diem wages and the general prevailing rate for holidays and overtime work for each craft, classification, or type of worker required to execute the contract. A copy of said prevailing rate of per diem wages is on file in the principal office of the owner, to which reference is hereby made for further particulars.

- c) The OWNER will not recognize any claims for additional compensation because of the payment of the wages set forth in the Contract Documents. The possibility of wage increases is one of the elements to be considered by the Contractor in determining its proposal, and will not under any circumstances be considered as the basis of a claim against the OWNER or the Owner's Representative.

**B-43 Labor Compliance**

Supplier shall comply with all applicable provisions of Labor Code, Division 2, Part 7, Chapter 1, Article 2, commencing with Section 1770 and implementing regulations regarding labor compliance monitoring and prevailing wage requirements. Supplier's failure or refusal to comply with this requirement shall be considered a substantial breach of this Agreement.

**B-44 Eight-Hour Day Limitation**

- a) In accordance with the provisions of the Labor Code, and in particular, Sections 1810 to 1815 thereof, inclusive, eight (8) hours labor shall constitute a day's work, and no worker, in the employ of said Contractor, or any Subcontractor, doing or contracting to do any part of the Work contemplated by this Contract, shall be required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of those provisions; provided that subject to Labor Code Section 1815, a worker may perform work in excess of either eight (8) hours per day or forty (40) hours during any one week upon compensation for all hours worked in excess of eight (8) hours per day or forty (40) hours during any one week at not less than one and one-half times the basic rate of pay.
- b) The Contractor and each Subcontractor shall also keep an accurate record showing the names, addresses, social security numbers, work classifications, 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 the Contractor and by the Subcontractor in connection with the Work specified herein, which record shall be open at all reasonable hours to the inspection of the OWNER, State and Federal officers and agents; and it is hereby further agreed that, except as provided in (a) above, the Contractor shall forfeit as a penalty to the OWNER the sum of one hundred dollars (\$100) for each worker employed in the performance of this Contract by it or by any Subcontractor under it for each calendar day during which such worker is required or permitted to labor more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of Sections 1810 through 1815.

**B-45 Compliance with State Requirements for Employment of Apprentices**

The Contractor's attention is directed to Section 1777.5 through 1777.7 of the Labor Code; provisions of those Sections pertaining to employment of registered apprentices are hereby incorporated by reference into these Specifications. As applicable, the Contractor or any Subcontractor employed by it in the performance of the Contract Work shall take such actions as necessary to comply with the provisions of Section 1777.5 through 1777.7.

**B-46 Underground Utilities**

In accordance with Government Code Section 4215, the Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating existing main or trunkline utility facilities not indicated in the Contract Plans and Specifications with reasonable accuracy, and for the equipment on the project necessarily idled during such Work; provided that the Contractor shall first notify the Owner's Representative, as specified herein

before commencing work on locating, repairing damage to, removing or relocating such utilities. If the Contractor while performing the Work discovers utility facilities not identified by the Owner in the Contract Plans or specifications, the Contractor shall immediately notify the Owner's Representative and utility in writing.

**B-47**    Water Pollution

The Contractor shall exercise every reasonable precaution to protect streams, lakes, reservoirs, and other waters of the State and/or United States from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials and shall conduct and schedule its operations so as to avoid or minimize muddying and silting of said streams, lakes, reservoirs, and water bodies. Care shall be exercised to preserve vegetation beyond the limits of construction. The Contractor shall comply with Section 5650 of the California Fish and Wildlife Code, the State of California Construction General Permit, and all other applicable statutes and regulations relating to the prevention and abatement of water pollution.

**B-48**    Payment of Taxes

The Contract prices paid for the Work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by Federal, State, or local governments.

**B-49**    Permits and Licenses

Except as otherwise provided in this Contract, the Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the lawful prosecution of the Work.

**B-50**    Patents

The Contractor shall pay all applicable royalties and license fees and assume all costs arising from the use of patented materials, equipment and devices. The Contractor shall defend all suits or claims for infringement of any patent rights and save the OWNER and Owner's Representative and their duly authorized representatives harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified; however if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner's Representative.

**B-51**    Public Convenience

- a) This section defines the Contractor's responsibility with regard to convenience of the public and public traffic in connection with its operations.
- b) The Contractor shall so conduct its operations as to offer the least possible obstruction and inconvenience to the public and it shall have under construction no greater length or amount of Work than it can prosecute properly with due regard to the rights of the public.
- c) Unless otherwise provided in the Contract Documents, all public traffic shall be permitted to pass through the Work with as little inconvenience and delay as possible.
- d) Spillage resulting from hauling operations along or across any publicly traveled way shall be removed immediately by the Contractor at its expense.
- e) Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

**B-52**    Safety

- a) General - The Contractor shall be solely and completely responsible for the conditions of the job site, including safety of all persons and property during performance of the Work. This

requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable Federal, State, and local laws, ordinances, and codes, and to the rules and regulations established by the California Division of Industrial Safety, and to other rules of law applicable to the Work.

- b) The services of the Owner's Representative in conducting construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing or scaffolding or safety measures, in, on, or near the construction site, and shall not be construed as supervision of the actual construction nor make the Owner's Representative or the OWNER responsible for providing a safe place for the performance of work by the Contractor, Subcontractors, or suppliers; or for access, visits, use work, travel or occupancy by any person.
- c) The Contractor shall carefully instruct all personnel working in potentially hazardous work areas as to the potential dangers and shall provide such necessary safety equipment and instruction as is necessary to prevent injury and damage to property. The Contractor shall appoint for the duration of this Contract, a qualified supervisor employee to develop and/or supervise the Contractor's job safety program that will effectively implement the safety provisions of the above agencies.
- d) The Contractor, as a part of his safety program, shall maintain at its office or other well-known place at the job site, safety equipment applicable to the Work as prescribed by the aforementioned authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured on the job site.
- e) If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Owner's Representative and the OWNER. In addition, the Contractor must promptly report in writing to the Owner's Representative all accidents whatsoever arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the site, giving full details and statements of witnesses.
- f) If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Owner's Representative, giving full details of the claim.
- g) All Work and materials shall be in strict accordance with all applicable State, Federal and local laws, rules, regulations, and codes.
- h) Nothing in this Contract is to be construed to permit work not conforming to governing law. When Contract Documents differ from governing law, the Contractor shall furnish and install the higher standards called for without extra charge. All equipment furnished shall be grounded and provided with guards and protection as required by safety codes. Where vapor-tight or explosion-proof electrical installation is required by law, this shall be provided.
- i) Hazardous Wastes and Unforeseen Conditions - In accordance with Section 7104 of the State Public Contract Code, if the Work contemplated hereunder involves digging trenches or other earthquake activities, the Contractor shall promptly, and before the following conditions are disturbed, notify the OWNER, in writing, of any: (i) material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law; (ii) Subsurface or latent physical conditions at the site differing from those indicated; or (iii) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract. The OWNER shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any

part of the Work shall issue a Change Order under the procedures described herein. In the event that a dispute arises between the OWNER and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for herein, but shall proceed with all Work to be performed hereunder. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the OWNER and Contractor.

- j) The Contractor shall perform all Work in a fire-safe manner. He shall supply and maintain onsite adequate firefighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable federal, state, and local fire prevention regulations and where the regulations do not cover, with applicable parts of the National Fire Prevention Standard for "Safeguarding Building Construction Operations," (NFPA No. 241).

B-53 Protection of Person and Property

- a) The Contractor shall take whatever precautions are necessary to prevent damage to all existing improvements, including above ground and underground utilities, trees, shrubbery that is not specifically shown to be removed, fences, signs, mailboxes, survey markers and monuments, buildings, structures, property belonging to the OWNER, County, adjacent property, and any other improvements or facilities within or adjacent to the Work. If such improvements or property are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored, at the Contractor's expense, to a condition at least as good as the condition they were in prior to the start of the Contractor's operations.
- b) The Contractor shall adopt all practical means to minimize interference to traffic and public inconvenience, discomfort or damage. The Contractor shall protect against injury any pipes, conduits or other structures, crossing the trenching or encountered in the Work and shall be responsible for any injury done to such pipes or structures, or damage to property resulting therefrom. The Contractor shall support or replace any such structures without delay and without any additional compensation to the entire satisfaction of the Owner's Representative. All obstructions to traffic shall be guarded by barriers illuminated at night. The Contractor shall be responsible for all damage to persons and property directly or indirectly caused by its operations and, under all circumstances, the Contractor must comply with the laws and regulations of the County and the State of California relative to safety of persons and property and the interruption of traffic and the convenience of the public within the respective jurisdictions.
- c) The Contractor is cautioned that it must replace all improvements in rights-of-way and within the public streets to a condition equal to what existed prior to the Contractor's entry onto the job.
- d) Type and time of construction required at any road subject to interference by Contract Work will be determined by those authorities responsible for maintenance of said road. It shall be the responsibility of the Contractor to determine the nature and extent of all such requirements, including provision of temporary detours as required. As required at any road crossing, the Contractor shall provide all necessary flag persons, guardrails, barricades, signals, warning signs and lighting to provide for the safety of existing roads and detours. Immediately after the need for temporary detours ceases, or when directed, the Contractor shall remove such detours and perform all necessary cleanup work, including replacement of fences, and removal of pavement. Included shall be all necessary replacement of existing roadway appurtenances, grading work, soil stabilization and dust control measures, as required and directed. The cost of all Work specified under this Section shall be borne by the Contractor.
- e) The Contractor shall examine all bridges, culverts, and other structures over which it will move its materials and equipment, and before using them, it shall properly strengthen such structures where necessary. The Contractor shall be responsible for any and all injury or damage to such structures caused by reason of its operations.

**B-54 Responsibility for Repair of Facilities**

All public or private facilities, including but not limited structures, telephone cables, roadways, parking lots, private drives, levees and embankments disturbed during construction of the Work shall be repaired and/or replaced by the Contractor to match facilities existing prior to construction. In addition, the Contractor shall be responsible for any settlement damage to such facilities or adjoining areas for a period of one year after acceptance of such required facilities.

**B-55 Resolution of Construction Claims**

- a) For any claim arising under this contract, the following procedures will apply:
- (i) The claim must be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the day of final payment. Nothing in this subsection is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth elsewhere in this Contract.
- b) The Contractor shall proceed with the Work in accordance with the Plans and Specifications and determinations and instructions of the OWNER Owner's Representative during the resolution of any claims.

**B-56 OWNER's Repair**

In the event the Contractor refuses or neglects to make good any loss or damage for which the Contractor is responsible under this Contract, the OWNER may itself, or by the employment of others, make good any such loss or damage, and the cost and expense of doing so, including any reasonable engineering, legal and other consultant fees, and any costs of administrative and managerial services, shall be charged to the Contractor. Such costs and expenses may be deducted by the OWNER from claims for payment made by the Contractor for Work completed or remaining to be completed.

**B-57 Antitrust Claim Assignment**

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to this contract, the Contractor and all Subcontractors shall offer and agree to assign to the OWNER all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or subcontract. This assignment shall be made and become effective at the time the OWNER tenders final payment to the Contractor, without further acknowledgement by the parties.

**B-58 Waiver of Right to Rescind For Material Breach**

The Contractor agrees that it can be adequately compensated by money damages for any breach of this Contract which may be committed by the OWNER and hereby agrees that no default, act, or omission of the OWNER or the Owner's Representative, except for failure to make progress payments as a required by Section B-68, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of this Contract or (unless the OWNER shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. The Contractor hereby waives any and all rights and remedies to which it might otherwise be or become entitled, save only its right to money damages.

**B-59 Contractor's License Notice**

Contractors are required by law to be licensed and regulated by the contractors' state license board which has jurisdiction to investigate complaints against contractors of a complaint if filed within three (3) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the registrar, contractors' state license board, Sacramento, California.

ARTICLE V. INSURANCE AND LIABILITY

B-60 Insurance

- c) Neither the Contractor nor any Subcontractors shall commence any Work until all required insurance has been obtained at their own expense. Such insurance must have the approval of the OWNER as to limit, form, and amount, and shall be placed with insurers with a current A.M. Best's rating of no less than A:VII.
- d) Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guarantee period.
- e) Prior to execution of the Contract, the Contractor shall furnish the OWNER with original endorsements effecting coverage for all policies required by the Contract. The Contractor shall not permit any Subcontractor identified in the Designation of Subcontractors form to commence Work on this project until such Subcontractor has furnished the OWNER with original endorsements effecting coverage for all insurance policies required by the Contract. The endorsements shall be signed by a person authorized by the insurer to bind coverage on its behalf. The endorsements are to be on forms provided by the OWNER. As an alternative to the OWNER's forms, the Contractor's insurer may, subject to the approval of the OWNER, provide complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by this paragraph. The Contractor agrees to furnish one copy of each policy to the OWNER, and additional copies as requested in writing, certified by an authorized representative of the insurer.
- f) All of the Contractor's policies shall contain an endorsement providing that written notice shall be given to the OWNER at least sixty (60) calendar days prior to termination, cancellation, or reduction of coverage in the policy.
- g) Any policy or policies of insurance that the Contractor elects to carry as insurance against loss or damage to its construction equipment and tools shall include a provision therein providing a waiver of the insurer's right to subrogation against the OWNER and the Owner's Representative.
- h) The requirements as to the types, limits, and the OWNER's approval of insurance coverage to be maintained by the Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Contractor under the Contract.
- i) In addition to any other remedy the OWNER may have, if the Contractor or any of the Subcontractors fails to maintain the insurance coverage as required in this Section, the OWNER may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as required herein, and the OWNER may deduct the cost of such insurance from any amounts due or which may become due the Contractor under this Contract.
- j) The Contractor and all Subcontractors shall, at their expense, maintain in effect at all times during the performance or Work under the Contract not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the OWNER. The maintenance by the Contractor and all Subcontractors of the following coverage and limits of insurance is a material element of this Contract. The failure of the Contractor or any Subcontractor to maintain or renew coverage or to provide evidence of renewal may be treated by the OWNER as a material breach of this Contract.
- k) Worker's Compensation and Employer's Liability Insurance.
  - (i) Worker's Compensation - Insurance to protect the Contractor or Subcontractor from all claims under Worker's Compensation and Employer's Liability Acts, including Longshoremen's and Harbor Worker's Act. Such coverage shall be maintained, in type and amount, in strict compliance with all applicable State and Federal statutes and regulations. The Contractor

shall execute a certificate in compliance with Labor Code Section 1861, on the form provided in the Contract Documents.

- (ii) Claims Against OWNER - If an injury occurs to any employee of the Contractor or any of the Subcontractors for which the employee or its dependents, in the event of its death, may be entitled to compensation from the OWNER under the provisions of the said Acts, or for which compensation is claimed from the OWNER, there will be retained out of the sums due the Contractor under this Contract, an amount sufficient to cover such compensation as fixed by said Acts, until such compensation is paid or it is determined that no compensation is due. If the OWNER is required to pay such compensation, the amount so paid will be deducted and retained from such sums due, or to become due the Contractor.
- (iii) Comprehensive General and Automobile Liability Insurance - The insurance shall include, but shall not be limited to, protection against claims arising from death, bodily or personal injury, or damage to property resulting from actions, failures to act, operations or equipment of the insured, or by its employees, agents, consultants, or by anyone directly or indirectly employed by the insured. Insurance shall be written with a limit of liability not less than \$2,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$4,000,000 aggregate for any damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$2,000,000 for all property damage sustained by one person in any one accident; and a limit of liability not less than \$4,000,000 aggregate for any such property damage sustained by two or more persons in any one accident. Any deductibles must be declared to and approved by the OWNER. At the option of the OWNER, either: the insurer shall reduce or eliminate such deductibles as respects the entity, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expense

The comprehensive general and automobile liability insurance coverage shall also include the following:

- 1) Provision or endorsement naming the OWNER, the County, the State, the Engineer and its consultants, and each of their officers, employees, and agents, each as additional insureds in regards to liability arising out of the performance of any Work under the Contract and providing that such insurance is primary insurance as respects the interest of the OWNER, the County, the State, and Engineer and that any other insurance maintained by the OWNER and Engineer is excess and not contributing insurance with the insurance required hereunder.
  - 2) "Cross Liability" or "Severability of Interest" clause.
  - 3) Broad Form Property Damage, Personal Injury, Contractual Liability, Protective Liability Completed Operations coverages and elimination of any exclusion regarding loss or damage to property caused by explosion or resulting from collapse of buildings or structures or damage to property underground, commonly referred to by insurers as the "XCU" hazards.
  - 4) Provision or endorsement stating that such insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Contractor under the Contract, including, without limitation, that set forth in Section B-61, Indemnity and Litigation Costs.
  - 5) Provision or endorsement stating that any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the OWNER, its officers, officials, employees, or volunteers.
- I) The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

- m) Builder's Risk or Installation Floater "All-Risk" Insurance is required.
- n) The contractor shall obtain and maintain a Contractor's Pollution Legal Liability Insurance with limits of no less than One Million Dollars (\$1,000,000.00) per occurrence or claim, and Two Million Dollars (\$2,000,000.00) in aggregate. If the project involved Asbestos, Asbestos legal liability must be included for coverage in the Pollution policy.

**B-61 Indemnity and Litigation Cost**

- a) Promptly upon execution of the Contract, the Contractor specifically obligates itself and hereby agrees to protect, hold free and harmless, defend and indemnify the OWNER, the County, the State, the Engineer and its consultants, and each of their officers, officials, employees and agents, from and against any and all liability, penalties, costs, losses, damages, expenses, causes of action, claims or judgments, including without limitation attorneys' fees and other costs of litigation, which arise out of or are in any way connected with the Contractor's, or its Subcontractors' or suppliers', performance of Work under this Contract or failure to comply with any of the obligations contained in the Contract. This indemnity shall not extend, however, to attorney fees and costs incurred by the OWNER in prosecuting or defending against the Contractor in any proceeding under Section B-8, and shall imply no reciprocal right of the Contractor in any action on the Contract pursuant to California Civil Code section 1717 or section 1717.5. To the extent legally permissible, this indemnity and hold harmless agreement by the Contractor shall apply to any acts or omissions, whether active or passive, on the part of the Contractor or its agents, employees, representatives, or Subcontractor's agents, employees and representatives, resulting in liability, irrespective of whether or not any acts or omissions of the parties to be indemnified hereunder may also have been a contributing factor to the liability, except such loss or damage which was caused by the active negligence, sole negligence or willful misconduct of the OWNER, the County, or the State, the Engineer and its consultants.
- b) In any and all claims against the OWNER, the County, the State, or the Engineer and its consultants, and each of their officers, employees and agents 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 Section 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 Worker's Compensation statutes, disability benefit statutes or other employee benefit statutes.
- c) Each party to this Contract has been represented by counsel in the negotiation and execution of this Contract.

**B-62 Protection of Work**

- a) The Contractor shall be responsible for the care of all Work until completion and final acceptance; and the Contractor shall, at its own expense replace damaged or lost material and repair damaged parts of the Work or the same may be done at the Contractor's expense by the OWNER and the Contractor and its sureties shall be liable therefore. The Contractor shall make its own provisions for properly storing and protecting all material and equipment against theft, injury, or damage from any and all causes. Damaged material and equipment shall not be used in the Work. The Contractor shall take all risks from floods and casualties except as provided by law, and shall make no charge for the restoration of such portions of the Work as may be destroyed or damaged by flood or other casualties or because of danger from flood or other casualties or for delays from such causes. The Contractor may, however, be allowed a reasonable extension of time on account of such delays, subject to the conditions hereinbefore specified. The Contractor shall not be responsible for the cost, in excess of five percent (5%) of the contracted amount, of repairing or restoring damage to the Work, if the damage was proximately caused by an earthquake in excess of a magnitude of 3.5 on the Richter Scale or by tidal waves; provided that the Work damaged was built in accordance with accepted and applicable building standards, and the Plans and Specifications of the OWNER.

- b) The Contractor shall be responsible for all damage to any property resulting from trespass by the Contractor or its employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor.

B-63 No Personal Liability

Neither the OWNER, the Owner's Representative, nor any of their other officers, agents, or employees nor any other public office shall be personally responsible for any liability arising under the Contract, except such obligations as are specifically set forth herein.

ARTICLE VI. MEASUREMENT AND PAYMENT

B-64 Measurement of Quantities

- a) Where the Contract provides for payment on a lump sum price basis, the Contractor shall submit a price breakdown to the Owner's Representative immediately after award of the Contract. The price breakdown as agreed upon between the Contractor and the Owner's Representative shall be used for preparing future estimates for partial payments to the Contractor and shall list the major items of Work and a price for each item. Overhead and other general costs and profit shall be prorated to each item so that the total of all items equals the lump sum price. The price breakdown shall be subject to the approval of the Owner's Representative and Contractor may be required to verify the prices for any or all items.

Where the Contract provides for payment on a unit price basis, the quantities of Work performed will be computed by the Owner's Representative on the basis of measurements taken by the Owner's Representative.

- b) Whenever the estimated quantities of Work to be done and materials to be furnished under this Contract are shown in any of the documents, they are given for use in comparing bids and the right is especially reserved, except as herein or otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the OWNER to complete the Work contemplated by this Contract and such increase or diminution shall in no way violate this Contract, nor shall any such increase or diminution give cause for claims, liability for damage or adjustment to the Contract bid price.

B-65 Scope of Payment

- a) The Contractor shall accept the compensation provided in the Contract as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed Work and for performing all Work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the Work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the acceptance by the OWNER and for all risks of every description connected with the prosecution of the Work, also for all expenses incurred in consequence of the suspension or discontinuance of the Work as provided in the Contract; and for completing the Work according to the Specifications and Plans. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective Work or material.
- b) No compensation will be made in any case for loss of anticipated profits. Increased or decreased Work involving supplemental agreements will be paid for as provided in such agreements.

B-66 Progress Estimate

At least ten (10) calendar days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the Owner's Representative a partial payment estimate filled out and signed by the Contractor covering the Work performed during the period covered by the partial pay estimate and supported by such data as the Owner's Representative may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material, and equipment and protect its interest therein, including, applicable insurance. The Owner's Representative will within seven (7) calendar days after receipt of each partial payment estimate either recommend payment to the OWNER or return the estimate to the Contractor indicating in writing its reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial pay estimate.

Payroll certification forms provided by the Contractor and fully executed shall be filed with the Owner's

Representative at the time of submission of each partial payment estimate and also when the claim for final payment is submitted. Wage Report forms shall be completed and submitted as set forth in B-42.

**B-67 Progress Payments**

- a) The Contractor is made aware that the OWNER will need to approve all partial payments.
- b) Upon receipt of an undisputed, properly submitted progress estimate from the Contractor, recommended by the Owner's Representative, the OWNER shall act in accordance with the following:
  - (i) Each payment request shall be reviewed by the OWNER as soon as practicable after receipt for the purpose of determining that the progress estimate is a proper payment request.
  - (ii) Any payment request determined not to be a proper payment request suitable for payment shall be returned to the Contractor as soon as practicable but not later than seven (7) calendar days after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.
- c) The number of days available to the OWNER to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the OWNER exceeds the seven-day return requirement set forth herein.
- d) The OWNER will pay the Contractor ninety-five percent (95%) of the amount of each progress estimate within thirty (30) calendar days after receipt of an undisputed, properly submitted progress estimate from the Contractor, recommended by the Owner's Representative. If the OWNER fails to pay an undisputed progress estimate within the allotted thirty (30) calendar days, the OWNER shall pay interest to the Contractor equivalent to the legal rate set forth in subdivision(s) of Section 685.010 of the Code of Civil Procedures. Five percent (5%) of amount of each estimate shall be retained by the OWNER until final completion and acceptance of all Work under contract.
- e) When, in the judgment of the Owner's Representative, the Work is not proceeding in accordance with the provisions of the Contract, or when in its judgment the total amount of the Work done since the last estimate amounts to less than \$1,000, no pay estimate will be prepared and no progress payment will be made.
- f) No progress estimate or payment shall be considered to be an approval or acceptance of any Work, materials, or equipment. Estimated amounts and values of Work done and materials and equipment furnished will be conformed with actual amounts and values as they become available in subsequent progress estimates, progress payments and the final estimate and payment. All estimates and payments will be subject to correction in subsequent progress estimates and payments and the final estimate and payment.
- g) The OWNER requires that any payments due to Subcontractors for a portion of the Work satisfactory completed shall be made by Contractor to Subcontractors within seven (7) calendar days of OWNER's payment to Contractor. Failure to make such payments in a timely fashion may result in the OWNER issuing future progress payments by joint check to the Contractor and Subcontractors.
- h) It is mutually agreed between the parties to the Contract that no payments made under the Contract, including progress payments and the final payment, shall be evidence of the performance of the Contract, either wholly or in part, and no payment shall be construed to be an acceptance of any defective or incomplete Work or improper materials.

B-68 Liens and Stop Notices

The Contractor agrees to keep the Work, the site of the Work and all monies held by the OWNER free and clear of all liens and stop notices related to labor and materials furnished in connection with the Work, if permitted by law. Furthermore, the Contractor waives any right it may have to file any type of lien or stop notice in connection with the Work. Notwithstanding anything to the contrary contained in the Contract documents, if any such lien or stop notice is filed or there is evidence to believe that lien or stop notice may be filed at any time during the progress of the Work or within the duration of this Contract, the OWNER may refuse to make any payment otherwise due the Contractor or may withhold any payment due the Contractor a sum sufficient in the opinion of the OWNER to pay all obligations and expenses necessary to satisfy such lien or stop notice. The OWNER may withhold such payment unless or until the Contractor, within ten (10) calendar days after demand therefor by the OWNER, shall furnish satisfactory evidence that the indebtedness and any lien or stop notice in respect thereof has been satisfied, discharged and released of record, or that the Contractor has legally caused such lien or stop notice to be released of record pending the resolution of any dispute between the Contractor and any person or persons filing such lien or stop notice. If the Contractor shall fail to furnish such satisfactory evidence within ten (10) calendar days of the demand therefor, the OWNER may discharge such indebtedness and deduct the amount thereof, together with any and all losses, costs, damages and attorney's fees suffered or incurred by the OWNER from any sum payable to the Contractor under the Contract documents, including but not limited to final payment and retained percentage. This Section shall be specifically included in all Subcontracts and purchase orders entered into by the Contractor.

B-69 Final Acceptance and Date of Completion

Whenever the Contractor shall deem all Work under this Contract to have been completed in accordance therewith, it shall so notify the Owner's Representative in writing, and the Owner's Representative shall promptly ascertain whether the Work has been satisfactorily completed and, if not, shall advise the Contractor in detail and in writing of any additional Work required. When all the provisions of the Contract have been fully complied with to the satisfaction of the Owner's Representative, it shall proceed with all reasonable diligence to determine accurately the total value of all Work performed by the Contractor at the prices set forth in the Contract or fixed by Change Orders, and the total value of all extra Work, all in accordance with the Contract. The Owner's Representative will then certify to said final estimate and to the completion of the Work, and will file copies thereof with the OWNER and the Contractor. The date of completion shall be the date upon which the OWNER makes its formal written acceptance of the Work.

B-70 Final Payment

Within ten (10) calendar days after the date of completion, the OWNER will file in the Office of the County Recorder, a Notice of Completion of the Work herein agreed to be done by the Contractor. On the expiration of thirty-five (35) calendar days after the recordation of such Notice of Completion the difference between said final estimate and all payments theretofore made to the Contractor shall be due and payable to the Contractor, subject to any requirements concerning the furnishings of a maintenance bond, and excepting only such sum or sums as may be withheld or deducted in accordance with the provisions of this Contract. All prior certifications upon which partial payments may have been made, being merely estimates, shall be subject to correction in the final certificate.

B-71 Final Release

Final payment to the Contractor in accordance with the final estimate is contingent upon the Contractor furnishing the OWNER with a signed written release of all claims against the OWNER arising by virtue of the Contract. Disputed Contract claims in stated amounts may be specifically excluded by the Contractor from the operation of the release. The release shall be in substantially the following form:

WAIVER AND RELEASE UPON FINAL PAYMENT

The undersigned has been paid in full by the OWNER for all labor, services, equipment and material furnished to the OWNER on the \_\_\_\_\_ Improvements located at \_\_\_\_\_, California, and does hereby waive and release the OWNER, its officers, agents, and employees, from all claims and liability to the Contractor arising out of, or in any way connected with, the Contract, except for the disputed contract claims specified below:

Notice of Disputed Claim

Amount of Claim

\$ \_\_\_\_\_

Dated: \_\_\_\_\_

\_\_\_\_\_  
(Name of Contractor)

By: \_\_\_\_\_  
(Title)

Any payment, however, final or otherwise shall not release the Contractor or its sureties from obligations under the Contract Documents or Performance and Payment Bonds.

**B-72 Right to Withhold Payments**

- a) In addition to all other rights and remedies of the OWNER hereunder and by virtue of the law, the OWNER may withhold or nullify the whole or any part of any partial or final payment to such extent as may reasonably be necessary to protect the OWNER from loss on account of:
- (i) Defective Work not remedied, irrespective of when any such Work be found to be defective;
  - (ii) Claims or liens filed or reasonable evidence indicating probable filing of claims or liens including, but not limited to claims under Sections 1775, 1776, or 1777.7 of the Labor Code;
  - (iii) Failure of the Contractor to make payments properly for labor, materials, equipment, or other facilities, or to Subcontractors and/or suppliers;
  - (iv) A reasonable doubt that the Work can be completed for the balance then unearned;
  - (v) A reasonable doubt that the Contractor will complete the Work within the agreed time limits;
  - (vi) Costs to the OWNER resulting from failure of the Contractor to complete the Work within the proper time; or
  - (vii) Damage to Work or property.
  - (viii) Damage to another Contractor.
  - (ix) Performance of Work in violation of the Terms of the Contract Documents.
  - (x) Where Work on unit items is substantially complete, but lacks cleanup and/or other corrections ordered by the Owner's Representative, amounts shall be deducted from the unit prices in partial payment estimates to amply cover such cleanup and correction.
  - (xi) Failure to file required Equal Opportunity and Affirmative Action forms.
- b) Whenever the OWNER shall, in accordance herewith, withhold any monies otherwise due the Contractor, written notice of the amount withheld and the reasons therefore will be given the Contractor. After the Contractor has corrected the enumerated deficiencies, the OWNER will promptly pay to the Contractor the amount so withheld. When monies are withheld to protect the OWNER against claims or liens of mechanics, material men, Subcontractors, etc., the OWNER may at its discretion permit the Contractor to deliver a surety bond in terms and amount satisfactory to the OWNER, indemnifying the OWNER against any loss or expense, and upon acceptance thereof by the OWNER, the OWNER shall release to the Contractor monies so withheld.

**B-73 Waiver of Interest**

The OWNER shall have no obligation to pay and the Contractor hereby waives the right to recover interest with regard to monies which the OWNER is required to withhold by reason of judgment, order, statute or judicial process.





**B-74 Satisfaction of Claims and Liens**

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the OWNER, a complete release of all liens and claims arising out of this Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien or claim could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner's Representative, to indemnify the OWNER against any lien or claim. If any lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the OWNER all monies that the latter may be compelled to pay in discharging such a lien, or claim, including all costs and reasonable attorney's fees.

SECTION 00 01 07

SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

<p>Civil Engineer: GHD Inc. Nathan Stevens, PE</p> 	<p>Structural Engineer: GHD Inc. Gonzalo Cervantes, PE</p> 
<p>Electrical Engineer: GHD Inc. Erick Osorno, PE</p> 	<p>Mechanical Engineer: GHD Inc. Terry Wong, PE</p> 

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. General:

1. The Contract Documents describe the Work to be performed under this Contract which includes, but is not limited to, furnishing all tools, equipment, materials, supplies, and manufactured articles for the Project. It shall also include the furnishing of all transportation and services, including fuel, power, water, and essential communications necessary for the performance of all labor, work, or other operations required for the performance of the Contract in accordance with the Contract Documents.
2. The Contractor should carefully review all sections of the Specifications in order to completely understand the work and all constraints including schedule, environmental and material requirements.
3. All Work is to be constructed in strict accordance with the Contract Drawings and Specifications and subject to the terms and conditions of the Contract.

B. Location of the work:

- a. Roy Lift Station: Located at the intersection of Humboldt Rd. and Roy Ave. in Crescent City, CA.
  - 1) Coordinates: 41.744779, -124.156609

C. Permits:

1. The Contractor shall obtain all necessary permits and comply with them and all other applicable local, state, and federal laws and regulations.

D. Contractor's duties:

1. Except as specifically noted, provide and pay for:
  - a. Labor, materials and equipment.
  - b. Tools, construction equipment and machinery.
  - c. Water, and utilities required for construction.
  - d. All other facilities and services necessary for proper execution and completion of work.
2. Pay legally required sales, consumer and use taxes.
3. Conform to the requirements of applicable permits. pay for, as necessary for proper execution and completion of the work, applicable permits and licenses.
4. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of the work.
5. Promptly submit written notice to Owner of observed variance of Contract Documents from legal requirements.
6. If any subcontractor or person employed by the Contractor shall appear to the Owner to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the requisition of the Owner, and such person shall not again be employed on the work.

7. The Contractor shall obtain their own disposal site for excess soils from excavation, replaced materials, and other debris. Prior to the use of disposal sites the Contractor must submit a signed statement from the property owner granting permission to dispose of materials and holding the Owner harmless from any and all damages that may result from the disposal of materials.
8. The Contractor is responsible for providing construction staking and surveying as required for the job.

E. All equipment shall be maintained in proper working order, including proper muffling.

## 1.2 CONTRACT DESCRIPTION

### A. Description:

1. The Contractor is advised to carefully review all sections of the Specifications in order to completely understand the Work and all constraints including the schedule and material requirements. The Work generally includes but is not limited to minor demolition, site preparation and grading, concrete pad construction, utility installation, installation of a new fixed-position propane generator, installation of a new propane tank, installation of a new generator enclosure, installation of miscellaneous electrical hardware switches and wiring, electrical panels, and installation of security fencing as shown on the Plans and described in these Specifications. Confined space entry is required as part of this contract.
2. All Work is contained in this Contract. The limits of Work are shown in the Contract Drawings and described in these Specifications. It will be the Contractor's responsibility to locate utilities and coordinate their activities to resolve conflicts.
3. Perform Work of Contract under fixed cost contract with the Owner in accordance with General Conditions of Contract.
4. All risk of loss, damage or diminution to the Work shall rest with Contractor until final acceptance of the Work by the Owner.
5. The County has procured the generator and transfer switch. No Air Quality Permit required. The Contractor is responsible for moving the County-supplied equipment from the County's yard to the project site.
6. Contractor shall supply all additional materials required for a complete and functional system.

## 1.3 Work Sequence and Constraints

### A. General:

1. Work under this Contract involves:
  - a. Installation of a 45-kW fixed-position propane generator. Work includes all clearing, grubbing, and vegetation trimming as required at the site.
  - b. Installation of concrete generator pad.
  - c. Installation of miscellaneous electrical hardware, wiring, and switches.
  - d. Demolition of various onsite facilities including electrical equipment, security fencing, engines, and outdated equipment as shown on the drawings.
  - e. Associated site grading, site surface improvements including gravel base surfacing, concrete pavement, driveway installation, precast concrete vaults, drainage improvements, security fencing and site restoration.

2. The Contractor shall note that only certain constraints are addressed in this section. All work, whether or not addressed here, shall be governed by applicable parts of this section, and schedules and procedures further submitted for approval.
3. Changes to existing utilities or any new connection thereto must be coordinated with the Owner and utility providers to provide the least possible interference with site and utility operation. A written cutover plan must be approved by the Owner. Prior to any planned Work all materials, fittings, supports, equipment and tools shall be on the site and all necessary labor scheduled prior to starting any connection Work.
4. The Contractor will be required to coordinate their schedule with the Owner's personnel, to the extent practicable, to ensure a minimum of interruption to the operation of services.
5. No utility shall be disconnected without prior written approval from the Owner. When it is necessary to disconnect a utility, the Contractor shall give at least one weeks written notice to the Owner for approval of the proposed schedule.

**B. Specific Sequence and Constraints:**

1. The Contractor shall provide submittals to the Owner for approval.
2. The Contractor shall include all Work described in this section in the construction schedule. The sequence and constraints identified in this section shall be followed in the construction of the Work. However, alternatives to these sequences and constraints may be submitted by the Contractor for review by the Owner.
3. Specific Sequencing constraints include:
  - a. The pre-construction conference described in this Section shall be coordinated to accommodate attendance by representatives of the Owner.
  - b. Contractor shall notify the Owner of any construction activity that may affect traffic and potentially impact emergency vehicle and fire apparatus access. Additionally, Contractor shall notify Crescent City Fire and Rescue of any fire and life safety concerns.
  - c. Stockpiling of excavated soil that is potentially contaminated is not allowed. Contractor to remove contaminated material from the site and dispose of it at an approved disposal site.
  - d. All new utilities must be tested by the Contractor and accepted by the Owner before they can be put into service, connections between new and existing facilities can be made, and old facilities can be abandoned.
  - e. Existing Owner lift stations & electrical facilities will remain in operation during the duration of the Work. It is the responsibility of the Contractor to repair any damage to the existing infrastructure that may result of construction activities. Contractor shall test existing pump motors for defects prior to connection of new equipment by megger.
  - f. Contractor shall maintain vehicular and pedestrian access at all times throughout the project duration.

**1.4 CONTRACT METHOD**

- A. The Work of this Contract is a lump sum Contract.**

- B. The Contractor shall include the requirements of the General Conditions of the Contract as a part of all of its subcontract agreements.

#### 1.5 UNDERGROUND FACILITIES

- A. The contractor shall notify the Owner and Underground Service Alert (USA) at least 72 hours in advance of any planned excavation (800 642 2444).
- B. The Contractor shall exercise care in all excavations to avoid damage to existing underground facilities. This shall include potholing and hand digging in those areas where underground facilities are known to exist until they have been sufficiently located to avoid damage to the facilities.
- C. Prior to fabrication of any materials, the Contractor shall verify the locations and elevations of existing underground facilities which the Contractor is connecting to.
- D. The Contractor shall exercise care in maintaining those appurtenances to be abandoned and/or removed which are required for the continuing operation of the existing facilities until such time as they can be abandoned. The Contractor shall exercise extreme caution in working in any area adjacent to existing underground pipes. It is essential that the existing utilities be maintained in service until the new Work is ready for full-time operation and is placed in service.
- E. No additional compensation shall be provided to the Contractor for compliance with the provisions of this section for the damage and repair of such facilities due to the lack of care.

#### 1.6 PROJECT MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Preconstruction Meeting, Progress Meetings, and Pre-Installation Meetings.

#### 1.7 CONTRACTOR USE OF PREMISES

- A. Construction is limited to the easements and property belonging to Owner as shown on the Contract Drawings. Contractor to coordinate with Owner for access onto private properties, if such work is required. A letter signed by the land owner permitting the Contractor to do the Work on his or her property shall be provided to the Contractor prior to any work conducted.
- B. Construction and storage areas are limited to the space available at or near the site.
  - 1. During the pre-bid conference, the Owner will detail the available areas that can be used by the contractor during the project. See Temporary Facilities and Controls. Nothing is guaranteed by the County.
- C. Confine operations at site to areas permitted by:
  - 1. Contract Documents
- D. Do not encumber site with materials or equipment beyond those required to complete the work.

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- E. Do not load structure or roadway with weight that will endanger or render unusable any structures or roadways.
- F. Assume full responsibility for protection and safekeeping of products stored on premises.
- G. Obtain and pay for use of additional storage or work area needed for operations.
- H. Return all surface areas to their original condition upon completion of the work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Schedule of Values.
  - 2. Applications for Payment.
  - 3. Contract Modification Procedures.
  - 4. Bid Schedule

1.2 SCHEDULE OF VALUES

- A. The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional work or credits which may arise during construction. Quantities and unit prices may be included in the Schedule of Values when approved by or required by the Owner.
- B. Submit the Schedule of Values within 15 days after the date of the Notice to Proceed and prior to the first Application for Payment. Submit the Schedule of Values on Contractor's electronic media driven form.
- C. The schedule shall be properly proportioned. The sum of individual values shown on the Schedule of Values shall equal the total for each item bid as well as the total Contract Price.
- D. Format: List, as a separate line item, the installed value of each major item of the Work and each subcontracted item of the Work. For each major Subcontractor, list, as separate line items, products and operations of that subcontract. Correlate listings with progress schedule. For items on which payments will be requested for stored products, list sub-values for cost of purchase and delivery of stored products.
- E. Include within each line item a direct proportional amount of Contractor's overhead and profit.
- F. Submit clarifications, if required, within seven (7) calendar days upon receipt of the Owner's comments.
- G. Upon request by the Owner, submit supporting documentation to substantiate the correctness of the schedule submitted.
- H. Revise the Schedule of Values to list approved Change Orders, with each Application for Payment.
- I. Maximum for any single line item in the schedule of values shall be \$50,000.

### 1.3 APPLICATIONS FOR PAYMENT

- A. Submit each Application for Payment on the form approved by Owner.
- B. Submit one signed original of each Application for Payment.
- C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed.
- D. List each authorized Change Order on the Application for Payment, listing Change Order number and dollar amount as for an original item of the Work.
- E. Prepare Application for Final Payment as specified in Section 01 70 00.
- F. Submit an updated progress schedule with each Application for Payment.
- G. Payment Period:
  - 1. Submit at intervals stipulated in the General Conditions: Progress Estimate and Progress Payment.
- H. Submit releases and waivers as stipulated in the General Conditions.
- I. When the Owner requires substantiating information, submit data justifying dollar amounts in question.

### 1.4 CONTRACT MODIFICATION PROCEDURES

- A. Changes in the Work or the requirement for extra work will be made by the Owner in accordance with the General Conditions and with the change procedures as specified herein.
- B. Field Order: The Owner will advise of minor changes in the Work not involving an adjustment to the Contract Price or the Contract Times as authorized by the General Conditions by issuing supplemental instructions in the form of a Field Order. Promptly execute such minor changes and supplemental instructions.
- C. Request for Quotation: The Owner may issue a Request for Quotation, which includes a detailed description of a proposed change with supplementary or revised information, Drawings, and Specifications, and schedule for executing the change in the Work. Prepare and submit a written itemized cost estimate of changes in the Contract Price and/or the Contract Times that would result from the proposed change in the Work by the due date stipulated in the Request for Quotation.
- D. Documentation of Change in Contract Price and Contract Times:
  - 1. Maintain detailed records of work done on a time and material or Force Account Basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
  - 2. Document each quotation for a change in Contract Price and/or Contract Times with sufficient data to allow evaluation of the quotation by the Owner. Each quotation for a change must be approved by the Owner prior to Contractor proceeding with Work associated with the quotation. Allow sufficient time for the

- Owner to review the quotation, without adversely affecting efficiency or production of Work in progress.
3. On request, provide additional data to support computations including:
    - a. Quantities of products, labor, and equipment.
    - b. Taxes, insurance, and bonds.
    - c. Overhead and profit.
    - d. Justification for any change in the Contract Times.
    - e. Credit for deletions from the Contract, similarly documented.
  - E. Support each claim for additional costs, and for work done on a time and material or Force Account Basis, with additional information including:
    1. Origin and date of claim.
    2. Dates and times work was performed, and by whom.
    3. Time records and wage rates paid.
    4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
  - F. Contractor may propose a change by submitting a request for change to the Owner, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Price and Contract Times with full documentation (including itemization of costs for labor, material, taxes, subcontracts, bonds, insurance, and overhead and profit) and a statement describing the effect on the Work by Other Contractors, if any.
  - G. Work Change Directive: The Owner may issue a document, signed by Owner, instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The document will describe changes in the Work, and will designate method of determining any change in the Contract Price or the Contract Times. Promptly execute the change in the Work.
  - H. Lump Sum Price Change Order: Based on Request for Quotation and Contractor's fixed lump sum price quotation or Contractor's request for a Change Order as approved by the Owner.
  - I. Unit Price Change Order: Based on Request for Quotation and Contractor's fixed unit price quotation and estimated quantities or Contractor's request for a Change Order as approved by the Owner.
  - J. Time and Material or Force Account Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Contract Documents. The Owner will determine the change allowable in the Contract Price and the Contract Times as provided in the Contract Documents. Maintain detailed records of work done on a time and material or Force Account Basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
  - K. The Owner will issue Change Orders for signatures of parties as provided in the Contract Documents.

- L. Promptly revise progress schedules to reflect any approved change in the Contract Times (or Milestones), revise sub-schedules to adjust times for other items of work affected by the change, and promptly resubmit to the Owner.
- M. Promptly enter changes in the Project record documents.
- N. Promptly revise Applications for Payment forms and the Schedule of Values to record each authorized Change Order as a separate line item and adjust the Contract Price.

## 1.5 BID SCHEDULE

### BASE BID ITEMS

#### Item 1 – Mobilization/ Demobilization

Measurement for this item shall be on a lump sum basis. This Work covers all Contractor costs and effort associated with mobilizing equipment, materials, and labor to the project site as well as demobilization of the same. Items covered by this include, but are not limited to, bonds, insurance, contracting and administrative costs, costs associated with temporary facilities and utilities, punch list items, repairs of damaged property, site cleanup, project maintenance, and warranty. Additionally, the contractor is responsible for offloading of the generator.

When 10 percent of the total original Contract amount is earned from bid items, excluding amounts paid for materials on hand, 90 percent of the bid price amount for mobilization, or 10 percent of the total Contract amount, whichever is least, will be paid for mobilization. Upon completion of all Work on the project, payment of the balance of the bid amount for mobilization will be paid.

#### Item 2 – Improvements at Roy Lift Station Site

Measurement and payment for this item shall be on a lump sum basis and includes, but is not necessarily limited to site clearing, grubbing, vegetation removal, demolition, layout, excavation and site preparation, aggregate base and compaction, structural slab with canopy, site fencing and gravel, propane tank, piping, regulator, and slab, combination transfer switch and generator connection, including feeders, interconnections, accessories, conduits, pull boxes, hardware, and mounting, compaction testing, final site grading, seed and straw, debris disposal, and all other work as shown on the drawings, required in the specifications, and as required for a complete operating system. Additionally, contractor is responsible for the propane tank concrete pad, coordination and expenses resulting in the installation of the rented Blue Star Gas propane tank, first fill of the propane tank, and all remaining appurtenances to create a fully functioning system.

Contractor is responsible for testing of existing grounding system and physically verifying existence of neutral to ground bond in service enclosure. If ground system is over 15 Ohms to ground, provide additional ground rod and tie to system with A #4 GEC. If bond is missing, provide #4 bond. Verify no bond is installed in interior panelboard. The cost of bonding and grounding is to be included in the Contractor's bid.

The Owner will furnish Items #1-4 shown in Appendix A (Owner-Furnished Equipment), including the generator and automatic transfer switch. Contractor to coordinate and provide transfer of the Owner-furnished equipment from the County's yard to the project site. Contractor

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shall coordinate and provide installation, connection, startup support, testing, and commissioning of the Owner-furnished equipment as required for a complete and operational system. Contractor shall coordinate with the Owner's generator supplier/manufacturer (Cummins) and shall include all costs associated with manufacturer-authorized startup, testing, and commissioning services (including Item #5 shown in Appendix A) in the bid price.

**ADDITIVE BID ITEMS**

Item A1 – Upgrading from Type 1 Structure (Slab with Canopy) to Type 2 Structure (CMU Building)

Measurement and payment for this item shall be on a lump sum basis and relates to upgrading the building from a Type 1 Structure (structural slab with enclosed chain link fence and Roof) to a Type 2 Structure (structural slab with CMU block building and roof).

Work includes, but is not necessarily limited to, the additional work to install the CMU building, the different materials that may have additional cost, and any and all items as shown in the specs and on the plans.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Field engineering.
- C. Pre-bid meeting.
- D. Preconstruction meeting.
- E. Progress meetings.
- F. Pre-installation meetings.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various sections of Project to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items adjusted later.

1.3 FIELD ENGINEERING

- A. The Contractor will provide construction staking services.
- B. Protect survey control points prior to starting site Work; preserve permanent reference points during construction.
- C. Promptly report to Owner loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- D. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Owner.

1.4 PRE-BID MEETING

- A. Prior to awarding the Contract, a Pre-Bid meeting will occur as established in the Advertisement for Bids. The Pre-Bid meeting may be attended by the Owner representatives, interested Contractors, Project Observer and any other parties requested by the Owner or Engineer.

1.5 PRECONSTRUCTION MEETING

- A. Owner will schedule meeting after Notice of Award.

- B. Prior to the commencement of Work at the site, a Preconstruction meeting will be held at a mutually agreed time and place. The Preconstruction meeting shall be attended by the Owner representatives, Owner's Representative, Resident Engineer, Project Observer, Contractor's Construction Superintendent, Construction Foreman, key subcontractors, and any other parties requested by the Contractor or the Owner's Representative.
- C. Unless previously submitted to the Owner, the Contractor shall submit an electronic copy and bring to the conference one (1) paper copy of each of the following:
  - 1. Draft Construction Schedule.
  - 2. Procurement schedule of major equipment and materials and items requiring long lead time.
  - 3. Shop Drawing/Sample/submittal schedule.
  - 4. Schedule of values (unit price and lump sum price breakdown) for progress payment purposes.
  - 5. Letter of Responsibility designating emergency contacts for the Contractor after business hours.
- D. At the Preconstruction meeting the Owner will provide the Contractor with one (1) electronic set of the Contract Documents. It shall be the Contractor's responsibility to arrange for and pay all costs of additional reproduction required by the Contractor.
- E. The purpose of the meeting is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established.
- F. The Owner's Representative will preside at the Preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.
- G. Agenda:
  - 1. Award of Contract.
  - 2. Notice to Proceed date.
  - 3. Distribution of Contract Documents.
  - 4. Contractor's tentative schedules.
  - 5. Submission of list of Subcontractors, list of products, schedule of values, and progress schedule.
  - 6. Critical work sequencing.
  - 7. Designation of personnel representing parties in Contract, and Owner.
  - 8. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
  - 9. Scheduling.
  - 10. Major equipment deliveries and priorities.
  - 11. Use of premises by Owner and Contractor.
  - 12. Owner's requirements and occupancy.
  - 13. Site and Safety and Contractor's assignments for safety and first aid.
  - 14. Construction facilities and controls provided by Owner.
  - 15. Temporary utilities provided by Owner.
  - 16. Survey and layout.

17. Security and housekeeping procedures.
18. Application for payment procedures.
19. Procedures for testing.
20. Procedures for maintaining record documents.
21. Requirements for start-up of equipment.
22. Inspection and acceptance of equipment put into service during construction period.

## 1.6 PROGRESS MEETINGS

- A. The Owner shall schedule, arrange and conduct progress meetings. These meetings shall be conducted once per week, or as mutually agreed by Contractor and Owner, and shall be attended by the Contractor's superintendent and representatives of all subcontractors, utilities, and others, who are active in the execution of the Work. The purpose of these meetings shall be to review the Contractor's schedule provided in accordance with this Section, resolve conflicts, and in general, coordinate and expedite the execution of the Work.
- B. Owner will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings and record the meeting minutes.
- C. Attendance Required: Job superintendent, major subcontractors and suppliers, Owner, and Owners Representative, as appropriate to agenda topics for each meeting.
- D. Agenda:
  1. Review and acceptance of minutes of previous meeting.
  2. Review of Work progress.
  3. Field observations, problems, and decisions.
  4. Site Safety.
  5. Identification of problems impeding planned progress.
  6. Review of submittals schedule and status of submittals.
  7. Review of off-site fabrication and delivery schedules.
  8. Maintenance of progress schedule.
  9. Corrective measures to regain projected schedules.
  10. Planned progress during succeeding work period.
  11. Coordination of projected progress.
  12. Request For Information (RFI).
  13. Request for Additional Work.
  14. Maintenance of quality and work standards.
  15. Effect of proposed changes on progress schedule and coordination.
  16. Progress payments.
  17. Change orders.
  18. Claims.
  19. Other business relating to Work.
- E. Record minutes and distribute copies within two (2) working days after meeting to participants, with one (1) electronic copy each to Owner and those affected by decisions made.

## 1.7 PRE-INSTALLATION MEETINGS

- A. When required in the Contract Documents, convene pre-installation meetings at Project site prior to commencing Work of specific section. Other specific meetings shall be:
  - 1. Cutover plan prior to disconnecting any power sources
  - 2. Testing of the generator under pump load
  - 3. Testing of the transfer switch
  
- B. Require attendance of parties directly affecting, or affected by, Work of specific section.
  
- C. Notify Owner seven (7) working days in advance of meeting date.
  
- D. Prepare agenda and preside at meeting:
  - 1. Review conditions of installation, preparation and installation procedures.
  - 2. Review coordination with related work.
  
- E. Record minutes and distribute copies within two (2) working days after meeting to participants, with one (1) electronic copy each to Owner and those affected by decisions made.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References.
- B. Quality assurance.
- C. Format.
- D. Schedules.
- E. Submittals.
- F. Review and evaluation.
- G. Updating schedules.
- H. Distribution.

1.2 REFERENCES

- A. The Use of CPM (Critical Path Method) in Construction - A Manual for General Contractors and the Construction Industry, Washington, D.C., The Associated General Contractors of America (AGC).

1.3 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel specializing in CPM scheduling of construction work of complexity comparable to this Project and having use of computer facilities capable of delivering graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: Experience in using and monitoring CPM schedules on comparable projects.

1.4 FORMAT

- A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable specification section number.
- B. Diagram Sheet Size: 11 inches high x 17 inches wide.
- C. Scale and Spacing: To allow for notations and revisions.

## 1.5 SCHEDULES

- A. Prepare network analysis diagrams as needed to depict the planned schedule of work.
- B. Illustrate order and interdependence of activities and sequence of work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.
- C. Illustrate complete sequence of construction by activity, identifying work of separate stages. Indicate dates for submittals and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.
- D. Mathematical Analysis: Tabulate each activity of network diagrams, using calendar dates, and identify for each activity relevant information which may include:
  - 1. Preceding and following event numbers.
  - 2. Activity description.
  - 3. Estimated duration of activity, in maximum 15 day intervals.
  - 4. Earliest start date.
  - 5. Earliest finish date.
  - 6. Actual start date.
  - 7. Actual finish date.
  - 8. Latest start date.
  - 9. Latest finish date.
  - 10. Total and free float; accrue float time to Owner and to Owner's benefit.
  - 11. Monetary value of activity, keyed to Schedule of Values.
  - 12. Percentage of activity completed.
  - 13. Responsibility.
- E. Analysis Program: Capable of accepting revised completion dates, and recomputation of scheduled dates and float.
- F. Required Sorts: List activities in sorts or groups as required which may include:
  - 1. By preceding work item or event number from lowest to highest.
  - 2. By longest float, then in order of early start.
  - 3. By responsibility in order of earliest possible start date.
  - 4. In order of latest allowable start dates.
  - 5. In order of latest allowable finish dates.
  - 6. Contractor's periodic payment request sorted by Schedule of Values listings.
  - 7. Listing of basic input data generating report.
  - 8. Listing of activities on critical path.
- G. Coordinate contents with Bid Schedule items in Section 01 20 00 – Price and Payment Procedures.

## 1.6 SUBMITTALS

- A. Within 10 days after date established in Notice to Proceed, submit proposed preliminary network diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.
- B. Participate in review of preliminary and complete network diagrams jointly with Owner.
- C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete graphical schedule for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analysis.
- E. Submit updated network schedules with each Application for Payment.
- F. Submit digitally and two hard copies.
- G. Submit under transmittal letter form specified in Section 01 33 00 - Submittal Procedures.

## 1.7 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of network diagrams and analysis with Owner at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise network diagrams and analysis incorporating results of review, and resubmit within 10 days.

## 1.8 UPDATING SCHEDULES

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Annotate and/or update diagrams to graphically depict current status of Work.
- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Indicate changes required to maintain Contract Date of Completion.
- E. Submit sorts required to support recommended changes.
- F. Prepare narrative report as needed to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect.

1.9 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Engineer, CM and Owner.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 33 00  
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Product data & Shop drawings.
- D. Test reports.
- E. Certificates.

1.2 SUBMITTAL PROCEDURES

- A. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- B. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
- D. Schedule submittals to expedite Project and deliver to Owner/Engineer. Coordinate submission of related items.
- E. For each submittal for review, allow ten (10) calendar days excluding delivery time to and from Contractor.
- F. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.
- G. When revised for resubmission, identify changes made since previous submission.
- H. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedules within ten (10) calendar days after date of Notice to Proceed. After review, resubmit required revised data within ten (10) calendar days.

- B. Submit revised Progress Schedules with each Application for Payment.
- C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Revisions To Schedules:
  - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
  - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

#### 1.4 PRODUCT DATA and shop drawings

- A. Product Data and Shop Drawings: Submit to Owner for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit a single re-producible copy or email an electronic version of the submittal to the Owner.
- C. Mark submittal to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

#### 1.5 TEST REPORTS

- A. Submit for Owner's knowledge as contract administrator.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

#### 1.6 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Owner, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product but must be acceptable to Owner.

**Del Norte County**  
Roy Lift Station Emergency Power Project

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

**SHOP DRAWING/MATERIAL REVIEW REQUEST**

INSTRUCTION: Complete this form and attach to each specific Shop Drawing Submittal.

- 1. Contract Name \_\_\_\_\_
- 2. Submission No. \_\_\_\_\_  
Submittal:    A. New \_\_\_\_\_    B. Resubmittal \_\_\_\_\_
- 5. Date of this submittal \_\_\_\_\_
- 6. Date of receipt by Owner \_\_\_\_\_
- 7. Previous Submission No. (if any) \_\_\_\_\_
- 8. Contractor \_\_\_\_\_
- 9. Submitted by (signature and date) \_\_\_\_\_

10. <u>Item</u>	11. Specification Section and <u>Paragraph Nos.</u>	12. Description of Material (Name, Type, Model, <u>Catalog No., Mfg., Etc.</u> )
_____	_____	_____
_____	_____	_____
_____	_____	_____

- 13. Comment:  
Include all drawing titles and numbers, specific information not on drawings, information coming later, etc.

For Use of Owner Only:

- 14. Action taken\* \_\_\_\_\_
- 15. Review by (signature and date) \_\_\_\_\_

\*See review stamp on individual items.

# SUBMITTAL TRANSMITTAL

**PROJECT:**  
 Del Norte County  
 Roy Lift Station Emergency Power Project

**SPECIFICATIONS SECTION:**  
**SUBMITTAL No.:**  
**DRAWING REF. No.:**  
**SUBCONTRACTOR/SUPPLIER:**  
**DATE:**  
**PAGE No.:** OF  
**CC:**

**CONTRACTOR:**

TRANSMITTAL RECORD	DATE SENT	DATE REC'D	QUANTITY				REVIEW CODES
			REPRO.	PRINT	SAMPLE	MFG. LIT.	
CONTRACTOR TO OWNER'S REP							1 REVIEWED, NO EXCEPTIONS 2 MAKE CORRECTIONS NOTED 3 REVISE AS NOTED, RESUBMIT 4 REJECTED, RESUBMIT AS SPECIFIED 5 CANCELLED
OWNER'S REP TO CONTRACTOR							

REVIEW ACTION:

1	2	3	4	5

DRAWING/ITEM	DATED	DESCRIPTION

<b>OWNER'S REP'S REMARKS:</b>


**NOTE:** NOTATIONS DO NOT AUTHORIZE CHANGES TO CONTRACT SUM OR TIME. IF YOU ARE AUTHORIZED TO PROCEED WITH THE WORK IDENTIFIED IN THIS SUBMITTAL, IT IS ASSUMED THAT NO CHANGE IN THE CONTRACT AMOUNT OR COMPLETION DATE IS REQUIRED. IF A CHANGE IN THE WORK AFFECTING YOUR CONTRACT AMOUNT OR COMPLETION DATE IS INVOLVED, NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY.

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SECTION 01 40 00  
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality control and control of installation
- B. Tolerances
- C. References
- D. Labeling
- E. Testing and Inspection Services
- F. Manufacturers' field services
- G. Examination
- H. Preparation

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. When manufacturers' instructions conflict with Contract Documents, request clarification from Owner before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

- B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Owner before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

#### 1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. When specified reference standards conflict with Contract Documents, request clarification from Owner before proceeding.
- E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Owner shall be altered from Contract Documents by mention or inference otherwise in reference documents.

#### 1.5 LABELING

- A. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
  - 1. Model number.
  - 2. Serial number.
  - 3. Performance characteristics.

#### 1.6 TESTING AND INSPECTION SERVICES

- A. Employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.
  - 1. Before starting Work, submit testing laboratory name, address, and telephone number, and names of full-time Professional Engineer and responsible officer.
  - 2. Submit copy of report of laboratory facilities' inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by the Owner.
  - 1. Laboratory: Authorized to operate in State of California.
  - 2. Laboratory Staff: Maintain full-time Professional Engineer on staff to review services.
  - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.

- C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by the Owner or Engineer.
- D. Reports shall be submitted by independent firm to the Owner, Contractor, and authorities having jurisdiction, in duplicate, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
  - 1. Submit final report indicating correction of Work previously reported as noncompliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
  - 1. Notify Owner and independent firm 24 hours before expected time for operations requiring services.
  - 2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- G. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Owner. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- H. Agency Responsibilities:
  - 1. Test Samples of mixes submitted by Contractor.
  - 2. Provide qualified personnel at Site. Cooperate with Owner and Contractor in performance of services.
  - 3. Perform indicated sampling and testing of products according to specified standards.
  - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
  - 5. Promptly notify Owner and Contractor of observed irregularities or nonconformance of Work or products.
  - 6. Perform additional tests required by Owner.
  - 7. Attend preconstruction meetings and progress meetings as applicable.
- I. Agency Reports: After each test, promptly submit two copies of report to Owner, Contractor, and authorities having jurisdiction. When requested by Owner, provide interpretation of test results. Include the following:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Name of inspector.
  - 4. Date and time of sampling or inspection.
  - 5. Identification of product and Specification Section.
  - 6. Location in Project.
  - 7. Type of inspection or test.
  - 8. Date of test.
  - 9. Results of tests.

10. Conformance with Contract Documents.
11. Limits on Testing Authority:
12. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
13. Agency or laboratory may not approve or accept any portion of the Work.
14. Agency or laboratory may not assume duties of Contractor.
15. Agency or laboratory has no authority to stop the Work.

#### 1.7 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Owner 30 days in advance of required observations. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

#### PART 2 PRODUCTS (NOT USED)

#### PART 3 EXECUTION

##### 3.1 EXAMINATION

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify utility services are available, of correct characteristics, and in correct locations.

#### PART 4 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Public Utilities
  - 1. Agencies Affected.
  - 2. Notification Requirements.
  - 3. Contractor Responsibility.
- B. Temporary Utilities
  - 1. Temporary electricity.
  - 2. Temporary ventilation.
  - 3. Temporary sanitary facilities.
- C. Existing Utilities and Improvements.
  - 1. General
  - 2. Owner Right of Access
  - 3. Underground Utilities Indicated
  - 4. Underground Utilities not Indicated
  - 5. Approval of Repairs
  - 6. Maintain in Service
- D. Temporary Field Office and Storage Facility
  - 1. Contractors and Subcontractors
  - 2. Specific Staging Area
- E. Vehicular Access
- F. Parking
- G. Progress Cleaning and Waste Removal
- H. Barriers
- I. Security
- J. Water Control
- K. Dust Control
- L. Erosion and Sediment Control
- M. Pollution Control
- N. Removal of Utilities Facilities, and Controls.

## 1.2 SUBMITTAL REQUIREMENTS

- A. Section 01 33 00 – “Submittal Procedures”.

## 1.3 PUBLIC UTILITIES

### A. Agencies Affected

1. Electrical: Pacific Power. It should be noted that where a structure is known to receive service does not have overhead service, then underground service shall be assumed to exist.
2. Gas: Blue Star Gas has jurisdiction over gas lines.
3. Telephone and Communications Service: It should be noted that where service to a structure is known and does not have overhead service, then underground service shall be assumed to exist.
4. Water Service: The City of Crescent City has jurisdiction over water usage.
5. Drainage: Del Norte County Community Development Department has jurisdiction over drainage in the area.
6. Sewer Service: Del Norte County Service Area No. 1

### B. Notification Requirements

1. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, or other pipelines; all buried electric power, communications, or television cables; the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than three (3) working days nor more than seven (7) work days prior to excavation.
2. Notify USA at (800) 642-2444 at least three (3) work days, but no more than fourteen (14) work days, prior to such excavation.

### C. Contractor Responsibility

1. The Contractor shall anticipate water, sewer, electrical, gas, communication, drainage and telephone services. It may be expected that there will be variation in location from that as shown on the Contract Drawings to the actual location. Contractor responsible for verifying actual location in the field after pre-marking by the various utilities affected.
2. No extra payment will be allowed for the removal, replacement, repair, or possible increased cost caused by inadvertent or planned interception and breaking of underground obstructions which may exist.
3. It should be understood that the various known utilities are indicated on the Contract Drawings to show only the approximate location and must be verified in the field by the Contractor. The various utility agencies will cooperate with the Contractor to endeavor to familiarize him with all known underground utilities obstructions, but this will not relieve the Contractor from full responsibility in anticipating and locating their actual location.
4. The Contractor, in conjunction with the affected utility company(s), shall pothole and establish the horizontal and vertical location of all utilities shown on the Contract Drawings and marked in the field. This may be done on an area-by-area basis, but shall be accomplished at least five (5) working days in advance of the date of construction within such area. Any discrepancies (horizontal and/or vertical) between the location of a utility found by the potholing operation and that

shown on the Contract Drawings shall be brought to the Owner's attention immediately. Potholing shall be required at the connection to existing facilities prior to the shop drawing submittals.

#### 1.4 TEMPORARY UTILITIES

##### A. Electricity

1. Provide and pay for power service required from utility source or from portable generators as needed for construction operation.
2. Provide temporary electric feeder from existing electrical service if required. Coordinate location with the Owner. Do not disrupt Owner's use of service.
3. Complement existing power service capacity and characteristics as required for construction operations.
4. Provide power outlets, with branch wiring and distribution boxes located as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.
5. Provide main service disconnect and over-current protection at convenient location.
6. Contractor is responsible for all necessary permits, permissions, codes and regulatory compliance associated with such use.

##### B. Temporary Ventilation

1. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

##### C. Temporary Sanitary Facilities

1. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of project mobilization.
2. Contractor is responsible for cleaning, maintenance, security, placement and removal of facilities.

##### D. Temporary Water

1. Coordinate temporary water with City of Crescent City. All water use to be metered and paid for by the contractor.

#### 1.5 EXISTING UTILITIES AND IMPROVEMENTS

##### A. General

1. The Contractor shall protect all underground utilities and other improvements that may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary. Any damage to utilities not marked or marked in incorrect locations should be resolved between the Contractor and the utility company that did not mark the location of the utility correctly.

2. In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the contractor, be notified by the Owner. Time of relocation of the utility by the utility company is not a responsibility of the Owner. When utility lines to be removed are encountered within the area of operation, the Contractor shall notify the Owner, a sufficient time in advance, for the necessary measures to be taken to prevent interruption of service.
3. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement that is indicated, the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Owner's Engineer and the Owner. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former location and to equal or better condition as found prior to removal.

**B. Owner Right of Access**

1. The right is reserved to the Owner and to the owners of public utilities to enter at any time upon any public street, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.

**C. Underground Utilities Indicated**

1. Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling, and if damaged, shall be immediately repaired or replaced by the Contractor.

**D. Underground Utilities not indicated**

1. In the event that the Contractor damages any existing utility lines that are not indicated or the locations of which are not made known to the Contractor prior to excavation, a written report there-of shall be made by the Contractor to the Owner. Contractor to coordinate repair with utility owner.

**E. Approval of Repairs**

1. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement Owner before being concealed by backfill or other Work. Contractor to schedule with Owner for the inspection.

**F. Maintain In Service**

1. All power and telephone or the communication cable ducts, gas and water mains, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the Owner of said pipelines, duct, main, sewer, storm drain, pole, conduit, wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this section shall not be abated even in the event such damage

occurs after backfilling or is not discovered until after completion of the backfilling.

#### 1.6 TEMPORARY FIELD OFFICE AND STORAGE FACILITY

##### A. Contractor and Subcontractors:

1. The Contractor and their Subcontractors shall make arrangements for and maintain such office and storage facilities as may be necessary for the proper conduct of the Work. These shall be located so as to cause no interference with any Work to be performed on the site. Coordination and location of offices or storage facilities shall be the responsibility of the Contractor.

##### B. Staging Areas:

1. 500 East Cooper Ave, Crescent City, CA 95531 – Coordinate with County. 20' x 40' available.
2. Alternate as provided by Contractor.

#### 1.7 VEHICULAR ACCESS

- A. Provide unimpeded access for Owner's vehicles.
- B. Provide means of removing mud from vehicle wheels before entering streets.
- C. Use existing on-site roads for construction traffic.

#### 1.8 PARKING

- A. Arrange for temporary surface parking areas to accommodate construction personnel.
- B. When site space is not adequate, provide additional off-site parking.
- C. Use of designated existing on-site streets and driveways used for construction traffic is permitted. Tracked vehicles are only allowed in project area, as necessary for performance of the work. All damage caused to pavement by said vehicles shall be repaved and restored at Contractor's expense to a condition at least equal to the existing condition prior to construction.
- D. Maintenance
  1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, and mud.
  2. Maintain existing areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain surface course and drainage in original, or specified, condition.
- E. Removal, Repair
  1. Remove temporary materials and construction at Substantial Completion.
  2. Repair existing facilities damaged by use, to original condition.
- F. Mud From Site Vehicles
  1. Provide means of removing mud from vehicle wheels before entering streets.

### 1.9 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, and other closed or remote spaces, prior to enclosing spaces.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site at an approved disposal site. Refer to Section 01 74 00 – “Cleaning and Waste Management”.

### 1.10 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

### 1.11 SECURITY

- A. Security Program
  - 1. Protect Work, existing premises and Owner’s operations from theft, vandalism, and unauthorized entry.
  - 2. Initiate program in coordination with Owner’s existing security system at project mobilization.
  - 3. Maintain program throughout construction period until Owner acceptance precludes need for Contractor security.
- B. Entry Control
  - 1. Restrict entrance of persons and vehicles into Work site.
  - 2. Owner will control entrance of persons and vehicles related to Owner’s operations.

### 1.12 WATER CONTROL

- A. Grade Site to Drain
  - 1. Maintain excavations free of water.
  - 2. Provide, operate, and maintain pumping equipment as necessary to control water.

### 1.13 DUST CONTROL

- A. See Section 01 57 00 “Temporary Controls” of these specifications.

1.14 EROSION AND SEDIMENT CONTROL

- A. See Section 01 57 00 "Temporary Controls" of these specifications.

1.15 POLLUTION CONTROL

- A. See Section 01 57 00 "Temporary Controls" of these specifications.

1.16 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 55 26

TRAFFIC CONTROL

PART 1 GENERAL

1.1 THE REQUIREMENT

- A. The Contractor shall provide all materials, equipment, and labor necessary to furnish, place, and maintain all temporary traffic control systems, including construction and maintenance area traffic control devices and flaggers as required to perform the Work in accordance with this Section, and all other appurtenant Work, complete in place, as shown on the Contract Drawings and as specified herein.
- B. Work Specified in this Section
  - 1. Review of proposed Work areas to determine temporary traffic control requirements.
  - 2. Verification of temporary traffic controls with the Owner's Representative prior to implementation.
  - 3. Maintenance of traffic control during the Work.
  - 4. Monitoring traffic control during the Work to determine necessary changes required to maintain adequacy.
  - 5. Maintenance of traffic control during non-work hours to maintain adequacy.
  - 6. Removal of temporary traffic control systems after completion of the Work.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. General Provisions, Section B-51 – Public Convenience.
- B. State of California, Department of Transportation (Caltrans) Specifications and Standards
  - 1. Standard Specifications
    - a. Section 7 Legal Relations and Responsibility
    - b. Section 12 Construction Area Traffic Control Devices
  - 2. Standard Plans
    - a. Temporary Traffic Control Systems
  - 3. California Manual on Uniform Traffic Control Devices, Current Edition (California MUTCD)
- C. Commercial Standards
  - 1. State of California, Division of Industrial Safety, Department of Industrial Relations.
  - 2. Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California, current edition.

### 1.3 CONTRACTOR SUBMITTALS

- A. In addition to the submittal requirements of Section 01 33 00 "Submittal Procedures," the Contractor shall provide the following at least 10 working days prior to work on site and shall meet with the approval of the Owner:
1. The Contractor shall submit for review by the Owner, a Work Zone Traffic Control Plan on 11" x 17" format which contains only information specifically related to work zone traffic control, including pedestrian traffic control. It is acceptable to utilize standard Caltrans Temporary Traffic Control Systems Drawings. The plan will show which California MUTCD typical applications are to be used for each work operation in addition to site specific traffic control. If the Contractor proposed to use the current edition of California MUTCD in specific work operations, they shall submit in writing for consideration which Typical Application Diagram will be used for each work operation. The Work Zone Traffic Control Plan shall be specific to the proposed method of pipeline construction (open trench or horizontal directional drill), and shall include:
    - a. Specific details for construction staging, including the location and limits of the work zone.
    - b. Identification of changeable message board locations. A minimum of 2 changeable message boards and 2 arrow boards shall be required.
    - c. Locations of all excavations.
    - d. American's with Disabilities Act (ADA) compliant pedestrian routing plans and details showing how pedestrians will be routed through the work area.
    - e. Plans for protection of the public from construction-related hazards.
    - f. Lane closures and traffic routing including consideration of construction-related trucking routes.
    - g. A trucking route for approval by the Owner. The route must minimize traffic on residential streets that are not part of the project.
    - h. Lane closure markings, barricade locations, and sign locations showing the necessary signing, methods of delineation and channelization and reference to the appropriate Caltrans standards and California MUTCD details for all affected roads.
    - i. Dimensions of lanes affected by traffic control that will be open to traffic.
    - j. Dimensions and locations of signs and cone tapers.
    - k. Identification of side streets and driveways affected by construction and show how they will be handled.
    - l. Detail of how public transit will be handled through the construction area.
    - m. Time periods of lane closures and detours.
  2. The Work Zone Traffic Control Plan shall contain a title block which contains the Contractor's name, address, phone number, project superintendent's name, contract name, dates and hours traffic control will be in effect, and a space for review acknowledgment.
  3. The Work Zone Traffic Control Plan shall be prepared by a licensed California Civil or Traffic Engineer. The Work Zone Traffic Control Plan shall be submitted to the Owner and other affected agencies for review at least two weeks prior to implementation in order to determine the Contractor's compliance with the requirements of this section.
  4. No work except for installation of project identification signs will be allowed to commence prior to approval of the Work Zone Traffic Control Plan.

5. A "Letter of Responsibility," on company letterhead, indicating the names and telephone numbers of at least three different persons who shall be available to be contacted in case of emergency at any time during the life of the contract. Said persons must have decision-making authority within the company.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. All construction area stationary and portable sign panels, lights, barricades, and traffic control devices shall be the product of a commercial sign or safety device manufacturer conforming to the requirements of Section 12, "Construction Area Traffic Control Devices," of the Caltrans Standard Specifications, unless otherwise specified in this Section, shown on the Drawings, and/or as directed by the Owner.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. No work shall commence until traffic control signing has been approved by the Owner.
- B. The Contractor shall provide all appropriate traffic control measures in accordance with this Section prior to start of construction in the public right-of-way or in any area adjacent to the street right of way where public safety is affected.
- C. The Contractor shall take all necessary precautions for the protection of the Work and the safety of its employees and the public. Traffic shall be maintained through the construction or maintenance zone in accordance with Sections 7-1.08, 7-1.09 and 12 of the Caltrans Standard Specifications and Sections 01 11 00 "Summary of Work."
- D. Field changes to traffic control plans shall be approved by the Owner prior to installation.
- E. When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Owner.
- F. All construction area signs, lights, barricades, and traffic control devices shall be furnished, installed, maintained, and removed in conformance with the latest edition of the California MUTCD. Additional or alternate signs may only be used when specifically authorized by the Owner.
- G. The Contractor shall monitor traffic and safety conditions and maintain adequate traffic control measures during both work and non-work hours in order to maintain compliance with the requirements of this Section.

- H. The Contractor shall conform to all requirements of the current "Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California."
- I. If a hazardous condition is observed and the Owner notifies the Contractor either directly or by telephone, the Contractor shall correct the condition immediately. If the Contractor fails to correct the hazardous condition immediately, the Owner reserves the right to call in a local contractor to perform the necessary work needed to improve public safety. The cost incurred shall be billed to the Contractor. Should the Owner point out any inadequacy of warning and protective measures, such action on the part of the Owner shall not relieve the Contractor from responsibility for public safety nor abrogate his obligation to furnish and pay for these devices.
- J. All construction area signs, lights, barricades, and temporary traffic control devices shall be completely removed from the roadway when not in use. Locations and methods of storing traffic control equipment adjacent to the roadway between interrupted use shall require prior approval of the Owner.
- K. The Contractor shall completely remove all temporary signs, striping and/or delineators and restore the pavement, as necessary, upon removal or relocation of any temporary traffic controls or detours constructed as part of the Work.
- L. Temporary traffic control measures shall be in effect only during Work hours. Normal traffic routing shall be reestablished at the end of each workday.
- M. Contractor shall conduct his operation as to offer the least possible obstruction and inconvenience to the public, and he shall have under construction no greater amount of Work than he can prosecute properly with due respect to the rights of the public. Contractor shall provide personal advance notice to each affected resident or business informing him of impending work and provide ample time to remove vehicles and estimated time of driveway closure. This shall be accomplished by delivering a notice to all houses or businesses to be affected by the impending work. The notice shall be typed and signed by the contractor or his designated superintendent. The format and contents of the notice shall be approved by the Owner prior to commencement of the Work.
- N. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses, and buildings along the line of the work shall be maintained, and temporary approaches to crossings or intersecting roads shall be provided and kept in good condition.
- O. Whenever the Contractor's operations create a condition hazardous to the public, furnish, erect, and maintain such fences, barricades, lights, signs and other devices as are necessary to prevent accidents or damage or injury to the public.
- P. Should the Contractor appear to be neglectful or negligent in furnishing warning and protective measures as above specified, the Owner may direct attention to the existence of hazard, and the necessary warning and protective measures shall be furnished and installed by the Contractor at his expense, without cost to the Owner.

Should the Owner point out any inadequacy of warning and protective measures, such action on the part of the Owner shall not relieve the Contractor from responsibility for public safety nor abrogate his obligation to furnish and pay for these devices.

- Q. Under no circumstances shall access to businesses or residences be held up more than 30 minutes at any one time. The Contractor may coordinate with property and business owners to schedule work so that longer delays do not adversely affect residents or business owners to their satisfaction. In addition, Contractor shall give personal notice to all affected property owners as specified in paragraph M, hereinbefore. Before closing any street to through traffic, Contractor shall obtain prior approval from the Owner seven (7) days in advance of closure. Contractor shall at all times provide access to public facilities such as schools, etc. and make provisions for passage of emergency vehicles.
- R. No road closures are allowed. The Contractor shall keep the County of Del Norte informed regarding traffic control operations. The Contractor shall call the Crescent City Fire and inform the local businesses before and after any single lane closures on multiple lane local streets within the County or Caltrans right-of-way traffic control activities. This requirement applies immediately upon lane closure for that day and again immediately after removal of the lane closure.

### 3.2 PEDESTRIAN TRAFFIC

- A. The Contractor is directed to Chapter 6D, Pedestrian and Worker Safety, in the California MUTCD, the Drawings, and these Specifications.
- B. Pedestrians shall be provided with a safe, convenient and accessible path that, at a minimum, replicates the most desirable characteristics of the existing sidewalk, path or footpath.
- C. The Contractor shall construct and maintain temporary pedestrian pathways through the work zone, where required, that shall be in compliance with the requirements of the Americans with Disabilities Act (ADA) and the California MUTCD.
- D. Pedestrian routes shall not be impacted for the purposes of any non-construction activities such as parking of vehicles or equipment, or stock piling of materials.
- E. Pedestrians shall not be led into conflicts with work site vehicles, equipment or operations.

END OF SECTION

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SECTION 01 57 00  
TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes mitigation and project measures to reduce or avoid adverse effects, resulting from construction of the generators and housing, to the following environmental factors:
  - 1. Air Quality
  - 2. Human Remains
  - 3. Erosion Control
  - 4. Construction Dewatering
  - 5. Noise Reduction Measures
  - 6. Cultural Resources
  - 7. Geology and Soil
  - 8. Fire Safety
  - 9. Hydrology
  - 10. Traffic
  
- B. Related Sections
  - 1. Section 01 50 00 – Temporary Facilities and Controls
  - 2. Section 01 74 00 – Cleaning and Waste Management
  - 3. Section 02 00 00 – Existing Conditions
  - 4. Section 31 23 19 – Dewatering
  - 5. Section 31 25 13 – Erosion and Sedimentation Controls

1.2 DEFINITIONS

- A. Project Measures: measures and practices are included as part of the Project to reduce or avoid adverse effects that could result from construction.

1.3 SUBMITTALS

- A. Erosion Control Plan
- B. Dewatering Plan
- C. Work Zone Traffic Control Plan

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- A. PROJECT MEASURES:

1. Air Quality. Implement Air Quality Emission Control Measures during Construction. The principal concern about the effect of construction projects on air quality relates to the potential for earthwork and other activities to generate dust, including inhalable particulate matter (PM10) that poses a human health hazard. To address the potential for dust generation, the Contractor will be required to implement the following BMPs:
  - a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered as necessary during dusty conditions.
  - b. If loose material becomes airborne during transportation, all haul trucks transporting soil, sand, or other loose material off-site will be covered.
  - c. Disturbed roadways will be re-paved as soon as possible following work in the area, as appropriate.
  - d. All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers, as necessary. The use of dry power sweeping is prohibited.
  - e. Idling times will be minimized by shutting equipment off when not in use.
  - f. All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications.
  - g. Refer to Section 01 50 00 "Temporary Facilities and Controls" for additional BMP's and requirements.
2. Procedures regarding Encountering Human Remains. Human remains may be encountered, given the reported presence of prehistoric sites in the vicinity. If human graves or remains are encountered, the following measures shall be implemented:
  - a. The Contractor will halt the work in the vicinity.
  - b. The County Coroner will be notified. At the same time, a qualified archaeologist will be contacted to evaluate the situation.
  - c. The Owner shall be notified.
  - d. If human remains are of Native American origin, the Coroner will notify the Native American Heritage Commission within 24 hours of identification (Ph: (916) 653 – 4082 Email: nahc@pacbell.net).
3. Erosion Control. The following erosion control measures shall be implemented by the construction contractor to prevent soil erosion and sedimentation during construction. Erosion and sediment control measures will be in effect and maintained by the contractor on a year-round basis until all disturbed areas are stabilized.
  - a. Stockpiled material will be covered or watered to eliminate excessive dust, as necessary.
  - b. Fiber rolls or similar products will be utilized in appropriate locations to reduce sediment runoff from disturbed soils, as necessary.
  - c. A stabilized construction entrance will be maintained to minimize tracking of mud and dirt from construction vehicles onto public roads.
  - d. Storm drain inlets receiving storm water runoff will be equipped with inlet protection, as necessary.
  - e. A concrete washout area will be designated to clean concrete trucks and tools, if necessary.
  - f. Refer to Section 31 25 13 – "Erosion and Sedimentation Controls" for additional BMP's and requirements.

4. Construction Dewatering. Excavation and below grade work will be scheduled during summer and early fall to coincide with the period of the lowest groundwater levels at the site and the timeframe with the least chance for rainfall. If groundwater is encountered, the contractor, in coordination with the Project Owner will evaluate options for dewatering management. If dewatering is necessary, one or more following management options shall be used by the construction contractor to protect water quality during pumping activities:
  - a. Reuse the water on-site for dust control, compaction, or irrigation, as appropriate.
  - b. Retain the water on-site in a grassy or porous area to allow infiltration/evaporation.
  - c. Discharge (by permit) to a sanitary sewer or storm drain (this option may require a temporary method to filter sediment-laden water prior to discharge). If discharge to a storm drain (i.e., surface waters) is the only feasible option, the Project will comply with Water Board requirements for construction dewatering. Measures may include characterizing the discharge and receiving waters and developing a Best Management Practices Plan including filtering methods and monitoring and reporting requirements.
  - d. Contractor shall submit a dewatering plan as detailed in Section 31 23 19.
5. Noise Reduction Measures. During Project construction, the following measures will be incorporated into the Project to reduce daytime noise impacts to the maximum feasible extent:
  - a. A preconstruction meeting will be held among the Owner construction manager, and the general contractor to confirm that the following noise reduction practices are to be implemented in the appropriate phase of construction.
  - b. Hours of construction will be limited to between 7 AM to 5 PM, Monday through Friday. No construction would be allowed on Saturdays or Sundays, except in an emergency.
  - c. Stationary (including HDD rig) and impact equipment shall be shielded by the placement of straw bales, baffles, or similar sound barriers within 200 feet of any residence. Barriers shall be positioned between the equipment and any such residence such that noise is directed up or away from the residence.
  - d. Quietest available equipment and electrically-powered equipment will be used, rather than internal combustion engines where feasible.
  - e. Equipment and on-site trucks used for Project construction will be equipped with properly functioning noise control devices such as mufflers, shields, and shrouds. All construction equipment will be inspected at periodic intervals to ensure proper maintenance and resulting lower noise levels.
  - f. Impact tools (e.g., jack hammers, pavement breakers, rock drills) used for Project construction will be hydraulically or electrically powered wherever possible to avoid noise associated with compressed-air exhaust from pneumatically powered tools.
6. Cultural Resources.
  - a. Identify and Avoid or Minimize Impacts to Unknown Historic and/or Archaeological Resources. The Contractor shall ensure that if concentrations of prehistoric or historic-period materials are encountered as a result of ground-disturbing activity attributable to the Project, all work in the

immediate vicinity shall halt until a qualified archaeologist can evaluate the finds and make recommendations. The recommendations of the archaeologist shall be implemented. Prehistoric materials could include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scraping implements) or tool-making debris; culturally darkened soil (“midden”) containing heat-affected rocks, shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, milling slabs). Historic materials could include stone or concrete footings and walls; building materials, or other remains with cut nails, artifact-filled wells or privies; and other deposits of metal, glass, and/or ceramic artifacts. If such materials are encountered during construction the Owner shall retain a qualified archaeologist who shall be present during subsequent surface and subsurface activities in the vicinity of the sensitive materials as determined necessary by the archaeologist. With respect to these areas of sensitive materials:

- 1) Ground disturbance shall be monitored by a qualified archaeologist with the authority to temporarily halt work and redirect equipment if cultural materials are discovered.
  - 2) If cultural materials are discovered, the archaeologist shall assess the discovery to determine if it constitutes either a unique archaeological resource or a historical resource for purposes of CEQA (CCR Title 14 §15064.5[a]).
  - 3) If the archaeologist determines that the materials do not constitute either a unique archaeological resource or a historical resource, their presence shall be noted but need not be considered further.
  - 4) If the archaeologist determines: (a) that the materials do constitute a unique archaeological resource or historical resource; and, (b) they are subject to substantial adverse change as defined in CCR Title 14 §15064.5[b], the archaeologist shall provide recommendations to the Owner for appropriate treatment which, among other options, may include preservation in place or archaeological data recovery. Preservation in place is preferred, if it is feasible.
- b. Evaluation and Treatment of Paleontological Resources. If paleontological resources (e.g., vertebrate bones, teeth, or abundant and well-preserved invertebrates or plants), are encountered during construction, work in the immediate vicinity shall be diverted away from the find until a professional paleontologist assesses and salvages the find, as appropriate.
7. Geology and Soils: The Project shall be constructed using the applicable requirements of the California Building Code (CBC), to minimize any geophysical risks associated with construction of the proposed project.
  8. Hydrology and Water Quality
    - 1) At all times during construction activities, the Contractor shall minimize the area disturbed by excavation, grading, or earth moving to prevent the release of excessive fugitive dust. During periods of high winds (i.e. wind speed sufficient that fugitive dust leaves the site) Contractor shall cover or treat areas of exposed soil and active portions of the construction site to prevent fugitive dust.
    - 2) No construction materials, equipment, debris, or waste shall be placed or stored where it may be subject to wave, wind, or rain erosion and dispersion. Material handling on and offsite shall be required to comply

- with California Vehicle Code Sec. 23114 with regard to covering loads to prevent materials spills onto public roads.
- 3) All construction equipment shall be equipped and maintained to meet applicable EPA and CARB emission requirements for the duration of the construction activities.
  - 4) Throughout construction, contractor shall maintain adjacent paved areas free of visible soil, sand or other debris.
  - 5) If stockpiled on or offsite, soil and aggregate materials shall be covered with secured plastic sheeting and runoff shall be diverted around them.
  - 6) Drainage courses, creeks, or catch basins shall be protected with straw bales, silt fences, and/or straw wattles.
  - 7) Storm drain inlets from sediment-laden runoff shall be protected with sand bag barriers, filter fabric fences, straw wattles, block and gravel filters, and excavated drop inlet sediment traps.
  - 8) Vehicle and equipment parking and vehicle maintenance shall be conducted in designated upland areas away from creeks or storm drain inlets,
  - 9) Major maintenance, repair, and washing of vehicles and other equipment shall be conducted offsite or in a designated and controlled area.
  - 10) Construction debris, plant and organic material, trash, and hazardous materials shall be collected and properly disposed.
  - 11) See also project wide measure "Erosion Control Plan".

END OF SECTION

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SECTION 01 60 00  
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.

1.2 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- C. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Schedule delivery of products or equipment as required to allow timely installation and to avoid prolonged storage.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Deliver products or equipment in manufacturer's original unbroken cartons or other containers designed and constructed to protect the contents from physical or environmental damage.
- D. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Clearly and fully mark and identify as to manufacturer, item and installation location.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions. Provide manufacturer's instructions for storage and handling.

- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

#### 1.5 STORAGE FACILITIES

- A. Refer to Section 01 50 00 "Temporary Facilities and Controls".

#### 1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed, except as provided for in the General Provisions.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for any manufacturer not named in accordance with the following article.

#### 1.7 PRODUCT SUBSTITUTION PROCEDURES

- A. General Conditions, Section B-14 – Conformity with Contract Documents and Allowable Deviations.

**Del Norte County**  
Roy Lift Station Emergency Power Project

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Start-up submittals.
- B. Closeout procedures.
- C. Final cleaning.
- D. Starting of systems.
- E. Demonstration and instructions.
- F. Protecting installed construction.
- G. Project record documents.
- H. Operation and maintenance data.
- I. Manual for equipment and systems.
- J. Spare parts and maintenance products.

1.2 START-UP SUBMITTALS

- A. Submit in the chronological order listed below prior to the completion of the Pre-Commissioning Period.
  - 1. Master operation and maintenance training schedule:
    - a. Schedule to include:
      - 1) Target date and time for Owner witnessing of each system initial start-up.
      - 2) Target date for initiation of Acceptance Testing Period.
    - b. Submit schedule for review and approval by the Owner.
  - 2. Completion Submittal:
    - a. File Contractor's Notice of Completion and Request for Inspection.
    - b. Approved Operation and Maintenance manuals received by Owner minimum one (1) week prior to scheduled training.
    - c. Written request for Owner to witness each system commissioning start-up. Request to be received by Owner minimum one (1) week before scheduled training of Owner's personnel on that system.
    - d. Equipment installation and commissioning start-up certifications.
    - e. Letter verifying completion of all commissioning start-up activities including receipt of all specified items from manufacturers or suppliers as final item prior to initiation of Acceptance Testing Period.

### 1.3 CLOSEOUT PROCEDURES

- A. 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 Owner's review.
- B. Provide submittals to Owner required by authorities having jurisdiction.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

### 1.4 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
- C. Clean site; sweep paved areas, rake clean landscaped surfaces.
- D. Remove waste and surplus materials, rubbish, and construction facilities from site.

### 1.5 STARTING OF SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Owner seven (7) calendar days prior to start-up of each item.
- C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.
- G. Require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01330, "Submittal Procedures" that equipment or system has been properly installed and is functioning correctly.

### 1.6 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel prior to date of Substantial Completion.

- B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

#### 1.7 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at pipe and conduit openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

#### 1.8 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other modifications to the Contract.
  - 5. Reviewed Shop Drawings, Product Data, and Samples.
  - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Manufacturer's name, date, and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Field changes of dimension and detail.
4. Details not on original Contract drawings.

G. Submit Record Documents to Owner with claim for final Application for Payment.

#### 1.9 OPERATION AND MAINTENANCE DATA

- A. Submit data as one (1) electronic copy, organized in 8-1/2 x 11 inch (A4) text pages.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, date of submittal.
- C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
  1. Part 1: Directory, listing names, addresses, and telephone numbers of Owner, Engineer, Contractor, Subcontractors, and major equipment suppliers.
  2. Part 2: Operation and maintenance instructions, arranged by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  3. Part 3: Project documents and certificates, including the following:
    - a. Shop drawings and product data.
    - b. Air and water balance reports.
    - c. Certificates.
    - d. Photocopies of warranties and bonds.

#### 1.10 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit one (1) electronic copy of preliminary draft or proposed formats and outlines of contents before start of Work. Owner will review draft and return one (1) electronic copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten (10) days after acceptance.

- C. Submit one (1) electronic copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Owner's Representative comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes in final form within 10 days after final inspection.
- E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.
- G. Include color coded wiring diagrams as installed.
- H. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.
- I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- J. Include servicing and lubrication schedule, and list of lubricants required.
- K. Include manufacturer's printed operation and maintenance instructions.
- L. Include sequence of operation by controls manufacturer.
- M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- N. Include control diagrams by controls manufacturer as installed.
- O. Include Contractor's coordination drawings, with color coded piping diagrams as installed.
- P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- R. Additional Requirements: As specified in individual product specification sections.
- S. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 74 00

### CLEANING AND WASTE MANAGEMENT

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

- A. Maintain Work areas free from accumulations of waste, debris, dust and mud caused by Contractor's operations.
- B. At completion of Work, remove all waste materials, tools, equipment, machinery, surplus materials; leave property clean; leave all rights of ways in a condition equal to that at the beginning of Work.

#### PART 2 PRODUCTS (NOT USED)

#### PART 3 EXECUTION

##### 3.1 PROTECTION

- A. The Contractor shall contact Underground Service Alert (USA) (800) 227-2600 in accordance with the requirements of Section 01 50 00, "Temporary Facilities and Controls."
- B. The Contractor shall be solely responsible for the protection of adjacent properties, structures, streets and utilities. Any damage shall be repaired to its original condition, as determined by the Owner, at the Contractor's expense.
- C. The Contractor shall protect benchmarks, survey control points, and existing structures not identified for removal from damage or displacement.

##### 3.2 CLEARED MATERIAL

- A. Clearing and grubbing shall consist of removal of all objectionable material within the limits of Work shown on the Contract Drawings and as directed by the Owner. Objectionable materials shall include but are not limited to all abandoned pipes, conduits, waste concrete, undergrowth and dead wood. All objectionable cleared material shall become the property of the Contractor and shall be removed from the project site and disposed of or recycled properly.

##### 3.3 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Remove paving, and concrete slabs as indicated on Contract Drawings. Neatly saw cut edges at right angle to surface.

- C. Do not burn or bury materials on site. Leave site in clean condition.

### 3.4 TOP SOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or regarded without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile and protect from erosion. Stockpile material on impervious material and cover over with same material until reuse.
- D. Remove excess topsoil not intended for reuse from site.

### 3.5 DURING CONSTRUCTION

- A. Execute cleaning to insure that any private property, grounds and especially access roads and public properties are maintained free from accumulation of waste materials, dust, mud and debris.
- B. The Contractor shall keep all access roads clean and free of dust, mud and debris resulting from his own operations.
- C. All waste materials, debris and rubbish shall be disposed of at sites to be chosen by Contractor. Prior to dumping soils on any private property, a letter allowing such dumping shall be obtained from the property owner and presented to the for approval.
- D. If, in the opinion of the Owner, the Contractor has not sufficiently cleaned the project area, the Owner shall issue a written notice to the Contractor stating that the Contractor shall clean the project area to the satisfaction of the Owner within forty-eight (48) hours. If the Contractor does not properly clean up (in the opinion of the Engineer or the Owner), then either the Engineer or the Owner shall have the option of using outside equipment to perform the Work and such cost will be withheld from the Contract.

### 3.6 AFTER CONSTRUCTION

- A. If, in the opinion of the Owner, the Contractor has not sufficiently cleaned the project area, the Owner shall issue a written notice to the Contractor stating that the Contractor shall clean the project area to the satisfaction of the Owner within forty-eight (48) hours. If the Contractor does not properly clean up (in the opinion of the Engineer or the Owner), then either the Engineer or the Owner shall have the option of using outside equipment to perform the Work and such cost will be withheld from the Contract. Site shall be left in a condition equal to or better than existed prior to construction.

END OF SECTION

SECTION 02 00 00

EXISTING CONDITIONS

PART 1 GENERAL

1.1 RELATED INFORMATION

- A. Related information and requirements are included in the General Conditions, the individual Sections of the Specifications, and the Contract Drawings.

1.2 INFORMATION ON SITE CONDITIONS

- A. Information obtained by the Owner regarding site conditions, existing facilities, and similar data are shown on the Plans.

1.3 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall satisfy themselves as to the nature and location of the Work, the general and local conditions, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, Work in sensitive environment and uncertainties of weather, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under this contract.
- B. The Contractor further shall satisfy themselves as to the character, quality, and quantity of surface and subsurface materials to be encountered from inspecting the site, as well as from information presented by the Drawings and Specifications made a part of this Contract. Any failure by the Contractor to acquaint themselves with all the available information will not relieve them from responsibility for properly estimating the difficulty or cost of successfully performing the Work.
- C. The Contractor shall note that many of the existing adjacent roads and streets are residential in character and that heavy truck and equipment operations may cause roadway damage in excess of normal usage. Damage caused to the streets by Contractor's operations shall be repaired by the Contractor at no additional cost to the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Includes:

1. Site Demolition required for this Work shall be as specified on contract drawings and as otherwise required to complete the work shown on the drawings. Site demolition is needed to access existing utilities, make utility connections, install new utilities, and other related work necessitated by the utility replacement work. Material salvaging required for this Work shall be as specified on contract drawings and as otherwise required to complete the work shown on the drawings.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 20 00 Price and Payment Procedures.

1.3 JOB CONDITIONS

A. Extent and Character of Demolition:

1. Prior to bidding, the contractor shall verify the extent and character of demolition required to complete the work as shown on the plans and as required by the specifications. The contractor shall anticipate that the area requiring demolition shall be more extensive than that shown on the plans due to materials encountered during excavations, vegetation covering areas to be demolished, and the overall nature of the work. Also, the contractor should expect that the thickness and character of the materials to be demolished may be more extensive than shown and could be variable. Concrete should be assumed to be reinforced with rebar.

B. Dust control:

1. Use all means necessary to prevent the spread of dust during performance of the work of this Section. The contractor shall be responsible for obtaining and paying for water for dust control.

C. Runoff and Erosion Control:

1. The contractor shall be responsible for complying with the Stormwater Best Management Practices and any other requirements of permits required for the project. This shall include the control of runoff and erosion associated with demolition.

D. On Site Burning

1. On-site burning will not be permitted.

E. Protection:

1. Use all means necessary to protect existing structures designated to remain and, in the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner at no additional cost to the Owner.
2. Use all means necessary to protect existing utilities, roadways, driveways, paths of travel and other features to remain in service.
3. The road shall be in active use throughout the construction project and so the contractor is responsible for coordinating activities with the owner and installing and maintaining temporary barricades, trench plates, detours, and other control features to allow all activities to continue while protecting work areas and pedestrians.

## PART 2 PRODUCTS - Not Used

## PART 3 EXECUTION

### 3.1 SITE INSPECTION

- A. Prior to bidding and again prior to any demolition work, carefully inspect the site and determine the extent of work involved as well as above and below ground utilities. The contractor shall locate all utilities prior to demolition. The contractor should anticipate that not all utilities are shown on the plans and that further investigation by the contractor is required.
- B. Report any discrepancy to the Owner immediately.

### 3.2 COORDINATION AND SCHEDULING

- A. Schedule and coordinate demolition with Owner, any utilities or other contractors which may be involved.

### 3.3 HAZARDOUS MATERIALS

- A. If Contractor encounters existing asbestos cement piping they shall handle per US EPA and OSHA regulations.

### 3.4 SAFETY

- A. All work shall conform to pertinent OSHA regulations and to other local codes and ordinances as applicable.

### 3.5 REMOVAL OF DEBRIS AND SITE RESTORATION

- A. Remove all debris from the site and dispose of in accordance with all local and federal laws and regulations. Leave the site in a neat and orderly condition. Restore areas as specified on the plans or as per preconstruction conditions.

END OF SECTION

SECTION 03 30 00  
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Formwork.
  - 2. Reinforcement.
  - 3. Accessories.
  - 4. Cast-in place concrete.
  - 5. Finishing and curing.
  
- B. Related Sections:
  - 1. Section 31 05 13 – Soils for Earthwork

1.2 APPLICABLE CODES AND STANDARDS

- A. Governing Codes and Standards:
  - 1. Type 2 Aggregate Base: Shall be in accordance with Section 26 *Aggregate Bases*, of Caltrans Standard Specifications, Latest Edition.
  - 2. Structural Concrete/Minor Concrete: Shall be in accordance with Section 90 *Concrete*, of Caltrans Standard Specifications, Latest Edition.
  - 3. Rebar: Shall be in accordance with Section 52 *Reinforcement*, of Caltrans Standard Specifications, Latest Edition.

1.3 SUBMITTALS

- A. Section 01 33 00 – Submittal Procedures
  
- B. Shop Drawings:
  - 1. Indicate pertinent dimensioning.
  - 2. Indicate reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, supporting and spacing devices.
  
- C. Product Data: Indicate admixtures and anchors.
  
- D. Design Data: Submit mix designs.
  
- E. Testing: Submit results of testing including compressive strength slump.
  
- F. Transit mix delivery slips
  - 1. Keep a record at the job site showing the time and place of each pour of concrete, together with transit mix delivery slip certifying contents of the pour, time of batching, etc.
  
- G. Provide one (1) electronic copy of the record to the Owner daily or at other intervals upon request.

#### 1.4 QUALITY ASSURANCE

- A. Construct and erect concrete formwork in accordance with ACI 318.
- B. Perform concrete reinforcing work in accordance with ACI 318.
- C. Perform cast-in-place concrete work in accordance with ACI 318.
- D. Qualifications of workmen:
  - 1. Provide at least one (1) person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly trained and experienced in placing the types of concrete specified and who shall direct all Work performed under this Section.
  - 2. For finishing of exposed surfaces of the concrete, use only thoroughly trained and experienced journeyman concrete finishers.

#### PART 2 PRODUCTS

##### 2.1 FORM MATERIALS AND ACCESSORIES

- A. Form Materials: At discretion of Contractor.
- B. Form Release Agent: Colorless mineral oil not capable of staining concrete or impairing natural bonding characteristics of coating intended for use on concrete.

##### 2.2 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for support of reinforcing; plastic tipped or non-corroding for supports in slabs forming finished ceilings or where supports are exposed to weather.
- C. Fabricate concrete reinforcement in accordance with ACI 318.

##### 2.3 CONCRETE MATERIALS

- A. Structural Concrete/Minor Concrete: Per Section 90 *Concrete*, of Caltrans Standard Specifications

#### PART 3 EXECUTION

##### 3.1 FORMWORK ERECTION

- A. Erect formwork, shoring and bracing to achieve design requirements.
- B. Camber slabs and framing to achieve ACI 301 tolerances.

- C. Provide bracing to ensure stability of formwork.
- D. Apply form release agent to formwork prior to placing form accessories and reinforcement.
- E. Clean forms as erection proceeds, to remove foreign matter.

### 3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

- A. Provide formed openings where required for work to be embedded in and passing through concrete members.
- B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
- C. Install concrete accessories straight, level, and plumb.

### 3.3 REINFORCEMENT PLACEMENT

- A. Place reinforcement, supported and secured against displacement.
- B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.
- C. Space reinforcement bars with minimum clear spacing in accordance with ACI 318.
- D. Maintain concrete cover around reinforcement in accordance with ACI 318.

### 3.4 PLACING CONCRETE

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.
- B. Remove all wood scraps, debris, and standing water from the areas in which concrete will be placed. Use cleanout openings in wall forms and otherwise where access for removal of debris is not practicable.
- C. Place concrete continuously between predetermined expansion, control and construction joints.
- D. Concrete shall be placed and consolidated by methods that will not cause segregation of the aggregates and will result in dense, homogeneous concrete which is free of voids and rock pockets. All concrete shall be placed while fresh and before it has taken an initial set.
- E. Forms and subgrade shall be thoroughly moistened with water immediately before placing concrete.
- F. Concrete shall be consolidated by means of high frequency internal vibrations within fifteen (15) minutes after it is deposited in the forms. The vibrators shall not be attached to or held against the forms or reinforcing steel. The vibration shall be done with care and in such a manner that displacement of reinforcement is avoided.

- G. Where new concrete is doweled to existing Work, drill holes in existing concrete and secure dowels with epoxy grout per manufacturer's instructions.
- H. Screed slabs-on-grade level, unless it is sloped to a drain.

### 3.5 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Remove formwork progressively and in accordance with code requirements.

### 3.6 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301.
- B. Uniformly spread, screed, and float concrete.
- C. Maintain surface flatness, with maximum variation of quarter (1/4) inch in ten (10) feet.
- D. In areas with floor drains, maintain floor level at walls and slope surfaces uniformly to drains.

### 3.7 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
  - 1. Protect concrete footings from freezing for minimum of five (5) days.
- B. Place absorptive matting, moisten, and keep damp.
- C. Immediately after placement, protect concrete from premature drying.
- D. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete for not less than seven (7) days.
- E. At formed surface, wet forms at least twice daily or sufficient to minimize moisture loss until forms are removed or until seven (7) days have elapsed from time of pour. If forms are removed before seven (7) days, cure concrete for remaining days similar to exposed surfaces.

### 3.8 FORMED SURFACES

- A. Provide all formed surfaces with smooth rubbed finish.

### 3.9 ERECTION TOLERANCES

- A. Install reinforcement within tolerances required by ACI 318.

### 3.10 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with ACI 318.
- B. Reinforcement Inspection:
  - 1. Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
- C. Strength Test Samples:
  - 1. Sample concrete and make one set of three (3) cylinders for every 150 cubic yards or less of each class of concrete placed each day and for every 5,000 square feet of surface area for slabs and walls.
- D. Field Testing:
  - 1. Measure slump and temperature for each compressive strength concrete sample.
  - 2. Measure air content in air entrained concrete for each compressive strength concrete sample.
- E. Cylinder Compressive Strength Testing:
  - 1. Test Method: ASTM C39/C39M.
  - 2. Test Acceptance: In accordance with ACI 318.
  - 3. Test 1 cylinder at 7 days.
  - 4. Test two cylinders at 28 days.
  - 5. Dispose remaining cylinders when testing is not required.
- F. Contractor to submit all test results to Owner for final approval.
- G. Notification: Notify the Owner at least sixty (60) hours prior to placing concrete.

### 3.11 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by the Owner.

END OF SECTION

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SECTION 03 60 00

GROUT

PART 1 - GENERAL

1.1 THE REQUIREMENT

- A. The Contractor shall provide all materials, equipment, and labor necessary to furnish and place grout and shall form, mix, place, cure, repair, finish, and do all other work as necessary to produce finished grout as shown on the Drawings and as specified herein.
- B. The following types of grout shall be covered in this Section:
  - 1. Non-Shrink Grout: Non-Shrink grout is to be used unless another type is specifically referenced or as shown on the Drawings.
  - 2. Epoxy Grout
  - 3. Cement Grout

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 02 00 00 – Existing Conditions.
- B. Division 03 30 00 – Cast-In-Place Concrete.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Specifications, codes, and standards shall be as specified in Section 03 30 00, "Cast-in-Place Concrete," and as referred to herein.
- B. Commercial Standards:
  - 1. ASTM C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-In. or 50-mm Cube Specimens).
  - 2. ASTM C 531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
  - 3. ASTM C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
  - 4. ASTM C 827 Test Method for Change in Height of Early Ages of Cylindrical Specimens from Cementitious Mixtures.
  - 5. ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics.
  - 6. CRD-C 621 Corps of Engineers Specification for Non-shrink Grout.

1.4 CONTRACTOR SUBMITTALS

- A. Certificates of Compliance: Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

## PART 2 - PRODUCTS

### 2.1 PREPACKAGED GROUTS

- A. Non-Shrink Grout:
  - 1. Non-shrink grout shall be a prepackaged, inorganic, non-gas-liberating, non-metallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout specified herein shall be that recommended by the manufacturer for the particular application.
  - 2. Non-shrink grouts shall have a minimum 28-day compressive strength of 7000 psi; shall have no shrinkage (zero percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C 827; and shall have no shrinkage (zero percent) and a maximum of 0.2-percent expansion in the hardened state when tested in accordance with CRD C 621.
  - 3. Application: Non-shrink grout shall be used for the repair of all holes and defects in concrete members, grouting under all equipment base plates, and at all locations where non-shrink grout is specified; except
  
- B. Epoxy Grout:
  - 1. Epoxy grout shall be a pourable, non-shrink, 100-percent solids system. The epoxy grout system shall have 3 components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.
  - 2. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.
  - 3. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.
  - 4. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in 7 days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (zero percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.
  - 5. Application: Epoxy grout shall be used to embed all anchor bolts and reinforcing steel required to be set in grout, and for all other specified applications.

## 2.2 CEMENT GROUT

- A. Cement Grout: Cement grout shall be composed of one part cement, 3 parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white Portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 days shall be 4000 psi.
- B. Cement shall be as specified in Section 03 30 00, "Cast-in-Place Concrete."

## 2.3 CONSISTENCY

- A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is such that the grout is plastic and moldable but will not flow. Where "dry pack" is specified, it shall mean a grout of that consistency; the type of grout to be used shall be as specified herein for the particular application.

## 2.4 MEASUREMENT OF INGREDIENTS

- A. Measurements for cement grout shall be made accurately by volume using appropriate containers. Shovel measurement will not be allowed.
- B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. All surface preparation, curing, and protection of cement grout shall be as specified in Section 03 30 00, "Cast-in-Place Concrete." The finish of the grout surface shall match that of the adjacent concrete.
- B. The manufacturer of non-shrink grout and epoxy grout shall provide on-site technical assistance upon request.
- C. All mixing, surface preparation, handling, placing, consolidation and other means of execution for prepackaged grouts shall be done according to the printed instructions and recommendations of the manufacturer.

3.2 CONSOLIDATION

- A. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

END OF SECTION

SECTION 04 05 03

MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes mortar and grout for masonry.
- B. Related Sections:
  - 1. Section 01 30 00 Administrative Requirements
  - 2. Section 01 33 00 Submittals
  - 3. Section 01 40 00 Quality Requirements
  - 4. Section 04 20 00 Unit Masonry: Installation of mortar and grout.

1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 530 - Building Code Requirements for Masonry Structures.
  - 2. ACI 530.1 - Specifications for Masonry Structures.
- B. ASTM International:
  - 1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes.
  - 2. ASTM C91 - Standard Specification for Masonry Cement.
  - 3. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
  - 4. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
  - 5. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
  - 6. ASTM C150 - Standard Specification for Portland Cement.
  - 7. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
  - 8. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
  - 9. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
  - 10. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
  - 11. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
  - 12. ASTM C476 - Standard Specification for Grout for Masonry.
  - 13. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
  - 14. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
  - 15. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
  - 16. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
  - 17. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
  - 18. ASTM C1329 - Standard Specification for Mortar Cement.
  - 19. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength.

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal requirements.
- B. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.
- C. Test Reports:
  - 1. Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 and compressive strength.
  - 2. Submit reports on grout indicating conformance of grout to property requirements of ASTM C476.
- D. Manufacturer's Installation Instructions: Submit premix mortar manufacturer's installation instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 and ACI 530.1.

### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.
- B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than eight (8) mph.

## PART 2 PRODUCTS

### 2.1 COMPONENTS

- A. Masonry Cement: ASTM C91, Type S.
- B. Mortar Aggregate: ASTM C144, standard masonry type.
- C. Grout Aggregate: ASTM C404, fine and coarse.
- D. Water: Clean and potable.
- E. Calcium chloride is not permitted.

### 2.2 MIXES

- A. Mortar Mixes:
  - 1. Mortar for Structural Masonry: ASTM C270, Type S using proportion specifications.
  - 2. 2,000 psi strength at 28 days.

- B. Mortar Mixing:
  - 1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
  - 2. Achieve uniformly damp sand immediately before mixing process.
  - 3. Re-temper only within two hours of mixing.
- C. Grout Mixes:
  - 1. 2,000 psi strength at 28 days; eight (8) to eleven (11) inches slump; mixed in accordance with ASTM C476 Fine or Coarse grout.
  - 2. Do not use admixtures unless approved by the Engineer.
  - 3. Do not use anti-freeze compounds to lower freezing point of grout.
- D. Grout Mixing - Either of the following may be used:
  - 1. Mix grout in accordance with ASTM C94/C94M modified to use ingredients complying with ASTM C476.
  - 2. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Request inspection of spaces to be grouted.

### 3.2 INSTALLATION

- A. Install mortar and grout in accordance with ACI 530.1 Specifications for Masonry Structures.
- B. Grouting Technique: At the contractor's option, use either low-lift or high-lift grouting in accordance with ACI 530.1 Specifications for Masonry Structures.

### 3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Testing Frequency: In accordance with TMS 602-16, test masonry by unit strength method for every 5,000 sf of completed wall area.
- C. Testing of Mortar Mix: In accordance with ASTM C780 for aggregate ratio, water content, and compressive strength.
- D. Testing of Grout Mix: In accordance with ASTM C1019 for compressive strength, and in accordance with ASTM C143/C143M for slump.

END OF SECTION

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SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes concrete masonry units, reinforcement, anchorage, and accessories.
- B. Related Sections:
  - 1. Section 01 30 00 Administrative Requirements
  - 2. Section 01 33 00 Submittals
  - 3. Section 04 05 03 Masonry Mortaring and Grouting: Mortar and grout.

1.2 REFERENCES

- A. American Concrete Institute:
  - 1. ACI 530 - Building Code Requirements for Masonry Structures.
  - 2. ACI 530.1 - Specifications for Masonry Structures.
- B. ASTM International:
  - 1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  - 3. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  - 4. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
  - 5. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

1.3 PERFORMANCE REQUIREMENTS

- A. Concrete Masonry Compressive Strength (f'm): 1,500 psi; determined by unit strength method.
  - 1. Concrete Masonry Units: 2000 psi minimum net area compressive strength.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal requirements.
- B. Product Data:
  - 1. Submit data for concrete masonry units and other accessories.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.

## 1.6 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years' experience.

## 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than forty (40) degrees F.
- B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than ninety (90) degrees F with wind velocity greater than eight (8) mph.

## 1.8 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate masonry work with installation of doors and louvers.

## PART 2 PRODUCTS

### 2.1 COMPONENTS

- A. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90; normal weight.
- B. Concrete Masonry Unit Size and Shape: Nominal modular size of 8x8x16 inches. Furnish special units 90 degree corners, bond beams, and lintels.
- C. Color: Submit color sample to owner for approval prior to construction.
- D. Type: Split face.

### 2.2 ACCESSORIES

- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
- B. Anchor Rods: ASTM A307; Grade C; J-shaped or L-shaped; complete with washers and heavy hex nuts; sized for minimum fifteen (15) inch embedment; galvanized finish.
  - 1. Hot-Dipped Galvanizing: ASTM A153/A153M.
- C. Mortar and Grout: As specified in Section 04 05 03.
- D. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials, recommended by masonry unit manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: coordination and project conditions.
- B. Verify field conditions are acceptable and are ready to receive work.
- C. Verify items provided by other sections of work are properly sized and located.
- D. Verify built-in items are in proper location, and ready for roughing into masonry work.

### 3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other sections.
- B. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

### 3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing: One unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave.
- D. Placing And Bonding:
  - 1. Lay hollow masonry units with face shell bedding on head and bed joints.
  - 2. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
  - 3. Remove excess mortar as work progresses.
  - 4. Interlock intersections and external corners.
  - 5. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
  - 6. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- E. Grouted Components:
  - 1. Lap splices bar diameters required by code.
  - 2. Support and secure reinforcing bars from displacement.
  - 3. Place and consolidate grout fill without displacing reinforcing.
- F. Reinforced Masonry:
  - 1. Lay masonry units with cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
  - 2. Place reinforcement bars as indicated on Drawings.

3. Support and secure reinforcement from displacement.
4. Place and consolidate grout fill without displacing reinforcing.
5. Place grout in accordance with ACI 530.1 Specification for Masonry Structures.

G. Control Joints:

1. Install control joints where indicated on Drawings:
2. Do not continue horizontal joint reinforcement through control joints.
3. Form control joint with sheet building paper bond breaker fitted to one side of hollow contour end of block unit. Fill resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

H. Built-In Work:

1. As work progresses, install built-in metal door frames, and other items to be built-in the work and furnished by other sections.
2. Install built-in items plumb and level.
3. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar.
4. Do not build in materials subject to deterioration.

I. Cutting And Fitting:

1. Cut and fit for pipes and gable end roof slope. Coordinate with other sections of work to provide correct size, shape, and location.
2. Obtain Engineer's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

### 3.4 ERECTION TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
- G. Maximum Variation for Steel Reinforcement:
  1. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.
  2. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
  3. Plus or minus 1 inch when distance is between 8 and 24 inches.
  4. Plus or minus 1-1/4 inch when distance is greater than 24 inches.
  5. Plus or minus 2 inches from location along face of wall.

3.5 FIELD QUALITY CONTROL

- A. Concrete Masonry Units: Test each type in accordance with ASTM C140.

3.6 CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

3.7 PROTECTION OF FINISHED WORK

- A. Protect exposed external corners subject to damage.
- B. Protect base of walls from mud and mortar splatter.
- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when work is not in progress.

END OF SECTION

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SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes structural wall, and roof framing; wall and roof sheathing; preservative treatment; and roof curbs and cants; blocking in wall and roof openings; wood furring and grounds; electrical panel back boards, concealed wood blocking.

1.2 SUBMITTALS

- A. Shop Drawings: Indicate framing system, loads and cambers, bearing details, and framed openings.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
  - 1. Lumber Grading Agency: Certified by DOC PS 20.
  - 2. Wood Structural Panel Grading Agency: Certified by APA - The Engineered Wood Association.
  - 3. Lumber: DOC PS 20.
  - 4. Wood Structural Panels: DOC PS 1 or DOC PS 2.

PART 2 - PRODUCTS

2.1 LUMBER MATERIALS

- A. Lumber Grading Rules: WCLIB
- B. Beam and Joist Framing: Douglas Fir-Larch (DF-L), #1 or better grade, 19 percent maximum moisture content.
- C. Posts, Headers & Stiffeners (4x or less): Douglas Fir-Larch (DF-L), #1 grade, 19 percent maximum moisture content.
- D. Studs: Douglas Fir-Larch (DF-L), #1 grade, 19 percent maximum moisture content.
- E. Engineered Wood Members ("Paralam, Verslam" etc.):
  - 1. Boise Cascade Versalam 2.0E or approved equal/better.
- F. Sill Plates and Wood exposed to earth and weather: Pressure treated.

## 2.2 SHEATHING MATERIALS

- A. Plywood Roof Sheathing: 5/8 inch thick, Structural I plywood, Span Rating 32-16; Exterior exposure. Minimum panel width 24 inches, Sheathing shall be blocked and fasten with 8d nails at 6" on center (Field and Edge Nailing)
- B. Plywood Wall Sheathing: 1/2 inch thick, Structural I plywood; Exterior exposure (interior walls may be exposure 1). Minimum panel width 24 inches.

## 2.3 ACCESSORIES

- A. Fasteners and Anchors: ASTM A153/A153M, hot dipped galvanized.

## 2.4 WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment): AWWA U1, Commodity Specification A-Sawn Products or F-Wood Composites using water-borne preservative.
- B. Moisture Content after Treatment: Redried Kiln dried (KDAT).
  - 1. Lumber: Maximum 19 percent.
  - 2. Structural Panels: Maximum 15 percent.

## PART 3 - EXECUTION

### 3.1 FRAMING

- A. Set structural members level and plumb, in correct position.
- B. Fasten framing in accordance with chapter 23 of the 2022 CBC.
- C. Place horizontal members crown side up.
- D. Place full width continuous termite shield and sill flashing on foundations.
- E. Place sill gasket directly on sill flashing.
- F. Frame double joist headers at floor and ceiling openings. Frame rigidly into joists. Frame double joists under wall studding.
- G. Bridge joists framing in excess of 8 feet span at mid-span members. Fit solid blocking bridging at ends of members.
- H. Curb roof openings except where curbs are provided. Construct curb members of single pieces for each side.

### 3.2 SHEATHING

- A. Fasten sheathing per plans and in accordance with chapter 23 of the 2022 CBC.
- B. Secure wall sheathing with ends staggered, over firm bearing.

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- C. Use sheathing clips between sheets between roof framing members. Install solid edge blocking between sheets.
- D. Install telephone and electrical panel back boards with plywood sheathing material where required. Size back board by 12 inches beyond size of electrical panel.

**3.3 SITE APPLIED WOOD TREATMENT**

- A. Treat site-sawn cuts. Apply preservative to site-sawn cuts in accordance with AWPA M4.
- B. Brush apply two coats of preservative treatment on untreated wood in contact with cementitious materials, roofing and related metal flashings.
- C. Allow preservative to cure prior to erecting members.

END OF SECTION

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## SECTION 06 17 53

### SHOP-FABRICATED WOOD TRUSSES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Shop-fabricated wood trusses for:
    - a. Roof framing.
    - b. Bridging, bracing, and anchorage.
  - 2. Preservative treatment of wood.

##### 1.2 SUBMITTALS

- A. Product Data: Submit truss plate connections, bearing plates, anchor connections, wind uplift connections, bridging and bracing, and out of plane wind and seismic connections.
- B. Shop Drawings: Indicate truss sizes, dimensions, spacing of trusses, associated components, uplift connectors, web and chord sizes, plate sizes, fastener descriptions and spacing, loads and truss cambers, and framed openings.
- C. Design Calculations: Indicate design loads, truss reactions, and member forces, deflections, and stresses.
- D. Manufacturer's/Fabricator's Certificate: Certify that products meet or exceed specified requirements.
- E. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations for sizes, dimensions, spacing of trusses, associated components, uplift connectors, web and chord sizes, plate sizes, fastener descriptions and spacing design loads, truss cambers, and framed openings.
- F. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- G. Qualifications Statements:
  - 1. Submit qualifications for manufacturer/fabricator, erector, and licensed professional.
  - 2. Submit manufacturer's/fabricator's approval of erector.

##### 1.3 QUALITY ASSURANCE

- A. Perform Work as follows:
  - 1. Lumber Grading: Certified by DOC PS 20.
  - 2. Plywood Grading Agency: Certified by APA.
  - 3. Lumber: Comply with DOC PS 20.
  - 4. Wood Structural Panels: DOC PS 1 or DOC PS 2.
- B. Truss Design, Fabrication, and Installation: Comply with TPI BSCI, TPI DSB, and TPI 1.
- C. Apply label from agency approved by authority having jurisdiction to identify each preservative-treated material.

- D. Perform Work according to 2019 California Building Code standards.
- E. Manufacturer/Fabricator: Company specializing in manufacturing products specified in this Section with three years' experience.
- F. Erector: Company specializing in performing Work of this Section with minimum three years' experience and approved by the manufacturer/fabricator.
- G. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in the State of California (Civil or Structural Engineer).

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Storage:
  - 1. Do not lay trusses flat.
  - 2. Store truss depth in vertical position resting on intermittent bearing pads.

#### 1.5 EXISTING CONDITIONS

- A. Field Measurements:
  - 1. Verify field measurements prior to fabrication.
  - 2. Indicate field measurements on Shop Drawings.

### PART 2 PRODUCTS

#### 2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Design Roof Loads: Roof Live Load 20 psf. Roof Dead Load 15 psf typical. Ground Snow Load 50psf. Additional ceiling load of 3 psf at all locations. Deflection limited to 1/240.
- B. Wind Loading: See plan sections and schedule.

#### 2.2 SUSTAINABILITY CHARACTERISTICS

- A. Materials and Resources Characteristics:
  - 1. Certified Wood Materials: Furnish wood materials certified according to FSC guidelines.
- B. Indoor Environmental Quality Characteristics:
  - 1. Composite Wood Products: Maximum VOC content according to product and testing requirements of CA/DHS/EHLB/R-174.
- C. Indoor Environmental Quality Characteristics:
  - 1. Composite Wood Products: Contain no added urea formaldehyde resins.

#### 2.3 MATERIALS

- A. Lumber Grading Rules: Comply with WCLIB.
- B. Wood Members:
  - 1. Single top and bottom chord.
  - 2. Douglas Fir-Larch #1
  - 3. Moisture Content: Maximum 19%

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- C. Plywood Plate:
  - 1. Comply with APA/EWA Plywood Design Specification.
  - 2. Material: Structural I
- D. Steel Plate Connectors:
  - 1. Comply with TPI 1, Section 6, galvanized.
- E. Truss Bridging: As required by truss designer/manufacturer.

**2.4 FABRICATION**

- A. Fabricate trusses to achieve specified structural requirements.
- B. Fabricate bottom and top chord extensions as indicated.
- C. Frame special sized openings in web framing as indicated.

**2.5 ACCESSORIES**

- A. Wood blocking, plating, support members and framing for openings as specified in section 06 10 00 Rough Carpentry.
- B. Fasteners and Anchors:
  - 1. Material:
    - a. Exterior, High Humidity and Treated Wood Locations: ASTM A153 hot dipped galvanized steel.
    - b. Elsewhere: Unfinished steel.
  - 2. Nails and Staples: Comply with ASTM F1667.

**2.6 SOURCE QUALITY CONTROL**

- A. Inspection: Inspect Work performed at manufacturer's/fabricator's facility to verify conformance to Contract Documents.
- B. Certificate of Compliance:
  - 1. If manufacturer/fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's/fabricator's facility conforms to Contract Documents.
  - 2. Specified shop tests are not required for Work performed by approved manufacturer/fabricator.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- A. Verify that supports and openings are ready to receive trusses.

**3.2 PREPARATION**

- A. Coordinate placement of bearing support items.

3.3 ERECTION

- A. Make provisions for erection loads and sufficient temporary bracing to maintain plumb and aligned structure until completion of erection and installation of permanent bracing.
- B. Do not field cut or alter structural members without approval of Architect/Engineer.
- C. Frame openings between trusses with lumber as specified in section 06 10 00 Rough Carpentry.

3.4 TOLERANCES

- A. Maximum Variation from Indicated Position:
  - 1. Framing Members: 1 inch.

END OF SECTION

SECTION 07 19 00

DRYLOK SILOZANE 7 BRICK & MASONRY PENETRATING SEALER

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes sealing exterior brick and masonry surfaces.
- B. Related Sections:
  - 1. Section 03 30 00 – Cast-in-Place Concrete.
  - 2. Section 03 41 00 – Precast Structural Concrete.
  - 3. Section 03 47 13 – Tilt-Up Concrete.
  - 4. Section 04 21 00 – Masonry Assemblies Unit Masonry.
  - 5. Section 04 22 00 – Concrete Unit Masonry
  - 6. Section 07 16 13 – Polymer Modified Cement Waterproofing
  - 7. Section 09 97 26 – Cementitious Coatings.

1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. ACI ASTM D 16 – Standard Terminology for Paint, Related Coatings, Materials and Applications.
  - 2. ASTM D 5095 – Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellant Treatments.
  - 3. ASTM D 6904 – Standard Practice for Resistance to Wind-Driven Rain for Exterior Coatings Applied to Masonry.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: For each type of product.
  - 1. Include construction details, materials descriptions and tested physical properties.
  - 2. Include manufacturer's instructions for evaluating, preparing and treating substrate.
- C. Shop Drawings:
  - 1. Show locations and extent of application.
- D. Samples:
  - 1. For each product specified, two cured samples, representing actual product color and texture.

1.4 QUALITY ASSURANCE

- A. Comply with Section 01 40 00.

- B. Qualifications:
  - 1. Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products and systems.
  - 2. Applicator Qualifications: Company with minimum of 5 years' experience in application of products as specified in this section on projects of similar size and scope and employs installers and supervisors who are trained by and acceptable to product manufacturer.
    - a. Successful completion of a minimum of 5 projects of similar size and complexity to specified Work.
- C. Field Mock-up:
  - 1. Install at Project site or pre-selected area of building an area for field mock-up, as directed by Architect.
  - 2. Apply material in strict accordance with manufacturer's written application instructions.
  - 3. Manufacturer's representative or designated representative will review technical aspects; surface preparation, application, and workmanship.
  - 4. Field sample will be standard for judging workmanship on remainder of Project.
  - 5. Maintain field mock-up during construction for workmanship comparison.
  - 6. Do not alter, move, or destroy field mock-up until Work is completed and approved by Architect.
  - 7. Obtain Architect's written approval of field mock-up before start of material application, including approval of aesthetics, color, texture, and appearance.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 00.
- B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Transport and store in unopened containers and keep in clean, dry condition protected from rain, dew, and humidity.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Requirements:
  - 1. Do not apply outdoors in rain or when rain is expected within 48 hours. Do not apply above 90 degrees F (32 degrees C) or below 50 degrees F (10 degrees C) or when temperatures are expected to fall below 40 degrees F (4 degrees C) within 24 hours.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from the following manufacturer:
  - 1. United Gilsonite Laboratories (UGL), which is located at 1396 Jefferson Avenue, P.O. Box 70 Scranton, PA 18501; Customer Service: 1-800-845-5227 or 1-570-344-1202; Email: [ugllabs@ugl.com](mailto:ugllabs@ugl.com); Website: [www.ugl.com](http://www.ugl.com)
- B. Substitutions: Not Permitted.
- C. Specifications and Drawings are based on manufacturer's proprietary literature from United Gilsonite Laboratories (UGL).
- D. Single Source Limitation for Complete System: Obtain materials from a single manufacturer to create a complete system.

### 2.2 MATERIALS

- A. Water based silane/siloxane blend penetrating sealer for brick, concrete, masonry, slate, stone and stucco surfaces.
  - 1. Acceptable Product:
    - a. DRYLOK® Siloxane 7 Brick and Masonry Penetrating Sealer.

### 2.3 MIXING

- A. Stir thoroughly before application.
- B. Thinning is prohibited.
- C. Color: Clear

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Comply with Section 01 70 00.

### 3.2 SURFACE PREPARATION

- A. Ensure that substrates are dry, sound and free of dust, dirt, loose particles or other contaminants that could impair bond of the coating.
- B. If efflorescence is present, Treat with DRYLOK® ETCH or muriatic acid and remove it by pressure washing with clean water and allow to dry 48 hours.

### 3.3 APPLICATION - GENERAL

- A. Stir DRYLOK® SILOXANE 7 BRICK AND MASONRY PENETRATING SEALER thoroughly before application.
- B. Refer to manufacturer's written instructions on the container or available on the manufacturer's website.
- C. Apply coating with a brush or low-pressure spray equipment. Begin application at the top of the wall or surface. Flood surface evenly and generously with product and allow to run down 8 – 12 inches. [20 - 25 cm].
- D. Two coats can be applied to porous surfaces. Allow first coat to penetrate 5-10 minutes, then apply second coat by brush or spray.
- E. Protect coating for 6 hours from rainfall.

### 3.4 CLEANING

- A. Clean material from tools and equipment as instructed in the written instructions on the container or available on the manufacturer's website.

### 3.5 PROTECTION

- A. Protect work from damage of other trades during construction. Correct deficiencies or damage by cleaning, repairing, reapplying or recoating, as approved by Architect.

END OF SECTION

SECTION 07 61 03

MANUFACTURED SHEET METAL ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Architectural standing seam metal roofing.
  2. Metal soffit panels.
  3. Underlayment.
  4. Metal facias, flashings, and trim.
  5. Metal gutters and downspouts.

1.2 REFERENCES

- A. American Architectural Manufacturers Association:
1. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  2. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
  3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. American Iron and Steel Institute:
1. AISI General - Standard for Cold-Formed Steel Framing - General Provisions.
  2. AISI Header - Standard for Cold-Formed Steel Framing - Header Design.
  3. AISI NASPEC - North American Specification for Design of Cold-Formed Steel Structural Members.
- C. American Society of Civil Engineers:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- D. ASTM International:
1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  2. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  3. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  4. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
  5. ASTM C1371[-2004a] - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
  6. ASTM C1549[-2004] - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
  7. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

8. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
9. ASTM D2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
10. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
11. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
12. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
13. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
14. ASTM E408[-1971(1996)e1] - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
15. ASTM E903[-1996] - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
16. ASTM E1918[-1997] - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
17. ASTM E1980[-2001] - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

E. Federal Specification Unit:

1. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

F. National Roofing Contractors Association:

1. NRCA - The NRCA Roofing and Waterproofing Manual.

G. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - Architectural Sheet Metal Manual.

H. Underwriters Laboratories Inc.:

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies.

I. U.S. Environmental Protection Agency:

1. ENERGY STAR - ENERGY STAR Voluntary Labeling Program.

### 1.3 DESIGN REQUIREMENTS

A. Wind Uplift Resistance: UL 580; Class 90.

B. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with 2022 California Building Code (CBC).

C. Air Infiltration: Limit air leakage through roof assembly to 0.03 cfm/sq ft of wall area, measured at reference differential pressure across assembly of 1.57] psf when tested in accordance with ASTM E283.

D. Water Leakage: None, when measured in accordance with ASTM E331 with test pressure of 6.24 psf.

- E. Gutter and Downspout Components: Conform to 2022 California Building Code (CBC) for size and method of rain water discharge.
- F. Exterior Components: Accommodate the following without damage to system, components or deterioration of seals.
  - 1. Movement within system.
  - 2. Movement between system and perimeter framing components.
  - 3. Dynamic loading and release of loads.
  - 4. Deflection of structural support framing.
  - 5. Expansion and contraction from temperature range of 170 degrees F over 12 hour period.

#### 1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings:
  - 1. Indicate metal roofing and soffit panel profiles, jointing patterns, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Product Data:
  - 1. Submit data on metal types, finishes, and characteristics.
  - 2. Submit color charts for finish selection.
- D. Samples:
  - 1. Submit two samples illustrating metal finish color.
- E. Manufacturer's Installation Instructions: Submit instructions including special procedures for roofing penetrations, flashings, and perimeter conditions requiring special attention.
- F. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

#### 1.5 SUSTAINABLE DESIGN SUBMITTALS

- A. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
  - 1. Sustainable Sites Certificates:
    - a. Certify roofing materials solar reflectance index.

#### 1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA Architectural Sheet Metal Manual and The NRCA Roofing and Waterproofing Manual.
- B. Perform Work in accordance with 2022 California Building Code (CBC).

#### 1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials causing discoloration or staining.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 WARRANTY

- A. Furnish 20 year manufacturer warranty for metal finish against fading, chipping, chalking, and blistering.

PART 2 PRODUCTS

2.1 MANUFACTURED SHEET METAL ROOFING

- A. Architectural Standing Seam Metal Roofing: Factory formed metal roofing panel system with concealed fasteners.
  - 1. Panel Materials: 0.04-inch min Kynar 500 painted aluminum.
  - 2. All Flashing to match. High-temperature ice and water shield underlayment is required under entire roof.
  - 3. Panel Width: Nominal 12, 16, 04 18 inches.
  - 4. Panel Profile: Flat accent ribs or striations.
  - 5. Seam Type: Sanding seam snap interlocked.
  - 6. Seam Height: 1-1/2.
  - 7. Color: As selected by Owner.
- B. Metal Soffit Panels: Factory formed metal soffit panel system with concealed fasteners.
  - 1. Panel Materials: 0.04-inch min Kynar 500 painted aluminum.
  - 2. Panel Width: Nominal 12 inches.
  - 3. Panel Profile: Ribbed solid.
  - 4. Panel Joint: Interlocked.
  - 5. Color: To match roof color.

2.2 SHEET METAL MATERIALS

- A. Pre-Finished Aluminum Sheet: Coil coated.
  - 1. Base Metal: ASTM B209, alloy and temper as required for application and finish.
  - 2. Exposed Finish: AAMA 2605; minimum two coat fluoropolymer coating with minimum 70 percent polyvinylidene fluoride resin.

2.3 ACCESSORIES

- A. Fasteners: Stainless steel, Type recommended by roofing manufacturer.
- B. Underlayment: ASTM D226; Type II, No. 30 unperforated asphalt felt.
- C. Slip Sheet: Rosin sized building paper.

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- D. Protective Backing Paint: Type recommended by roofing manufacturer.
- E. Sealant: Type recommended by roofing manufacturer.
- F. Plastic Cement: ASTM D4586, Type I.
- G. Gutters and Downspouts: See drawings.

## 2.4 FABRICATION

- A. Form sections shapes, accurate in size, square, and free from distortion or defects.
- B. Fabricate fascia, trim, flashing, and other metal components from same material as metal roof panels. Provide exposed metal surfaces with same finish as exposed face of metal roof panels.
- C. Fabricate cleats of same material as sheet, to interlock with sheet.
- D. Fabricate starter strips of same material as sheet, continuous, to interlock with sheet.
- E. Form pieces in single length sheets.
- F. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- G. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- J. Fabricate gutters to rectangular profile.
- K. Fabricate downspouts to profile and size indicated.
- L. Fabricate accessories in profile and size to suit gutters and downspouts.
  - 1. Anchorage Devices: Type recommended by fabricator.
  - 2. Gutter Supports: Straps
  - 3. Downspout Supports: Straps.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Metal Deck Substrate:
  - 1. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to eaves.
  - 2. Verify deck is dry. Verify substrate joints are solidly supported and fastened.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set.
- C. Verify roofing termination and base flashings are in place, sealed, and secure.

### 3.2 PREPARATION

- A. Metal Deck Substrate:
  - 1. Broom clean deck surfaces under eave protection and underlayment.
- B. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mil.

### 3.3 INSTALLATION - UNDERLAYMENT

- A. Apply underlayment over entire roof area in single layer fastened to substrate.
  - 1. Install underlayment laid perpendicular to slope.
  - 2. Weather lap edges 2 inches and nail in place.
  - 3. Stagger end joints minimum 24 inches.
- B. Apply slip sheet in one layer, laid loose.

### 3.4 INSTALLATION - STANDING SEAM METAL ROOFING

- A. Conform to SMACNA and NRCA details
- B. Terminate roofing panels with sheet metal trim and flashing for watertight installation. Close and conceal openings between roofing panels, panel seams, and roof substrate.
- C. Seal metal joints watertight.

### 3.5 INSTALLATION - SOFFIT PANELS

- A. Install perimeter trim, level and aligned with fascia.
- B. Install soffit panels to form flat, flush surface.
- C. Fit soffit panels in single length between perimeter trim.
- D. Adjust panels for uniform joints.

### 3.6 INSTALLATION - FLASHING

- A. Conform to SMACNA and NRCA details.
- B. Place eave edge and gable edge metal flashings tight to fascia. Weather lap joints 2 inches and seal with plastic cement. Secure flange to substrate.
- C. Secure flashings in place using concealed fasteners.
- D. Secure flashing exposed edges with continuous cleats maximum 24 inches on center.
- E. Apply plastic cement compound between metal flashings and felt flashings.
- F. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- G. Seal metal joints watertight.

3.7 INSTALLATION - GUTTERS AND DOWNSPOUTS

- A. Conform to SMACNA and NRCA details.
- B. Secure gutters and downspouts in place using concealed fasteners.
- C. Slope gutters minimum 1/4 inch per foot.
- D. Seal gutters watertight. Seal joint of gutter to drain.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit traffic over unprotected roof surface.

END OF SECTION

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SECTION 08 71 00  
DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes hardware for steel doors.
  - 1. Provide weather stripping and seals, and thresholds.
- B. Related Sections:
  - 1. Section 06 10 00 - Rough Carpentry.
  - 2. Section 08 12 14 - Standard Steel Frames: Silencers integral with steel frames.
  - 3. Section 08 13 14 - Standard Steel Doors.

1.2 REFERENCES

- A. American National Standards Institute:
  - 1. ANSI A156.1 - Butts and Hinges.
  - 2. ANSI A156.2 - Bored and Preassembled Locks and Latches.
  - 3. ANSI A156.3 - Exit Devices.
  - 4. ANSI A156.4 - Door Controls - Closures.
  - 5. ANSI A156.5 - Auxiliary Locks and Associated Products.
  - 6. ANSI A156.6 - Architectural Door Trim.
  - 7. ANSI A156.7 - Template Hinge Dimensions.
  - 8. ANSI A156.8 - Door Controls - Overhead Holders.
  - 9. ANSI A156.12 - Interconnected Locks and Latches.
  - 10. ANSI A156.13 - Mortise Locks and Latches.
  - 11. ANSI A156.14 - Sliding and Folding Door Hardware.
  - 12. ANSI A156.15 - Closer Holder Release Devices.
  - 13. ANSI A156.16 - Auxiliary Hardware.
  - 14. ANSI A156.18 - Materials and Finishes
  - 15. ANSI A156.19 - Power Assist and Low Energy Power Operated Doors.
  - 16. ANSI A156.23 - Electromagnetic Locks.
  - 17. ANSI A156.24 - Delayed Egress Locks.
  - 18. ANSI A156 - Complete Set of 24 BHMA Standards (A156 Series) with Binder.
- B. Builders Hardware Manufacturers Association:
  - 1. BHMA Directory of Certified Products.
- C. National Fire Protection Association:
  - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
  - 2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

- D. Underwriters Laboratories Inc.:
  - 1. UL 10B - Fire Tests of Door Assemblies.
  - 2. UL 305 - Panic Hardware.
  - 3. UL - Building Materials Directory.
- E. Intertek Testing Services (Warnock Hersey Listed):
  - 1. WH - Certification Listings.

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittals: Submittal procedures.
- B. Shop Drawings:
  - 1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts.
  - 2. Submit manufacturer's parts lists, and templates.
- C. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

### 1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of installed cylinders and their master key code.
- B. Operation and Maintenance Data: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- C. Keys: Deliver with identifying tags to Owner.

### 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following requirements:
  - 1. ANSI A156 series.
  - 2. UL 305.
- B. Perform Work in accordance with 2022 California Building Code (CBC).

### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Hardware Supplier: Company specializing in supplying commercial door hardware approved by primary hardware manufacturers.
- C. Hardware Supplier Personnel: Employ Architectural Hardware Consultant (AHC) to assist in work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually with necessary fasteners, instructions, and installation templates, when necessary; label and identify each package with door opening code to match hardware schedule.

1.8 COORDINATION

- A. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
  - 1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.
- B. Coordinate Owner's keying requirements during course of Work.

1.9 WARRANTY

- A. Furnish all individual manufacturers' extended warranties as advertised.

1.10 MAINTENANCE MATERIALS

- A. Furnish special wrenches and tools applicable for each different and for each special hardware component.
- B. Furnish maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.1 DOOR HARDWARE

- A. Hinge Manufacturers:
  - 1. Stanley Works.
  - 2. Hager Hinge Co.
  - 3. Or approved equal.
- B. Locksets, and Latch Sets Manufacturers, keyed to match Owner's existing system:
  - 1. Best Access Systems by Stanley Security Solutions.
  - 2. Mortise lockets by Corbin/Ruswin
  - 3. Or approved equal.
- C. Exit Device Manufacturers:
  - 1. Von Duprin, Inc.
  - 2. Corbin/ Ruswin.
  - 3. Precision.
  - 4. Sargent
  - 5. Or approved equal.

- D. Closers Manufacturers:
  - 1. LCN.
  - 2. Norton.
  - 3. Corbin/ Russwin.
  - 4. Or approved equal.
  
- E. Door Bolts, Coordinators, Strikes, Stops, and Holders Manufacturers:
  - 1. Ives.
  - 2. Trimco.
  - 3. Hagar.
  - 4. Rockwood.
  - 5. Dorma.
  - 6. Or approved equal.
  
- F. Weatherstripping and Threshold Manufacturers:
  - 1. Pemko Manufacturing Co.
  - 2. Reese Enterprises, Inc.
  - 3. Zero Weatherstripping, Inc.
  - 4. National Guard Products, Inc.
  - 5. Or approved equal.

## 2.2 COMPONENTS

- A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.
  - 1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
  - 2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
  - 3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
  - 4. Finish: Match hardware item being fastened.
  
- B. Hinges: ANSI A156.1, full mortise type complying with following general requirements unless otherwise scheduled.
  - 1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
  - 2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.
  - 3. Size and Weight: 4-1/2 inch heavy weight typical for 1-3/4 inch doors.
  - 4. Pins: Furnish nonferrous hinges with non-removable pins (NRP).
  - 5. Tips: Flat button.
  
- C. Locksets: Furnish locksets compatible with specified cylinders and keyed to match Owner's existing system. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames.
  - 1. Mortise Locksets: ANSI A156.13, Series 1000, Grade 1, Security Grade 1.

- D. Exit Devices: ANSI A156.3, Grade 1 concealed vertical rod type, with cross bar, unless otherwise indicated. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames, with dust-proof floor strikes.
  - 1. Types: Suitable for doors requiring exit devices.
  - 2. Locations: exist devices are required on all doors.
- E. Cylinders: ANSI A156.5, Grade 1, 6 pin type interchangeable core type cylinders.
  - 1. Keying: Key to County's existing keying system.
- F. Closers: ANSI A156.4 modern type with cover surface mounted closers; full rack and pinion type with steel spring and non-freezing hydraulic fluid.
  - 1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
  - 2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees, design with hold open points.
  - 3. Location: Mount closers on inside of exterior doors.
  - 4. Operating Pressure: Maximum operating pressure as follows.
  - 5. Interior Doors: Maximum 5 pounds.
  - 6. Exterior Doors: Maximum 8.5 pound.
  - 7. Provide manufacturer's standard 10 year warranty.
- G. Door Controls and Overhead Holders: Furnish with accessories as required for complete operational installation.
  - 1. ANSI A156.8, Grade 1.
- H. Bolts, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
  - 1. Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike, unless otherwise indicated.
  - 2. Weatherstripping: Furnish continuous weatherstripping at top and sides of exterior doors.
  - 3. Thresholds: Maximum 1/2 inch height.
  - 4. Wall Stops: ANSI A156.1, Grade 1.

### 2.3 ACCESSORIES

- A. Through Bolts: Do not permit through bolts and grommet nuts on door faces in occupied areas unless no alternative is possible.

## 2.4 FINISHING

- A. Finishes: ANSI A156.18; furnish following finishes except where otherwise indicated in Schedule at end of section.
1. Hinges:
  2. BHMA 630, satin finish.
  3. Typical Exterior Door Hardware:
  4. BHMA 630, satin finished stainless steel.
  5. Closers: Finish appearance to match door hardware on same face of door.
  6. BHMA 628, satin aluminum, clear anodized.
  7. Thresholds: Finish appearance to match door hardware on exterior face of door.
  8. BHMA 630, satin finished stainless steel.
  9. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify doors and frames are ready to receive door hardware and dimensions are as indicated on shop drawings and instructed by manufacturer.

### 3.2 INSTALLATION

- A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.
- B. Mounting Heights From Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes where not otherwise indicated.
1. Locksets: 38 inch.
  2. Dead Locks: 48 inch.
  3. Cross Bar Type Exit Devices: 38 inch.
  4. Top Hinge: Jamb manufacturer's standard, but not greater than 10 inches from head of frame to center line of hinge.
  5. Bottom Hinge: Jamb manufacturer's standard, but not greater than 12-1/2 inches from floor to center line of hinge.
  6. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.
  7. Hinge Mortise on Door Leaf: 1/4 inch. to 5/16 inch from stop side of door.

### 3.3 FIELD QUALITY CONTROL

### 3.4 ADJUSTING

- A. Adjust hardware for smooth operation.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Do not permit adjacent work to damage hardware or hardware finish.

3.6 SCHEDULES

The following hardware sets are intended to establish type and standard of quality when used together with this section requirements. Examine Drawings, Specifications, and furnish proper hardware for door openings.

<b>Hardware Set 1: All doors.</b>	
Hinges:	Full mortise hinges Hager BB1199 or Stanley FBB199
Lockset:	Mortise lock, Corbin/Ruswin ML2065, Entrance Function, keyed to match Owner's existing system.
Closer:	Surface mounted as specified.
Wall Stop:	Ives WS406-CVX or WS406-CCV.
Exit Device:	As specified.
Weatherstripping:	Reese #797W, Reese 701C, Reese 92C or similar
Automatic Door Bottom:	As specified.
Threshold:	One-piece unit as specified.

END OF SECTION

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SECTION 08 90 00  
LOUVERS AND VENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Fixed, extruded-aluminum and formed-metal louvers.

1.2 PERFORMANCE REQUIREMENTS

- A. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on tests performed according to AMCA 500-L.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, G60 zinc coating, mill phosphatized.
- D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, No. 4 finish.
- E. Fasteners: Use types and sizes to suit unit installation conditions.
1. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
  2. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.
  3. For fastening stainless steel, use 300 series stainless-steel fasteners.
  4. For color-finished louvers, use fasteners with heads that match color of louvers.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

## 2.2 FABRICATION, GENERAL

- A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- B. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer] unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

## 2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal, Drainable-Blade Louver:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Carnes Company, Inc.
    - b. Greenheck Fan Corporation.
    - c. Ruskin Company; Tomkins PLC.
  - 2. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
  - 3. Louver Performance Ratings:
    - a. Point of Beginning Water Penetration: Not less than 900 fpm.
    - b. Retain one of first two subparagraphs below. Do not specify free-area velocity in either subparagraph that is greater than point of beginning water penetration specified in last subparagraph above.
    - c. Air Performance: Not more than 0.10-inch wg static pressure drop at 700-fpm intake velocity.
    - d. Air Performance: Not more than 0.15-inch wg static pressure drop at 900-fpm free-area exhaust velocity.
  - 4. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.4 FIXED, FORMED-METAL LOUVERS

- A. Horizontal, Drainable-Blade Louver:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Air Balance Inc.; a Mestek company.
    - b. Greenheck Fan Corporation.
    - c. Ruskin Company; Tomkins PLC.
  - 2. Frame and Blade Material and Nominal Thickness: Galvanized-steel sheet, not less than 0.052 inch for frames and 0.040 inch for blades.
  - 3. Frame and Blade Material and Nominal Thickness: Stainless-steel sheet, not less than 0.050 inch.
  - 4. Louver Performance Ratings:
    - a. Point of Beginning Water Penetration: Not less than 800 fpm.

- b. Retain one of first two subparagraphs below. Do not specify free-area velocity in either subparagraph that is greater than point of beginning water penetration specified in last subparagraph above.
  - c. Air Performance: Not more than 0.10-inch wg static pressure drop at 700-fpm free-area intake velocity.
  - d. Air Performance: Not more than 0.15-inch wg static pressure drop at 900-fpm exhaust free-area velocity.
5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.5 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
- B. Louver Screen Frames: Same kind and form of metal as indicated for louver to which screens are attached.
- C. Louver Screening:
  - 1. Insect Screening: Aluminum, 24 mesh/sq. in., 0.011-inch wire.
  - 2. Insect Screening: Stainless steel, 24 mesh/sq. in., 0.006-inch wire.

## 2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
- C. High-Performance Organic Finish: 2-coat fluoropolymer finish complying with AAMA 2604 and containing not less than 50 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

## 2.7 GALVANIZED-STEEL SHEET FINISHES

- A. Finish louvers after assembly.
- B. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and repair according to ASTM A 780.
- C. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

## 2.8 STAINLESS-STEEL SHEET FINISHES

- A. Repair sheet finish by grinding and polishing irregularities, weld spatter, scratches, and forming marks to match surrounding finish.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- D. Repair damaged finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory and refinish entire unit or provide new units.
- E. Protect galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint.

END OF SECTION

## SECTION 23 05 29

### HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Metal pipe hangers and supports.
  - 2. Trapeze pipe hangers.
  - 3. Thermal-hanger shield inserts.
  - 4. Fastener systems.
  - 5. Equipment supports.

##### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for the following:
  - 1. Trapeze pipe hangers.
  - 2. Equipment supports.

##### 1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

##### 1.4 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

#### PART 2 PRODUCTS

##### 2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
  - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
  - 2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
  - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
  - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
  - 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- B. Stainless-Steel Pipe Hangers and Supports:
  - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.

2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

## 2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

## 2.3 THERMAL-HANGER SHIELD INSERTS

- A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig minimum compressive strength and vapor barrier.
- B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig minimum compressive strength.
- C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

## 2.4 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

## 2.5 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

## 2.6 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.
  - 1. Properties: Non-staining, noncorrosive, and nongaseous.
  - 2. Design Mix: 5000-psi, 28-day compressive strength.

## PART 3 EXECUTION

### 3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
  - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
  - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- D. Fastener System Installation:
  - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
  - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

- H. Install lateral bracing with pipe hangers and supports to prevent swaying.
- I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- L. Insulated Piping:
  - 1. Attach clamps and spacers to piping.
    - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
    - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
  - 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
    - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
  - 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
    - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
  - 4. Shield Dimensions for Pipe: Not less than the following:
    - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
    - b. NPS 4: 12 inches long and 0.06 inch thick.
    - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
    - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
    - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
  - 5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
  - 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

### 3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

- C. Provide lateral bracing, to prevent swaying, for equipment supports.

### 3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

### 3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

### 3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleanup and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

### 3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports and attachments for general service applications.
- F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications.
- G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.
- H. Use padded hangers for piping that is subject to scratching.
- I. Use thermal-hanger shield inserts for insulated piping and tubing.
- J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated, stationary pipes NPS 1/2 to NPS 30.
  - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
  - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
  - 4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non-insulated, stationary pipes NPS 1/2 to NPS 8.
  - 5. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
  - 6. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
  - 7. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
  - 8. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
  - 9. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
- K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.

2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
  2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
- M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
  3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  6. C-Clamps (MSS Type 23): For structural shapes.
  7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
  2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
  3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
  2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
  3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.

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- P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- Q. Use powder-actuated fasteners instead of building attachments where required in concrete construction.

END OF SECTION

## SECTION 23 05 53

### IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Equipment labels.
  2. Warning signs and labels.
  3. Duct labels.
  4. Pipe Labels.

##### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

#### PART 2 PRODUCTS

##### 2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
1. Material and Thickness: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
  2. Letter Color: White.
  3. Background Color: Black.
  4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
  6. Fasteners: Stainless-steel rivets or self-tapping screws.
  7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
  2. Letter Color: White.
  3. Background Color: Black.
  4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
  5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger

lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.

7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

## 2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Black.
- C. Background Color: Yellow.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information plus emergency notification instructions.

## 2.3 DUCT LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: White.

- C. Background Color: Black.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings; also include duct size and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions or as separate unit on each duct label to indicate flow direction.

## 2.4 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pre-tensioned Pipe Labels: Pre-coiled, semi-rigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
  - 2. Lettering Size: At least 1-1/2 inches high.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

### 3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

### 3.3 DUCT LABEL INSTALLATION

- A. Install self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
  - 1. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
- B. Locate labels near points where ducts enter into and exit from concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

### 3.4 PIPE LABEL INSTALLATION

- A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
  - 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
  - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
  - 5. Near major equipment items and other points of origination and termination.
  - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
  - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- B. Pipe Label Color Schedule:
  - 1. Engine Exhaust Pipe:
    - a. Background Color: Yellow.
    - b. Letter Color: Black.

END OF SECTION

SECTION 23 07 16  
EQUIPMENT INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes insulating the following equipment that is not factory insulated:
  - 1. Generator exhaust pipe.
  - 2. Generator muffler

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
  - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 PRODUCTS

2.1 INSULATION MATERIALS

- A. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- D. Insulation for pipe shall be manufactured in accordance with ASTM C585 for inner and outer diameters.
- E. Factory fabricated fitting covers shall be manufactured in accordance with ASTM C450.

- F. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- G. Type E-9: Mil-I-24244 and ASTM E84, Type "E" glass fibers, noncombustible, asbestos-free over a 304 Stainless Steel Knitted Mesh constructed of 0.008 inch wire with maximum temperature rating of 1500 degrees F.
  - 1. Thermal Conductivity: 0.40 at 300 degrees F.
  - 2. Service Temperature: 1200 degrees F maximum; 1000 degrees F continuous
  - 3. Density: 2 pound per cubic foot.
  - 4. Integral Jacket: Silicone Impregnated Type "E" Fiberglass Fabric Equipment Jacket: UL listed, 32 oz/sq yd
    - a. Service Temperature: 500 degrees F maximum; -80 degrees F minimum
    - b. Weave: 8 Harness Satin
- H. Wire: Kevlar thread, 35 lb. breaking strength, maximum temperature 800 degrees F.

### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

#### 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Keep insulation materials dry during application and finishing.
- G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- H. Install insulation with least number of joints practical.
- I. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

- J. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- K. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections: Inspect field-insulated equipment, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each type of equipment defined in the "Equipment Insulation Schedule" Article. For large equipment, remove only a portion adequate to determine compliance.
- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.4 EQUIPMENT INSULATION SCHEDULE

- A. Insulation materials and thicknesses are identified below.

EQUIPMENT	INSULATION TYPE	INSULATION THICKNESS inches
Generator Exhaust Piping	E-9	2.0
Generator Exhaust Muffler	E-9	2.0

END OF SECTION

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## SECTION 23 11 23

### EXHAUST PIPING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Pipes and fittings.
  - 2. Piping specialties.
  - 3. Piping and joining materials.

##### 1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
  - 1. Piping and Valves: 100 psig minimum unless otherwise indicated.

##### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For exhaust piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, and attachments of the same to building structure. Detail location of anchors and alignment guides

##### 1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Field quality-control reports.

##### 1.5 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

#### PART 2 PRODUCTS

##### 2.1 PIPES AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
  - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
  - 2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.

3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

## 2.2 PIPING SPECIALTIES

- A. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.
- B. Metal Roof Thimble: Where unit is installed indoors, provide ventilated metal thimble for all high temperature (greater than 100 degrees C) wall, ceiling and roof penetrations.

## 2.3 INSULATION

- A. Manufacturer: Unifrax Durablanket S or equal.
- B. Blanket made from spun ceramic fibers, 2-inch thick, 8 lb. per cubic foot density, with stainless steel foil jacket bonded to one side, for exterior service. Stable to 1,300 degrees F. K-Value 102 Btu-in (hr.ft.<sup>2</sup>°F).

## PART 3 EXECUTION

### 3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping free of sags and bends.
- F. Install fittings for changes in direction and branch connections.
- G. Verify final equipment locations for roughing-in.
- H. Install sleeves for piping penetrations of walls, ceilings, and floors.
- I. Install sleeve seals for piping penetrations of concrete walls and slabs.
- J. Install escutcheons for piping penetrations of walls, ceilings, and floors.

### 3.2 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:
  - 1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
  - 2. Cut threads full and clean using sharp dies.
  - 3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
  - 4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
  - 5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. Welded Joints:
  - 1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
  - 2. Bevel plain ends of steel pipe.
  - 3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

### 3.3 HANGER AND SUPPORT INSTALLATION

- A. Install seismic restraints on piping.
- B. Comply with requirements for pipe hangers and supports specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

### 3.4 CONNECTIONS

- A. Install piping adjacent to appliances to allow service and maintenance of appliances.

### 3.5 LABELING AND IDENTIFYING

- A. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for piping and valve identification.

### 3.6 FIELD QUALITY CONTROL

- A. Prepare test and inspection reports.

### 3.7 PIPING SCHEDULE

- A. Aboveground, distribution piping shall be one of the following:
  - 1. Steel pipe with malleable-iron fittings and threaded joints.
  - 2. Steel pipe with wrought-steel fittings and welded joints.

END OF SECTION

## SECTION 23 11 26

### FACILITY LIQUEFIED-PETROLEUM GAS PIPING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Pipes, tubes, and fittings.
  - 2. Piping specialties.
  - 3. Piping and tubing joining materials.
  - 4. Valves.
  - 5. Pressure regulators.
  - 6. Storage containers.

##### 1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
  - 1. For Piping Containing Only Vapor:
    - a. Piping and Valves: 125 psig unless otherwise indicated.
  - 2. For Piping Containing Liquid:
    - a. Piping between Shutoff Valves: 350 psig unless otherwise indicated.
    - b. Piping Other Than Above: 250 psig unless otherwise indicated.
    - c. Valves and Fittings: 250 psig unless otherwise indicated.
- B. LPG System Pressures within Buildings: Two pressure ranges. Primary pressure is more than 0.5 psig but not more than 2 psig and is reduced to secondary pressure of 0.5 psig or less.
- C. Seismic Performance: Storage container supports shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
  - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

##### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For facility LPG piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.

##### 1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Field quality-control reports.

## 1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

## 1.6 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

## PART 2 PRODUCTS

### 2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedules 40 and 80, Type E or S, Grade B.
  - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
  - 2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
  - 3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
  - 4. Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and PE.
    - a. Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.
- B. Corrugated, Stainless-Steel Tubing: Comply with ANSI/IAS LC 1.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. OmegaFlex, Inc.
    - b. Parker Hannifin Corporation; Parflex Division.
    - c. Titeflex.
    - d. Tru-Flex Metal Hose Corp.
  - 2. Tubing: ASTM A 240/A 240M, corrugated, Series 300 stainless steel.
  - 3. Coating: PE with flame retardant.
    - a. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      - 1) Flame-Spread Index: 25 or less.
      - 2) Smoke-Developed Index: 50 or less.
  - 4. Fittings: Copper-alloy mechanical fittings with ends made to fit and listed for use with corrugated stainless-steel tubing and capable of metal-to-metal seal without gaskets. Include brazing socket or threaded ends complying with ASME B1.20.1.
  - 5. Striker Plates: Steel, designed to protect tubing from penetrations.

6. Manifolds: Malleable iron or steel with factory-applied protective coating. Threaded connections shall comply with ASME B1.20.1 for pipe inlet and corrugated tubing outlets.
  7. Operating-Pressure Rating: 5 psig.
- C. Annealed-Temper Copper Tube: Comply with ASTM B 88, Type K.
1. Copper Fittings: ASME B16.22, wrought copper, and streamlined pattern.
  2. Flare Fittings: Comply with ASME B16.26 and SAE J513.
    - a. Copper fittings with long nuts.
    - b. Metal-to-metal compression seal without gasket.
    - c. Dryseal threads complying with ASME B1.20.3.
  3. Protective Coating for Underground Tubing: Factory-applied, extruded PE a minimum of 0.022 inch thick.
- D. PE Pipe: ASTM D 2513, SDR 11.
1. PE Fittings: ASTM D 2683, socket-fusion type or ASTM D 3261, butt-fusion type with dimensions matching PE pipe.
  2. PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D 2513, SDR 11; and steel pipe complying with ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
  3. Anodeless Service-Line Risers: Factory fabricated and leak tested.
    - a. Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet.
    - b. Casing: Steel pipe complying with ASTM A 53/A 53M, Schedule 40, black steel, Type E or S, Grade B with corrosion-protective coating covering. Vent casing aboveground.
    - c. Aboveground Portion: PE transition fitting.
    - d. Outlet shall be threaded suitable for welded connection.
    - e. Tracer wire connection.
    - f. Ultraviolet shield.
    - g. Stake supports with factory finish to match steel pipe casing or carrier pipe.
  4. Transition Service-Line Risers: Factory fabricated and leak tested.
    - a. Underground Portion: PE pipe complying with ASTM D 2513, SDR 11 inlet connected to steel pipe complying with ASTM A 53/A 53M, Schedule 40, Type E or S, Grade B, with corrosion-protective coating for aboveground outlet.
    - b. Outlet shall be threaded suitable for welded connection.
    - c. Bridging sleeve over mechanical coupling.
    - d. Factory-connected anode.
    - e. Tracer wire connection.
    - f. Ultraviolet shield.
    - g. Stake supports with factory finish to match steel pipe casing or carrier pipe.

## 2.2 PIPING SPECIALTIES

- A. Flexible Piping Joints:
1. Approved for LPG service.
  2. Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
  3. Minimum working pressure of 250 psig and 250 deg F operating temperature.

4. Threaded-end connections to match equipment connected and shall be capable of minimum 3/4-inch misalignment.
  5. Maximum 36-inch length for liquid LPG lines.
- B. Appliance Flexible Connectors:
1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
  2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
  3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
  4. Corrugated stainless-steel tubing with polymer coating.
  5. Operating-Pressure Rating: 0.5 psig.
  6. End Fittings: Zinc-coated steel.
  7. Threaded Ends: Comply with ASME B1.20.1.
  8. Maximum Length: 72 inches.
- C. Quick-Disconnect Devices: Comply with ANSI Z21.41.
1. Copper-alloy convenience outlet and matching plug connector.
  2. Nitrile seals.
  3. Hand operated with automatic shutoff when disconnected.
  4. For indoor or outdoor applications.
  5. Adjustable, retractable restraining cable.
- D. Y-Pattern Strainers:
1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
  2. End Connections: Threaded ends for NPS 2 and smaller.
  3. Strainer Screen: 40-mesh startup strainer and perforated stainless-steel basket with 50 percent free area.
  4. CWP Rating: 125 psig.
- E. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

## 2.3 JOINING MATERIALS

- A. Joint Compound and Tape: Suitable for LPG.
- B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- C. Brazing Filler Metals: Alloy with melting point greater than 1000 deg F complying with AWS A5.8/A5.8M.

## 2.4 MANUAL GAS SHUTOFF VALVES

- A. See "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles for where each valve type is applied in various services.

- B. Metallic Valves, NPS 2 and Smaller for Liquid Service: Comply with ASME B16.33 and UL 842.
  - 1. CWP Rating: 250 psig.
  - 2. Threaded Ends: Comply with ASME B1.20.1.
  - 3. Socket ends for brazed joints.
  - 4. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  - 5. Listing by CSA or agency acceptable to authorities having jurisdiction for valves 1 inch and smaller.
  - 6. Valves 1-1/4 inch and larger shall be suitable for LPG service, with "WOG" indicated on valve body.
  
- C. General Requirements for Metallic Valves, NPS 2 and Smaller for Vapor Service: Comply with ASME B16.33.
  - 1. CWP Rating: 125 psig.
  - 2. Threaded Ends: Comply with ASME B1.20.1.
  - 3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
  - 4. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  - 5. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
  - 6. Service Mark: Valves 1-1/4 inch to NPS 2 shall have initials "WOG" permanently marked on valve body.
  
- D. One-Piece, Bronze Ball Valve with Bronze Trim: MSS SP-110.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BrassCraft Manufacturing Company; a Masco company.
    - b. Conbraco Industries, Inc.; Apollo Div.
    - c. Lyall, R. W. & Company, Inc.
    - d. McDonald, A. Y. Mfg. Co.
    - e. Perfection Corporation; a subsidiary of American Meter Company.
  - 2. Body: Bronze, complying with ASTM B 584.
  - 3. Ball: Chrome-plated brass.
  - 4. Stem: Bronze; blowout proof.
  - 5. Seats: Reinforced TFE; blowout proof.
  - 6. Packing: Separate packnut with adjustable-stem packing threaded ends.
  - 7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  - 8. CWP Rating: 600 psig.
  - 9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
  - 10. Service: Suitable for LPG service with "WOG" indicated on valve body.
  
- E. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.

**Del Norte County**

**Roy Lift Station Emergency Power Project**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BrassCraft Manufacturing Company; a Masco company.
    - b. Conbraco Industries, Inc.; Apollo Div.
    - c. Lyall, R. W. & Company, Inc.
    - d. McDonald, A. Y. Mfg. Co.
    - e. Perfection Corporation; a subsidiary of American Meter Company.
  2. Body: Bronze, complying with ASTM B 584.
  3. Ball: Chrome-plated bronze.
  4. Stem: Bronze; blowout proof.
  5. Seats: Reinforced TFE; blowout proof.
  6. Packing: Threaded-body packnut design with adjustable-stem packing.
  7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  8. CWP Rating: 600 psig.
  9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
  10. Service: Suitable for LPG service with "WOG" indicated on valve body.
- F. Two-Piece, Regular-Port Bronze Ball Valves with Bronze Trim: MSS SP-110.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BrassCraft Manufacturing Company; a Masco company.
    - b. Conbraco Industries, Inc.; Apollo Div.
    - c. Lyall, R. W. & Company, Inc.
    - d. McDonald, A. Y. Mfg. Co.
    - e. Perfection Corporation; a subsidiary of American Meter Company.
  2. Body: Bronze, complying with ASTM B 584.
  3. Ball: Chrome-plated bronze.
  4. Stem: Bronze; blowout proof.
  5. Seats: Reinforced TFE.
  6. Packing: Threaded-body packnut design with adjustable-stem packing.
  7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  8. CWP Rating: 600 psig.
  9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
  10. Service: Suitable for LPG service with "WOG" indicated on valve body.
- G. Bronze Plug Valves: MSS SP-78.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Lee Brass Company.
    - b. McDonald, A. Y. Mfg. Co.
  2. Body: Bronze, complying with ASTM B 584.

3. Plug: Bronze.
4. Ends: Threaded or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
5. Operator: Square head or lug type with tamperproof feature where indicated.
6. Pressure Class: 125 psig.
7. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
8. Service: Suitable for LPG service with "WOG" indicated on valve body.

H. PE Ball Valves: Comply with ASME B16.40.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Kerotest Manufacturing Corp.
  - b. Lyall, R. W. & Company, Inc.
  - c. Perfection Corporation; a subsidiary of American Meter Company.
2. Body: PE.
3. Ball: PE.
4. Stem: Acetal.
5. Seats and Seals: Nitrile.
6. Ends: Plain or fusible to match piping.
7. CWP Rating: 80 psig.
8. Operating Temperature: Minus 20 to plus 140 deg F.
9. Operator: Nut or flat head for key operation.
10. Include plastic valve extension.
11. Include tamperproof locking feature for valves.

I. Valve Boxes:

1. Cast-iron, two-section box.
2. Top section with cover with "GAS" lettering.
3. Bottom section with base to fit over valve and barrel a minimum of 5 inches in diameter.
4. Adjustable cast-iron extensions of length required for depth of bury.
5. Include tee-handle, steel operating wrench with socket end fitting valve nut or flat head and with stem of length required to operate valve.

## 2.5 EARTHQUAKE VALVES

A. Earthquake Valves: Comply with ASCE 25.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Pacific Seismic Products, Inc.
2. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction.
3. Maximum Operating Pressure: 10 psig.
4. Cast-aluminum body with stainless-steel internal parts.
5. Nitrile-rubber, reset-stem o-ring seal.
6. Valve position, open or closed, indicator.

7. Composition valve seat with clapper held by spring or magnet locking mechanism.
8. Level indicator.
9. End Connections: Threaded for valves NPS 2 and smaller.

## 2.6 PRESSURE REGULATORS

### A. General Requirements:

1. Single stage and suitable for LPG.
2. Steel jacket and corrosion-resistant components.
3. Elevation compensator.
4. End Connections: Threaded for regulators NPS 2 and smaller.

### B. Line Pressure Regulators: Comply with ANSI Z21.80.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Actaris.
  - b. American Meter Company.
  - c. Eclipse Combustion, Inc.
  - d. Fisher Control Valves and Regulators; Division of Emerson Process Management.
  - e. Invensys.
  - f. Maxitrol Company.
  - g. Richards Industries; Jordan Valve Div.
2. Body and Diaphragm Case: Cast iron or die-cast aluminum.
3. Springs: Zinc-plated steel; interchangeable.
4. Diaphragm Plate: Zinc-plated steel.
5. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
6. Orifice: Aluminum; interchangeable.
7. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
8. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet and no pressure sensing piping external to the regulator.
9. Pressure regulator shall maintain discharge pressure setting downstream and not exceed 150 percent of design discharge pressure at shutoff.
10. Overpressure Protection Device: Factory mounted on pressure regulator.
11. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
12. Maximum Inlet Pressure: 10 psig.

### C. Appliance Pressure Regulators: Comply with ANSI Z21.18.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Canadian Meter Company Inc.
  - b. Eaton Corporation; Controls Div.
  - c. Harper Wyman Co.
  - d. Maxitrol Company.
  - e. SCP, Inc.

2. Body and Diaphragm Case: Die-cast aluminum.
3. Springs: Zinc-plated steel; interchangeable.
4. Diaphragm Plate: Zinc-plated steel.
5. Seat Disc: Nitrile rubber.
6. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
7. Factory-Applied Finish: Minimum three-layer polyester and polyurethane paint finish.
8. Regulator may include vent limiting device, instead of vent connection, if approved by authorities having jurisdiction.
9. Maximum Inlet Pressure: 13 inches wg.

## 2.7 DIELECTRIC UNIONS

### A. Dielectric Unions:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. Hart Industries International, Inc.
  - d. Jomar International Ltd.
  - e. Matco-Norca, Inc.
  - f. McDonald, A. Y. Mfg. Co.
  - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - h. Wilkins; a Zurn company.
2. Description:
  - a. Standard: ASSE 1079.
  - b. Pressure Rating: 125 psig minimum at 180 deg F.
  - c. End Connections: Solder-joint copper alloy and threaded ferrous.

## 2.8 STORAGE CONTAINERS

- ### A. Description: Factory fabricated, complying with requirements in NFPA 58 and ASME Boiler and Pressure Vessel Code and bearing the ASME label. Tanks shall be rated for 250-psig minimum working pressure.
1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. American Welding & Tank.
    - b. Hanson, Roy E. Jr. Mfg.
    - c. Trinity Industries, Inc.
    - d. United Industries Group, Inc.
  2. Liquid outlet and vapor inlet and outlet connections shall have shutoff valves with excess-flow safety shutoff valves and bypass and back-pressure check valves with smaller than 0.039-inch drill-size hole to equalize pressure. Liquid-fill connection shall have backflow check valve.
    - a. Connections: Color-code and tag valves to indicate type.
      - 1) Liquid fill and outlet, red.
      - 2) Vapor inlet and outlet, yellow.

3. Level gage shall indicate current level of liquid in the container. Gages shall also indicate storage container contents; e.g., "Butane," "50-50 LPG Mix," or "Propane."
4. Pressure relief valves, type and number as required by NFPA 58, connected to vapor space and having discharge piping same size as relief-valve outlet and long enough to extend at least 84 inches directly overhead. Identify relief valves as follows:
  - a. Discharge pressure in psig.
  - b. Rate of discharge for standard air in cfm.
  - c. Manufacturer's name.
  - d. Catalog or model number.
5. Container pressure gage.
6. For outdoor installation, exposed metal surfaces mechanically cleaned, primed, and painted for resistance to corrosion.
7. Ladders for access to valves more than 72 inches aboveground.
8. Stainless-Steel Nameplate: Attach to aboveground storage container or to adjacent structure for underground storage container.
  - a. Name and address of supplier or trade name of container.
  - b. Water capacity in gallons and liters.
  - c. Design pressure in psig.
  - d. Statement, "This container shall not contain a product having a vapor pressure in excess of 10 psig at 100 deg F."
  - e. Outside surface area in sq. ft.
  - f. Year of manufacture.
  - g. Shell thickness in inches.
  - h. Overall length in feet.
  - i. OD in feet.
  - j. Manufacturer's serial number.
  - k. ASME Code label.
9. Felt support pads and two concrete or painted-steel saddles per storage container. Corrosion protection required at container-to-felt contact.
10. Tie straps for each saddle.
11. Straps and anchors for tie-down slab.
12. Asphalt-based coating for corrosion protection.
13. Container connections and valves protected in manway at top of storage container.
14. Manway equipped with ventilation louvers.

## 2.9 LABELING AND IDENTIFYING

- A. Detectable Warning Tape: Acid- and alkali-resistant PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored yellow.

## PART 3 EXECUTION

### 3.1 EARTHWORK

- A. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

### 3.2 OUTDOOR PIPING INSTALLATION

- A. Comply with NFPA 58 and NFPA 54 requirements for installation and purging of LPG piping.
- B. Install underground, LPG piping buried at least 36 inches below finished grade. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.
  - 1. If LPG piping is installed less than 36 inches below finished grade, install it in containment conduit.
- C. Install underground, PE, LPG piping according to ASTM D 2774.
- D. Steel Piping with Protective Coating:
  - 1. Apply joint cover kits to pipe after joining to cover, seal, and protect joints.
  - 2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
  - 3. Replace pipe having damaged PE coating with new pipe.
- E. Copper Tubing with Protective Coating:
  - 1. Apply joint cover kits over tubing to cover, seal, and protect joints.
  - 2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
- F. Install fittings for changes in direction and branch connections.
- G. Install pressure gage upstream and downstream from each service regulator.

### 3.3 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of LPG piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install LPG piping at uniform grade of 2 percent down toward drip and sediment traps.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Verify final equipment locations for roughing-in.
- L. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- M. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
  - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- N. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- O. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- P. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- Q. Connect branch piping from top or side of horizontal piping.
- R. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment.
- S. Do not use LPG piping as grounding electrode.
- T. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- U. Install pressure gage upstream and downstream from each line regulator.
- V. Install sleeves for piping penetrations of walls, ceilings, and floors.

- W. Install sleeve seals for piping penetrations of concrete walls and slabs.
- X. Install escutcheons for piping penetrations of walls, ceilings, and floors.

### 3.4 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, or copper connector.
- B. Install underground valves with valve boxes.
- C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
- D. Install earthquake valves aboveground outside buildings according to listing.
- E. Install anode for metallic valves in underground PE piping.

### 3.5 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:
  - 1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
  - 2. Cut threads full and clean using sharp dies.
  - 3. Ream threaded pipe ends to remove burrs and restore full ID of pipe.
  - 4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
  - 5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. Welded Joints:
  - 1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
  - 2. Bevel plain ends of steel pipe.
  - 3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Ch. 22, "Pipe and Tube."
- F. Flared Joints: Cut tubing with roll cutting tool. Flare tube end with tool to result in flare dimensions complying with SAE J513. Tighten finger tight, then use wrench. Do not overtighten.
- G. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.

1. Plain-End Pipe and Fittings: Use butt fusion.
2. Plain-End Pipe and Socket Fittings: Use socket fusion.

### 3.6 HANGER AND SUPPORT INSTALLATION

- A. Install seismic restraints on piping.
- B. Comply with requirements for pipe hangers and supports specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."
- C. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
  1. NPS 1 and Smaller: Maximum span, 96 inches; minimum rod size, 3/8 inch.
  2. NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.
  3. NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
- D. Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes:
  1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
  2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.
  3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod, 3/8 inch.

### 3.7 CONNECTIONS

- A. Connect to utility's gas main according to utility's procedures and requirements.
- B. Install LPG piping electrically continuous and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
- C. Install piping adjacent to appliances to allow service and maintenance of appliances.
- D. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliances and equipment. Install union between valve and appliances or equipment.
- E. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

### 3.8 STORAGE CONTAINER INSTALLATION

- A. Fill storage container to at least 80 percent capacity with propane.
- B. Install piping connections with swing joints or flexible connectors to allow for storage container settlement and for thermal expansion and contraction.
- C. Ground containers according to NFPA 780.
- D. Set storage containers in felt pads on concrete or steel saddles. Install corrosion protection at container-to-felt contact.
- E. Install tie-downs over storage containers on saddles with proper tension.

- F. Set concrete saddles on dowels set in concrete base. Anchor steel saddles to concrete base.
- G. Set storage container on concrete ballast base large enough to offset buoyancy of empty storage container immersed in water.
- H. Install tie-down straps over container anchored in ballast base and repair damaged coating.
- I. Backfill with a minimum coverage for underground or mounded storage containers according to NFPA 58.
- J. Backfill with pea gravel.
- K. Install cathodic protection for storage container.

### 3.9 LABELING AND IDENTIFYING

- A. Comply with requirements in Division 23 Section "Identification for HVAC Piping and Equipment" for piping and valve identification.
- B. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.10 FIELD QUALITY CONTROL

- A. Test, inspect, and purge LPG according to NFPA 58 and NFPA 54 and requirements of authorities having jurisdiction.
- B. LPG piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

### 3.11 OUTDOOR PIPING SCHEDULE

- A. Underground LPG liquid piping shall be one of the following:
  - 1. Schedule 40 steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
  - 2. Annealed-temper copper tube, Type K with wrought-copper fittings and brazed joints. Coat pipe and fittings with protective coating for copper tubing.
- B. Aboveground LPG liquid piping shall be one of the following:
  - 1. NPS 2 and Smaller: Schedule 80 steel pipe, malleable-iron threaded fittings and threaded joints. Coat pipe and fittings with protective coating for steel piping.
  - 2. Annealed-temper copper tube, Type L, with wrought-copper fittings and brazed joints. Coat pipe and fittings with protective coating for copper tubing.
- C. Underground LPG vapor piping shall be one of the following:
  - 1. PE pipe and fittings joined by heat-fusion; service-line risers with tracer wire terminated in an accessible location.

2. Schedule 40, steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
  3. Annealed-temper copper tube, Type L with wrought-copper fittings and brazed joints. Coat pipe and fittings with protective coating for copper tubing.
- D. Aboveground LPG vapor piping shall be one of the following:
1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
  2. Schedule 40, steel pipe with wrought-steel fittings and welded joints.
  3. Annealed-temper copper tube, Type L, with wrought-copper fittings and brazed joints. Coat pipe and fittings with protective coating for copper tubing.
- E. Containment Conduit: Schedule 40, steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.

### 3.12 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG

- A. Aboveground, branch piping NPS 1 and smaller shall be one of the following:
1. Corrugated stainless-steel tubing with mechanical fittings having socket or threaded ends to match adjacent piping.
  2. Annealed-temper copper tube with wrought-copper fittings and brazed joints.
  3. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
- B. Aboveground, distribution piping shall be one of the following:
1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
  2. Schedule 40, steel pipe with wrought-steel fittings and welded joints.
- C. Underground, below building, piping shall be one of the following:
1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
  2. Schedule 40, steel pipe with wrought-steel fittings and welded joints.
- D. Containment Conduit: Schedule 40, steel pipe with wrought-steel fittings and welded joints. Coat pipe and fittings with protective coating for steel piping.
- E. Containment Conduit Vent Piping: Schedule 40, steel pipe with malleable-iron fittings and threaded or wrought-steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

### 3.13 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES MORE THAN 0.5 PSIG AND LESS THAN 5 PSIG

- A. Aboveground, branch piping NPS 1 and smaller shall be one of the following:
1. Corrugated stainless-steel tubing with mechanical fittings having socket or threaded ends to match adjacent piping.
  2. Annealed-temper copper tube, Type L with wrought-copper fittings and brazed joints.
  3. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
- B. Aboveground, distribution piping shall be one of the following:
1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
  2. Schedule 40, steel pipe with steel welding fittings and welded joints.

- C. Underground, below building, piping shall be one of the following:
  - 1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
  - 2. Schedule 40, steel pipe with wrought-steel fittings and welded joints.
- D. Containment Conduit: Schedule 40, steel pipe with wrought-steel fittings and welded joints. Coat underground pipe and fittings with protective coating for steel piping.
- E. Containment Conduit Vent Piping: Schedule 40, steel pipe with malleable-iron fittings and threaded or wrought-steel fittings with welded joints. Coat underground pipe and fittings with protective coating for steel piping.

### 3.14 UNDERGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

- A. Connections to Existing Gas Piping: Use valve and fitting assemblies made for tapping utility's gas mains and listed by an NRTL.
- B. Underground Vapor Piping: PE ball valve.

### 3.15 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

- A. Aboveground Liquid Piping:
  - 1. Two-piece, full-port, bronze ball valves with bronze trim.
- B. Valves for pipe NPS 2 and smaller at service meter shall be one of the following:
  - 1. One-piece, bronze ball valve with bronze trim.
  - 2. Two-piece, full-port, bronze ball valves with bronze trim.
  - 3. Bronze plug valve.
- C. Distribution piping valves for pipe NPS 2 and smaller shall be one of the following:
  - 1. One-piece, bronze ball valve with bronze trim.
  - 2. Two-piece, full-port, bronze ball valves with bronze trim.
  - 3. Bronze plug valve.
- D. Valves in branch piping for single appliance shall be one of the following:
  - 1. One-piece, bronze ball valve with bronze trim.
  - 2. Two-piece, full-port, bronze ball valves with bronze trim.
  - 3. Bronze plug valve.

END OF SECTION

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SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 WORK NOT INCLUDED

- A. Cooperate with the other trades who may or may not be party to this Contract for the purpose of coordinating the electrical requirements and installation of equipment, materials, and furnishings provided by those other trades, including the Owner.

1.2 CODES AND STANDARDS

- A. Provide equipment and materials which conform to, and perform the installation thereof in accordance with the following codes and industry standards:
  - 1. California Electrical Code (CEC).
  - 2. National Electrical Code (NEC)
  - 3. California Building Code (CBC)
  - 4. California Fire Code (CFC)
  - 5. Titles 8, 19 and 24 of the California Code of Regulations (CCR).
  - 6. American National Standards Institute (ANSI).
  - 7. California State Fire Marshal (CSFM).
  - 8. Underwriters' Laboratories (UL).
  - 9. National Electrical Manufacturers' Association (NEMA).
  - 10. Institute of Electrical and Electronics Engineers (IEEE).
  - 11. National Electrical Safety Code (NESC).
    - a. Electrical Safety Orders.
  - 12. Other applicable local codes and ordinances.
- B. Where the authority-having-jurisdiction makes an interpretation or decision, as is their prerogative in accordance with the Code, such direction shall be considered a part of these Contract Documents as if contained herein. With respect to completing the intent of the Contract Documents, comply with any and all requirements of the authority-having-jurisdiction and utility company field inspectors, at no additional cost.
- C. The above referenced codes and standards are considered to be absolute minimum requirements. The Drawings and Specifications shall take precedence over the above referenced codes and standards where materials or workmanship of higher quality or larger size is indicated. Nothing in these Drawings or Specifications shall be construed to allow work not conforming to the applicable codes and standards.

1.3 UTILITY FEES

- A. Pay utility company charges for normal or after hours shutdowns, service calls, repairs, and cable locating that are directly related to the installation of the Electrical Work.

#### 1.4 WORKING SPACE

- A. Maintain adequate work space around, and access to, electrical and mechanical equipment in strict accordance with the applicable Codes. Verify during the course of construction that sufficient space will be available for the installation and maintenance of equipment, fixtures, etc.

#### 1.5 MATERIALS AND SUBSTITUTIONS

- A. Specific trade names are used in the Drawings and Specifications in order to establish the standard grade and characteristics of said items. This does not imply the right upon the part of the Contractor to use other materials or methods without the approval of the Owner.
- B. Electrical materials and equipment shall bear the label of, or be listed by, the Underwriters' Laboratories (UL) wherever standards have been established and label service is regularly furnished by that agency. Comply with the installation and application requirements of UL as documented in their published directories.
- C. Maintain uniformity throughout the Project by making use of only one make or brand of material for each material used.

#### 1.6 ELECTRICAL SUBMITTALS

- A. Shop Drawings for equipment and materials as noted in each Division 26 specification section. Bind the submittals as complete volumes according to classification of equipment such as power, lighting, fire alarm, etc. When possible, make all electrical submittals at the same time.
- B. Arrange panelboard submittals to show bussing, circuit numbering, and branch circuit protective devices similar the schedules as indicated. Show elevations of switchboards, motor control centers, and distribution centers indicating the layout of devices, meters, handles, etc. Provide device ratings, circuit numbers, and nameplate descriptions in table form. Include terminal strip mounting arrangements on elevations for terminal cabinets.
- C. Submit test reports as noted in each Division 26 specification section.

#### 1.7 DRAWINGS AND SPECIFICATIONS

- A. The data and information contained on the Drawings is as accurate as was reasonably possible at the time they were produced, but absolute accuracy is not guaranteed. Exact locations, distances, elevations, etc., will be dictated by the actual building and the conditions at the site.
- B. The layout of electrical equipment, wiring, and accessories is shown in a diagrammatic fashion (not pictorially) in order to achieve clarity and legibility. Although the size and location of electrical equipment is drawn to scale wherever possible, refer to all data in the Contract Documents and field verify this information as the project progresses. Examine architectural, structural, mechanical, and other drawings

to determine the exact location of conduits, outlets, fixtures, and equipment and to note any conditions which may affect the electrical work.

- C. Because the Electrical Drawings may be distorted for clarity of representation, it may be necessary to field verify the exact location of electrical outlets, lights, switches, etc. in order to conform to the architectural elements. The Owner reserves the right to make minor changes to the locations of equipment, devices, and wiring shown, at no additional cost, providing the changes are ordered before the rough-in of conduit, boxes, or related items is completed, and no extra material are required.
- D. Conduit quantities, sizes, termination points, and wiring are indicated. However, not all conduit bends or routing details are indicated. Route conduit so as to conform to the structural conditions, avoid obstructing other trades, maintain space restrictions and keep circulation areas and access openings clear.

#### 1.8 Workmanship

- A. Constantly supervise the work personally or through an authorized and competent representative. Keep the same foreman or supervisor on the project from commencement through completion.

#### 1.9 MANUFACTURER'S DIRECTIONS

- A. Adhere to the manufacturer's directions regarding the proper installation and configuration of electrical equipment where those directions cover points not included in these Drawings and Specifications.

#### 1.10 PROTECTION AND STORAGE

- A. Deliver electrical materials to the site new, and in unbroken packages. Protect electrical equipment and materials during transit, storage and handling to prevent damage, soiling and deterioration.
- B. During shipping storage and handling protect electrical materials from damage of any type including dust, water, over-spray, and temperature. Avoid damage during construction to the work and materials of other trades as well as the electrical work and material. Repair or replace, at the Contractor's expense, defective or damaged items such that the entire Work is completed in a condition satisfactory to the Owner.

#### 1.11 EXCAVATION, CUTTING, PATCHING, AND REPAIR

- A. Perform excavation and backfill required for the installation of electrical sub-structures. Restore grounds, walkways, roadways, curbs, walls, and other existing underground facilities to their original condition.
- B. Cut, core-drill, and demolish existing walls, floors, ceilings and other building surfaces as required for the installation of Electrical Work. Obtain the approval of the Owner prior to performing any operation which may affect any structural elements of the building.

- C. Patch and repair wood, plaster, tile, or concrete surfaces which have been damaged by the installation of the Electrical Work so that the finished surface matches the surrounding conditions.

#### 1.12 FLASHING, WATERPROOFING AND SEALING

- A. In general, install in an approved watertight manner, Electrical Work which pierces exterior walls or waterproofing membranes. Flash and counter-flash roof and wall penetrations in a manner described in other applicable sections of this Specification and as approved by the Owner.
- B. Fit conduits passing through finished walls with steel escutcheon plates of brass, chrome, or painted finish as directed by the Owner. Grout penetrations of floor slabs, concrete or masonry walls with an approved grout or silicone elastomeric caulk.

#### 1.13 CLEANING, ADJUSTING, AND TOUCH-UP

- A. Remove on a daily basis electrical debris, scraps, packaging material and other rubbish. Dispose of such items off-site in an approved manner and debris. Maintain the site free from physical hazards at all times in accordance with OSHA regulations.
- B. After installation, completely clean electrical equipment, fixtures, and materials of excess paint, over-spray, plaster, cement, insulating products, and other foreign matter. Leave the Electrical Work in a clean, finished, dry, level, like new condition.
- C. Touch-up paint scratches and scuffs on electrical equipment and lighting fixtures with paint recommended by the manufacturer and matching the original item finish.
- D. Make setting, adjustments, and programming in accordance with the manufactures' operating and installation instructions. Settings and program variables will be issued by the Owner prior to commissioning of the electrical system.

#### 1.14 AS-BUILT DRAWINGS

- A. Throughout the project, maintain accurate and current record documents. Show on the record drawings deviations from the Electrical Drawings, locations of underground conduits and pull-boxes, and concealed equipment which is not readily apparent. Dimension the record drawings using permanent, readily identified benchmarks such as column or wall lines.

#### 1.15 INSPECTIONS AND TESTING

- A. Arrange for the inspection of the Work at various stages of completion by the Authority Having Jurisdiction, utility company representatives, and the Owner. Comply with all directions and remedial measures issued thereby. Any objections to these orders on the part of the Contractor must be presented to the Owner in writing within forty eight (48) hours of the inspection report.
- B. Coordinate the installation of the Work so that observation of all rough-in, concealed, or underground Work can take place by the Owner. Provide a minimum of seventy two (72) hours notice to the Owner prior to covering up the work. Uncover Work that

has not been properly observed and make repairs to restore the Work and adjoining surfaces to their proper condition at no additional cost.

- C. Perform tests of the electrical system during the course of the project and at project completion to ensure safe and proper function in accordance with the Contract Documents, manufacturers' recommendations, and applicable codes. Testing shall include, but not necessarily be limited to, the following:
1. Test for short circuits, open circuits, neutral leakage, and improper grounds on feeders and branch circuits. Perform this test with mains in disconnect from feeders, branch circuits closed, fixtures and devices permanently connected, lamps removed from sockets and wall switches closed.
  2. Provide insulation resistance tests of all phase and neutral circuit conductors using a 500 Volt Megger for circuits of 240 Volt rating and below, and a 1000 Volt Megger for circuits of 277 volts and above. Minimum acceptable insulation resistance is one (1) megohm.
  3. Perform a ground resistance test of each main grounding electrode system, ground rod, and supplemental grounding electrode. Utilize a calibrated, direct reading, earth ground test set and make the tests using the "Three-terminal, Fall-of-Potential" method. The maximum allowable earth ground resistance is 25 ohms.
  4. Test for proper phase-to-phase and phase-to-neutral operating voltage on the main service and on each separately derived system. Perform this test at full load and at no load. With all circuits at full operating conditions, test the phase and neutral load currents using a clamp-on ammeter.
  5. Tests as required by other sections of these Specifications.
  6. Tests as prescribed by individual equipment manufacturers whether or not described in these Specifications.
- D. Demonstrate to the Owner that the entire installation is complete, in proper operation condition. Activate all circuits, lights, devices, and controls under full load and normal operating conditions. Identify faulty items and immediately replace or repair defective equipment, workmanship, and materials to like new condition and retest in the presence of the Owner.
- E. Demonstrate to the Owner that the entire electrical system is free from short circuits and improper grounds, or upon request of the Owner anytime, make necessary tests under the observation of the Owner which will ensure that electrical equipment, materials and installation methods are as specified.

#### 1.16 WARRANTIES, CERTIFICATES, AND OPERATING MANUALS

- A. Properly fill out and deliver to the Owner, all warranties, guarantees, certificates, etc. for equipment and materials. The effective date on each item shall be the date of acceptance of the work by the Owner.

#### PART 2 PRODUCTS

NOT USED.

**Del Norte County**  
Roy Lift Station Emergency Power Project

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes building wire and cable, service entrance cable, control cables, wiring connectors and connections.
- B. All circuit wiring and cables shall be installed in conduit. This includes power, lighting, fire alarm, and security cables. Data cables may be installed open above suspended ceilings provided they are bundled and supported from structure in a clean and workmanlike manner.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. ASTM B 3 Soft or Annealed Copper Wire
- B. ASTM B 496 Compact Round Concentric-Lay-Stranded Copper Conductors
- C. ASTM B 8 Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
- D. ANSI C 2 National Electrical Safety Code – latest edition
- E. IEEE 242 Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
- F. IEEE 399 Recommend Practice for Industrial and Commercial Power System Analysis.
- G. NECA (National Electrical Contractors Association) - Standard of Installation.
- H. NEMA WC-26 Wire and Cable Packaging
- I. NETA ATS National Electrical Testing Association Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- J. NFPA 70 National Electrical Code – latest edition.
- K. UL 83 Thermoplastic-Insulated Wires and Cables.
- L. UL 486A Wire Connectors and Soldering Lugs for Use with Copper Conductors.
- M. UL 510 Polyvinyl Chloride, Polyethylene and Rubber Insulating Tapes.

### 1.3 SYSTEM DESCRIPTION

- A. The applications for required cable, wire, and connectors include, but are not limited to:
  - 1. Power distribution circuitry.
  - 2. Lighting circuitry.
  - 3. Appliance and equipment circuitry.
  - 4. Wiring for motors of mechanical equipment
  - 5. Wiring from the motor(s) of mechanical equipment to the disconnect switches or junction boxes, including wiring for pushbuttons, pilot lights, interlocks and similar devices as directed, shown, or specified.
  - 6. Wiring from the motors of mechanical equipment to motor starters, including other auxiliary wiring as may be required, directed, or shown.
  - 7. Line voltage wiring as required by other Divisions interlocking to motor starters.
  - 8. Control wiring for motors, mechanical equipment, relays and switches, and similar mechanical-electrical devices.
  - 9. Line voltage wiring to thermostats, alarm system components, security system components and other miscellaneous equipment.

### 1.4 PROJECT CONDITIONS

- A. All wire and cables shall be minimum No. 12 AWG copper conductor unless otherwise indicated.
- B. All conductor sizes are based on copper.
- C. Wire and cable routing indicated is diagrammatic unless dimensioned.
- D. Route wire and cable as required to complement project conditions.
- E. The Contractor shall be responsible for any and all raceways and raceway/cable supports in accordance with all other sections of these Specifications.

### 1.5 REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

### 1.6 CONTRACTOR SUBMITTALS

- A. Product Data:
  - 1. Submit manufacturer's catalog cuts and technical data for building wire and cables.
- B. Field Test Report:
  - 1. Measure overall insulation resistance to ground. Provide certified test report.

### 1.7 CLOSEOUT SUBMITTALS

- A. Submit final certified test reports of all insulation resistance tests.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Accept cable and accessories on site in manufacturer's packaging. Inspect for damage.
- B. Store and protect cable and accessories from the environment in accordance with manufacturer's published instructions. Provide adequate heating and ventilation to prevent condensation.
- C. Damaged items shall be replaced at no additional cost to Owner.

## 1.9 COORDINATION

- A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
- B. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 feet of length shown.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS:

- A. Building Wire and Cable
  - 1. American Wire and Cable.
  - 2. Cerro Wire and Cable Co.
  - 3. General Cable Corp.
  - 4. Okonite Co.
  - 5. Approved Equal.

### 2.2 BUILDING WIRE AND CABLE

- A. Building wire and cable shall be UL83 compliant, insulated, single conductor, copper, solid or stranded, rated for 600-volts AC. The insulation shall be thermoplastic material rated for 90 degrees Celsius, THW, THHN/THWN, RHW or XHHW, per ANSI/NFPA 70.
- B. For Interior Dry Location: Use only building wire, THHN/THWN insulation rated 90 degree Celsius, in raceway.
- C. For Exterior Wet or Dry Locations: Use only XHHW insulation rated for 90 degree Celsius, in raceway.
- D. For Underground Dry or Wet Locations: Use only XHHW insulation rated 90 degree Celsius, in raceway.
- E. For connections to electrical equipment, coordinate wire type with equipment manufacturer.

## 2.3 SERVICE ENTRANCE CABLES

- A. Service entrance cables shall be insulated, single conductor, copper, stranded, rated for 600-volts AC, type XHHW insulation.
- B. Overhead Service entrance cables shall be insulated, single conductor, copper, stranded, rated for 600-volts AC, type SE insulation.

## 2.4 WIRING CONNECTORS

- A. Split Bolt Connectors:
  - 1. FCI Burndy Corp.
  - 2. Cooper Crouse Hinds.
  - 3. O.Z./Gedney Co.
  - 4. Thomas & Betts Co.
  - 5. 3-M Co.
  - 6. Approved Equal.
- B. Solderless Pressure Connectors:
  - 1. FCI Burndy Corp.
  - 2. Ideal Industries Co.
  - 3. Thomas & Betts Co.
  - 4. 3-M Co.
  - 5. Approved Equal.
- C. Spring Wire Connectors:
  - 1. Ideal Industries Co.
  - 2. 3-M Co.
  - 3. Approved Equal.
- D. Compression Connectors:
  - 1. FCI Burndy Corp.
  - 2. Thomas & Betts Co.
  - 3. 3-M Co.
  - 4. Approved Equal.

## 2.5 WIRE COLOR CODE

- A. Color-code all conductors:
  - 1. Wire sizes No. 10 AWG and smaller shall have integral color-coded insulation.
  - 2. Wire sizes No. 8 AWG and larger may have black insulation but shall be identified by color-coded electrical tape at all junction, splice, pull, or termination points.
  - 3. Color tape shall be applied to at least 3 inches of the conductor at the termination ends and in junction or pull boxes or where readily accessible.
  - 4. Conductors for all systems shall not change color at splice points.
  - 5. Where there are two or more neutrals in one conduit, each shall be individually identified with the proper circuit.
  - 6. For No. 4 AWG and larger ground conductors, identify with green tape at both ends and all visible points, included in all junction boxes.

- B. Each phase wire shall be uniquely color-coded as indicated below:
  - 1. 120/240-Volts
    - a. Phase A – Black
    - b. Phase B – Red
    - c. Neutral - White
    - d. Ground - Green
  - 2. 120/208-Volts
    - a. Phase A – Black
    - b. Phase B – Red
    - c. Phase C – Blue
    - d. Neutral – White
    - e. Ground – Green
  - 3. 277/480-Volts
    - a. Phase A - Brown
    - b. Phase B - Orange
    - c. Phase C – Yellow
    - d. Neutral - White or Natural Gray
    - e. Ground – Green
  - 4. Isolated Grounds: Green with Yellow Stripes

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire and cable has been completed.
- C. Verify that raceway installation is complete and supported as required by the specifications.

### 3.2 PREPARATION

- A. Test raceway with a mandrel and thoroughly swab out to remove foreign material before pulling cables.
- B. For conduits sizes less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel.
- C. For conduits sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. Then draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel.

### 3.3 EXISTING WORK

- A. Disconnect and remove exposed and/or abandoned wire and cable. Patch surfaces where removed cable pass through building finishes.

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- B. Disconnect abandoned circuits and remove wire and cable. Remove abandoned boxes if wire and cable servicing them is abandoned and/or removed. Provide blank cover for abandoned boxes that are not removed.
- C. Ensure access to existing wiring connections which remain active and which require access. Modify installation or provide access panel as appropriate.
- D. Extend existing circuits using materials and methods and compatible with existing electrical installations, or as otherwise specified.
- E. Tag and repair existing wire and cable that remain or are being reused.

**3.4 INSTALLATION**

**A. General:**

- 1. Install wire and cable in accordance with manufacturer's instructions and NECA "Standard of Installation".
- 2. Route wire and cable as required to meet project conditions.
- 3. Identify and color code wire and cable. Identify each conductor with its circuit number or other designation indicated.
- 4. Protect exposed cable from damage.
- 5. Pull all conductors into raceway at same time.
- 6. Use suitable wire pulling lubricant for building wire No. 4 AWG and larger. Lubricant shall not be deleterious to the cable sheath, jacket or outer covering.
- 7. Do not exceed cable manufacturer's recommended pulling tension limits when installing wire or cable.
- 8. Support cables above accessible ceiling using standard support methods to support cables from structure. Do not rest cable on ceiling panels.
- 9. Neatly train and lace wiring inside boxes, equipment, and panelboards

**B. Cable and Wire Size:**

- 1. Conductor sizes are based on copper unless specifically indicated as aluminum or "AL".
- 2. Use conductor no smaller than No. 12 AWG for power and lighting circuits.
- 3. Use conductor no smaller than No. 14 AWG for control circuits.
- 4. Use No. 10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.
- 5. Use No. 10 AWG conductors for 20 ampere, 277-volt branch circuits longer than 200 feet.
- 6. Use stranded conductor for all feeders, branch and control circuits.

**C. Cable Identification**

- 1. Identify all wires and cables as specified in other Sections of these Specifications.

**D. Special Techniques - Wiring Connections:**

- 1. Clean conductor surfaces before installing lugs and connectors. Where an anti-oxidation lubricant is used, apply liberally, coating all exposed conductor surfaces.
- 2. Use suitable cable fittings and connectors.

3. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
4. Use split bolt connectors for copper conductor splices and taps, No. 8 AWG and larger.
5. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, No. 8 AWG and smaller.
6. Tape un-insulated conductors and connector with two layers of half-lapped rubber insulating compound tape and two layers of half-lapped, 7-mil electrical tape, Scotch 33+, or approved equal.
7. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, No. 10 AWG and smaller.
8. Stranded conductors for control circuits shall have ring terminals crimped on for all device terminations. Bare stranded conductors shall not be placed directly under the screws.

### 3.5 FIELD QUALITY CONTROL

- A. Field inspection and test shall be performed under provisions of NETA ATS section 7.3 (2) - Low Voltage Cables, 600-Volt Maximum as follows.
  1. Visual and Mechanical Inspection:
    - a. Compare cable data with drawings and specifications.
    - b. Inspect exposed sections of cable for physical damage and correct connection in accordance with single-line diagram.
    - c. Inspect all bolted electrical connections for high resistance using one of the following methods:
      - 1) Use of low-resistance ohm-meter in accordance with NETA section 7.3.2.2 (Electrical Tests).
      - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data from NETA ATS Table 10.12.
    - d. Inspect compression-applied connectors for correct cable match and indentation.
    - e. Verify cable color coding with applicable specifications and National Electrical Code.
  2. Electrical Tests
    - a. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Test duration shall be one minute.
    - b. Perform resistance measurements through all bolted connections with low-resistance ohmmeter, if applicable, in accordance with Section 7.3.2.1 (Visual and Mechanical Inspection).
    - c. Perform continuity test to insure correct cable connection.
    - d. Correct malfunctions and/or deficiencies immediately as detected at no additional cost to the Owner, including additional verification testing.
    - e. Subsequent to final wire and cable terminations, energize all circuitry and demonstrate functional adequacy in accordance with system requirements.
  3. Test Values
    - a. Compare bolted connection resistance to values of similar connections.

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- b. Bolt-torque levels should be in accordance with NETA ATS Table 10.12 unless otherwise specified by the manufacturer.
- c. Micro-ohm or milli-volt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate any values which deviate from similar connections by more than 50 percent of the lowest value.
- d. Minimum insulation-resistance values should not be less than 50 meg-ohms.
- e. Investigate deviations between adjacent phases.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Scope of work for this project:
  - 1. Provision of a new generator system grounding.
- B. This section includes:
  - 1. Furnishing of grounding electrodes and conductors; equipment grounding conductors; bonding methods and materials; conduit and equipment supports; anchors and fasteners; sealing and fireproofing of sleeves and openings between conduits and wall.
  - 2. Inspection and testing of the Grounding and Bonding System.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The standards referenced herein, except as modified in the Contract Documents, shall have full force and effect as though included in these Specifications. These standards are not furnished to the Contractor since manufacturers and trades involved are assumed to be familiar with these requirements. The Contractor shall obtain copies of reference standards direct from publication sources as needed for proper performance and completion of the work.
  - 1. ASTM B 187 Specifications for Copper Bus, Rod, and Shapes.
  - 2. ASTM A 653 Standard Specifications for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by Hot Dip Process
  - 3. IEEE 142 Recommended Practice for Grounding of Industrial and Commercial Power Systems.
  - 4. IEEE 1100 Recommended Practice for Powering and Grounding Electronic Equipment.
  - 5. NECA (National Electrical Contractors Association) – Standard of Installation.
  - 6. NETA ATS Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
  - 7. NFPA 70 National Electrical Code (NEC). Latest edition adopted by the State of California (CEC).
  - 8. UL 467 Electrical Grounding and Bonding Equipment.

1.3 SYSTEM DESCRIPTION

- A. Grounding electrode system consist of the following elements:
  - 1. Metal underground water pipe
  - 2. Metal frame of the building
  - 3. Concrete encased electrode
  - 4. Rod electrodes

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5. Service equipment
6. Enclosures
7. Separately derived systems.

B. Anchor and fasten electrical products to building elements and finishes as follows:

1. Concrete Structural Elements: Provide preset inserts.
2. Concrete Surfaces: Provide epoxy or expansion anchors.
3. Interior Structural Steel: Provide appropriate size beam clamps.
4. Solid Masonry Walls: Use expansion anchors and preset inserts.
5. Sheet Metal: Provide sheet metal screws.

**1.4 DESIGN REQUIREMENTS**

- A. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, acceptable testing and listing agencies as suitable for purpose specified and shown.
- B. Grounding shall be in accordance with the National Electrical Code (NEC). Where size, type, rating and quantities indicated or specified are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.
- C. Select materials, sizes, and types of anchors, fasteners, and supports to carry at least twice the loads of equipment and raceway, including weight of wire and cable in raceway.

**1.5 SUBMITTALS**

- A. Product Data:
  1. Grounding electrodes and connections for fastening components.

**1.6 CLOSEOUT SUBMITTALS**

- A. Record actual locations of components and grounding electrodes.
- B. Submit 1 copy of the test reports of all grounding tests and ground-fault protection systems.

**1.7 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.
- B. Field testing shall be performed by a third party testing firm with certification from a recognized testing agency, with a minimum of five (5) years of testing experience.

## PART 2 PRODUCTS

### 2.1 GROUNDING SYSTEM

- A. Except as indicated elsewhere, provide materials for electrical grounding system, including, but not limited to, cables, wires, connectors, terminals (solderless lugs) and exothermic welds, grounding rods and electrodes, bonding jumper and braided straps, and other items and accessories required for a complete installation. Where more than one type of material or equipment meets indicated requirements, selection shall be at Contractor's option. Where materials or components are not otherwise indicated, provide products as recommended by the accessories manufacturers and in compliance with the NEC and established industry standards.
- B. All grounding materials required shall be furnished new and undamaged in accordance with the requirements of these specifications:

### 2.2 WIRE

- A. Service Equipment Grounding Electrode Conductor: Bare, soft-drawn copper, Class AA stranding, ASTM B 8. Size per NEC Table 250-66, unless otherwise noted.
- B. Electrical Equipment Grounding Conductor: Insulated, soft-drawn copper, Class B stranding or solid, with green colored polyvinyl chloride insulation per Section 16123. Size per NEC Article 250-122, unless otherwise noted.

### 2.3 BUS AND BARS

- A. Silver plated, soft copper with cross section not less than 1 square inch per 1,000 ampere rating, but in no case less than 1/4-inch thick by 1-inch wide, ASTM B 187. Rating shall be per the NEC, unless otherwise noted.

### 2.4 EXOTHERMIC WELD CONNECTIONS

- A. Exothermic materials, accessories and tools for preparing and making permanent field connections between grounding system components. Molds, cartridges, materials, and accessories as recommended by the manufacturer of the molds for the items to be welded.
- B. Manufacturer:
  - 1. Cadweld (Erico Products) "Exolon" Low Emission. Molds and powder shall be furnished by the same manufacturer.
  - 2. Approved equal.

### 2.5 MECHANICAL CONNECTORS

- A. Mechanical connectors shall be permitted only when exothermic weld connections are not suitable or recommended by the manufacturer.
- B. Bolt-on bronze connectors, suitable for grounding and bonding applications in configurations required for the particular installation.

- C. Manufacturer
  - 1. Burndy Corp.
  - 2. Anderson
  - 3. Thomas & Betts
  - 4. 3-M Co.
  - 5. Approved Equal

## 2.6 FLUSH GROUND PLATES

- A. Cadweld B-162 series, B-164 series, or approved equal.

## 2.7 FLEXIBLE JUMPER STRAP

- A. Flexible flat conductor, 480 strands of 30-gauge, bare copper wire; 3/4-inch width, 9-1/2-inch-long; 48.25 kcMil, minimum. Protect braid with copper bolt-hole ends with holes sized for 3/8-inch diameter bolts.

## 2.8 BONDING PLATES, CONNECTIONS, TERMINALS AND CLAMPS

- A. Provide electrical bonding plates, connectors, terminals and clamps, and accessories as recommended by the manufacturer for the specific applications. Components shall be high-strength, high-conductivity copper alloy.

## 2.9 UFER GROUND

- A. In accordance with the National Electrical Code.

## 2.10 ROD ELECTRODES

- A. Copper-clad steel, 5/8-inch (16 mm) minimum diameter, 10 feet (3,000 mm) long, coupling type unless otherwise noted.

## 2.11 GROUNDING WELL COMPONENTS

- A. Well Pipe: 8 inches NPS (DN200) by maximum 12 inches (300-mm) long, precast concrete or fiberglass pipe with belled end.
- B. Well Cover: Cast iron, high impact traffic rated cover with legend "GROUND" embossed on outer face.

## 2.12 ANCHORS AND FASTENERS

- A. Indoor Locations: Epoxy type anchors and heavy-duty, galvanized steel screws and bolts.
- B. Outdoor Locations: Epoxy type or Red Head anchor bolts and stainless steel screws and bolts.

## 2.13 SUPPORT CHANNEL

- A. All conduit and electrical equipment support channels for interior, exterior, wet and corrosive areas shall be galvanized steel.

- B. Support channels for free standing electrical equipment such as switchgear, switchboard antennas, and motor control centers, shall be:
  - 1. Indoors: galvanized steel channel and hardware, minimum 12 gauge, ASTM A653 Grade 33 sheet steel, zinc coated by hot dip process.
  - 2. Outdoors: 316 Stainless steel

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.

### 3.2 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods as specified.
- C. Install temporary wiring and connections to maintain existing grounding systems in service during construction.
- D. Perform work on energized equipment or circuits with experienced and trained personnel following all safety rules and procedures.
- E. Remove, relocate, and extend existing installations to accommodate new construction.
- F. Repair adjacent construction and finishes that are damaged during demolition and extension work.
- G. Remove exposed and/or abandoned grounding and bonding components, fasteners, supports and electrical identification labels. Cut embedded support elements below surface of walls and floors. Patch surfaces damaged by removal of existing components to match surrounding finishes.

### 3.3 GROUNDING AND BONDING INSTALLATION:

- A. Verify that final backfill and compaction has been completed before driving rod electrodes.
- B. Install grounding well with cover at rod locations as indicated. Install well top flush with finished grade.
- C. Installation:
  - 1. Remove paint, rust, mill-oils, and surface contaminants at connection points.
  - 2. Install grounding electrode conductor and connect to reinforcing steel in slab or foundation.
  - 3. Bond together metal siding not attached to grounded structure; bond to ground.
  - 4. Bond together reinforcing steel and metal accessories.
  - 5. Connect to site grounding system.

6. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, provide an artificial station ground by means of driven rods or buried electrodes.
7. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panel boards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
8. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel in accordance with IEEE 1100.
9. Accomplish grounding of electrical system by installing insulated grounding conductor with each feeder and branch circuit conductor in conduit. Install separate insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing. Size grounding conductor in accordance with the NEC.
10. Install grounding conductor from ground bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes, and metal enclosures of service equipment.
11. Bond all metallic conduits to grounding bus at service panel by means of grounding bushings using minimum No. 12 AWG conductor.
12. Ground electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC. Bond together each metallic raceway, pipe, duct and other metal object entering enclosures and exiting slabs.
13. Permanently bond all equipment, grounding conductors, lightning protection system and grounding system prior to energizing equipment.

### 3.4 GROUND CONDUCTORS

- A. Grounding conductors shall be located and connected as indicated or as required by Code.
- B. Ground conductors under buildings or structures shall be buried with at least 6 inches of earth cover. Buried grounding conductors extending beyond the foundations of buildings or structures shall have at least 18 inches of earth cover.
- C. Exposed conductors shall be installed inconspicuously in vertical or horizontal positions on supporting structures. When located on irregular supporting surfaces or equipment, the conductors shall run parallel to or normal to dominant surfaces.
- D. Conductors routed over concrete, steel, or equipment surfaces shall be kept in close contact with those surfaces by using fasteners located at intervals not to exceed 3 feet.
- E. Conductors passing through floor slabs shall be installed in conduit sleeves that extend above the floor slab, a minimum of 1-1/2 inches to provide protection. Sleeves shall be sealed to maintain fireproof integrity.
- F. Provide isolated grounding conductor for circuits supplying equipment and systems as indicated.

- G. Provide a separate equipment-grounding conductor for low voltage distribution systems, single or three phase feeder circuit and each branch circuit with single or three phase protective devices. Install a grounding conductor in conduit with phase and neutral conductors. Single-phase branch circuits for 120 and 277 volt lighting, receptacles, and motors shall have a phase, neutral, and ground conductors installed in the common conduit. Provide suitable bonding jumpers and approved grounding type bushings for flexible conduits used for equipment connection utilized in conjunction with the above branch circuits. Single-phase circuits for equipment and all branch circuits installed in non-metallic or flexible conduits shall be provided with a separate grounding conductor.
- H. Ground the neutral of separately derived systems with a bare copper conductor, installed in conduit, from the neutral directly to the building interior cold water pipe or nearest solidly grounded structural reinforcing steel, in accordance with the provisions of NEC Article 250-24. Use bolted accessible connections to the ground system so that the neutral ground can be disconnected for test. Ground the system ground conduit as detailed on drawing. Size the grounding electrode conductors in accordance with the NEC, Table 250-66, or as indicated.

### 3.5 CONNECTIONS

- A. All connections shall be made by the exothermic welding process, except where otherwise indicated. The manufacturer's instructions on the use of exothermic welding materials shall be followed in all details. Powder and molds shall be kept dry and warm until use. Worn or damaged molds shall not be used.
- B. All surfaces to be joined by the welds shall be thoroughly cleaned. Paint, scale, and other deleterious substances shall be removed from surfaces of ungalvanized structural steel members by grinding. Galvanized steel surfaces shall be cleaned with emery paper.
- C. All exothermic welded connections shall successfully resist moderate hammer blows. Any connection which fails such test or which, upon inspection, indicates a porous or deformed weld, shall be remade.
- D. All exothermic welds shall encompass 100 percent of the ends of the materials being welded. Welds, which do not meet this requirement, shall be remade.
- E. Worn, damaged, incorrectly sized, or improperly shaped molds which, in the opinion of the Owner and/or Engineer, do not make satisfactory welds, shall be removed from the jobsite after being physically rendered inoperable.
- F. All contact surfaces of bolted and screwed connections shall be thoroughly cleaned and coated with oxide inhibitor before being securely tightened.

### 3.6 CONDUIT GROUNDING

- A. All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with a bare copper conductor. Grounding bushings shall be grounded with conductors sized in accordance with NEC, but not smaller than No. 8 AWG.

### 3.7 EQUIPMENT GROUNDING

- A. Comply with NEC 250, except where larger sizes or more conductors are indicated.
  - 1. All electrical equipment shall be connected to the grounding system with an insulated, green, stranded or solid copper equipment-grounding conductor.
  - 2. Terminate each end on suitable lug, bus, or bushing. The term "electrical equipment", as used in this article, shall include, but not be limited to, all enclosures containing electrical connections or bare conductors, except that individual devices, such as solenoids, pressure switches, and limit switches, shall be exempt from this requirement, unless the device requires grounding for proper operation.
  - 3. Large equipment, such as metal-clad or metal-enclosed switchgear, will be furnished with a grounding bus that shall be connected to the grounding system.
  - 4. Most other equipment will be furnished with grounding pads and/or grounding lugs which shall be connected to the grounding system. All ground connection surfaces shall be cleaned immediately prior to connection.
  - 5. Contractor shall furnish all grounding material required, if not furnished with the equipment.
- B. Install equipment grounding system such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits will operate continuously at ground potential and provide a low impedance path for possible ground fault currents.
- C. Where grounding system extension stingers are indicated to be provided for connection to electrical equipment, the Contractor shall connect the bare grounding conductor to the equipment ground bus, pad, or lug. Except where otherwise indicated, all equipment ground conductors that are not an integral part of a cable assembly, shall be sized in accordance with the requirements of NEC. All ground conductors installed in conduit shall be insulated.
- D. Suitable grounding facilities, acceptable to the Owner, shall be furnished on electrical equipment not so equipped. The grounding facilities shall consist of compression type terminal connectors bolted to the equipment frame or enclosure and providing a minimum of joint resistance.
- E. The conduit system is not considered to be a grounding conductor, except for lighting fixtures. No grounding conductor shall be smaller in size than No. 12 AWG, unless it is a part of an acceptable cable assembly.

### 3.8 ANCHORS, FASTENERS AND SUPPORT

- A. Installation:
  - 1. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
  - 2. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
  - 3. Do not use spring steel clips and clamps.
  - 4. Do not use powder-actuated anchors.
  - 5. Do not drill or cut structural members.

- B. Supports:
1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
  2. Install surface-mounted cabinets and panel board with minimum of four (4) anchors.
  3. Use steel channel supports to stand cabinets and panel boards one (1) inch off wall.
  4. Use sheet metal channel to bridge studs above and below cabinets and panel boards recessed in hollow partitions.

### 3.9 ACCEPTANCE TESTING

- A. Grounding and Bonding: Perform inspections and tests as outlined below (NETA ATS, Section 7.13 – Grounding Systems).
1. Visual and Mechanical Inspection
    - a. Verify ground system is in compliance with drawings and specifications.
  2. Electrical Tests
    - a. Perform fall-of-potential test or alternative in accordance with IEEE Standard 81 “IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potential of a Ground System.” on the main grounding electrode or system. Instrumentation utilized shall be as defined in Section 12 of the above guide and shall be specifically designed for ground impedance testing. Provide sufficient spacing so that the plotted curves flatten in the 62% area of the distance between the item under test and the current electrode.
    - b. Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and/or derived neutral points.
    - c. When sufficient spacing of electrodes per Electrical Tests is impractical, perform ground impedance measurements utilizing either the intersecting curves method or the slope method. (Ref. Nos. 40 and 41 in IEEE Std. 81).
    - d. Utilize two-point method of IEEE Std. 81. Measure between equipment ground being tested and known low-impedance grounding electrode or system.
    - e. Test shall be performed after a minimum of ten (10) calendar days of dry weather so that the ground is not wet.
  3. Test Values
    - a. Ground resistance of the system shall be no greater than five (25) ohms.
    - b. Investigate point-to-point resistance values which exceed 0.5 ohm.

END OF SECTION

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SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes conduit and tubing, surface and buried raceways, wireways, outlet boxes, pull boxes, junction boxes, hand holes and concrete manholes.

1.2 REFERENCES - CODES AND STANDARDS

- A. ANSI C80.1 Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 Electrical Metallic Tubing, Zinc Coated.
- C. ANSI C80.6 American National Standard for Electrical Intermediate Metal Conduit.
- D. ASTM A 48 Standard Specification for Grey Iron Castings.
- E. NECA (National Electrical Contractor's Association) – "Standard of Installation."
- F. NEMA FB 1 (National Electrical Manufacturers Association) – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- G. NEMA OS 1 (National Electrical Manufacturers Association) – Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- H. NEMA OS 2 (National Electrical Manufacturers Association) – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- I. NEMA RN 1 (National Electrical Manufacturers Association) – Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- J. NEMA TC 2 – Electrical Polyvinyl Chloride (PVC) Conduit.
- K. NEMA TC 3 (National Electrical Manufacturers Association) – PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- L. NEMA TC 6 - Non-Metallic Conduit.
- M. NEMA 250 (National Electrical Manufacturers Association) – Enclosures for Electrical Equipment (1,000 Volts Maximum).
- N. NFPA 70 National Electrical Code (NEC). Latest approved edition
- O. UL 1 Flexible Metal Conduit

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- P. UL 6 Rigid Metal Conduit
- Q. UL 514B Conduit, Tubing and Cable Fittings.
- R. UL 651 Rigid Non-Metallic Conduit
- S. UL 797 Electrical Metallic Tubing
- T. UL 1242 Intermediate Metal Conduit

1.3 Conduit application

A. Acceptable raceway systems and their limitations of use are summarized in the following table:

Location	RSC	RNC	EMT	FMC	LFMC
Exterior locations: Wet or subject to physical damage.	Yes	No	No	No	No (note 4)
Exterior locations: Damp and not subject to physical damage.	Yes	No	No	No	Yes
Interior locations: Wet or subject to physical damage.	Yes	No	No	No	No (note 4)
Interior locations: Exposed and not subject to physical damage.	Yes	No	Yes	Yes (note 5)	Yes
Interior locations: Totally concealed.	Yes	No (note 4)	Yes	Yes (note 5)	Yes
Underground:	Yes	Yes (Note 6)	No	No	No

B. Notes for Conduit Application Table:

1. RSC = rigid steel conduit, RNC = rigid nonmetallic conduit, EMT = electrical metallic tubing, FMC = flexible metal conduit, LFMC = liquidtight flexible metal conduit.
2. For the purposes of these specifications, locations subject to physical damage include, but are not limited to, those areas less than 6 feet above the finished floor or grade.

3. Rigid nonmetallic conduit may also be used above grade, where totally concealed in walls, for transitions from underground up to a height of 24 inches above the concrete sill.
4. The use of flexible metal conduit is limited to lengths not exceeding 6 feet for flexible connections to equipment and lighting fixtures, or where necessitated by structural obstacles and explicitly approved by the Engineer.
5. The use of RNC underground is acceptable for horizontal runs and bends not exceeding 45 degrees. For bends over 45 degrees and for 90-degree conduit stub ups, provide RSC with tape wrappings.

1.4 BOX APPLICATION

- A. Provide raceway, boxes and manholes located as indicated and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements and for a complete wiring system.

1.5 conduit size

- A. Minimum acceptable conduit sizes are summarized in the following table:

	Minimum Size
Underground <ul style="list-style-type: none"> <li>• Building wiring</li> <li>• Site Wiring</li> </ul>	2"
Aboveground <ul style="list-style-type: none"> <li>• Equipment or panel feeders</li> <li>• Telecommunications</li> </ul>	3/4"
Aboveground <ul style="list-style-type: none"> <li>• Lighting or branch circuit wiring</li> <li>• Fire alarm</li> <li>• Security</li> </ul>	1/2"
Other	3/4"

1.6 SUBMITTALS

- A. Detailed conduit routing plan as follows:

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1. Exposed and/or concealed in building walls for conduits larger than 2-inch outside diameter.
2. All underground conduits (3/4-inch and larger) in duct bank; concealed in floor slabs, equipment pads and concrete slabs.

#### B. Product Data:

1. Rigid Steel Conduit.
2. Intermediate steel conduit.
3. Electrical Metallic Tubing (EMT).
4. Flexible metal conduit.
5. Liquid tight flexible metal conduit.
6. Nonmetallic conduit.
7. Raceway fittings.
8. Conduit bodies.
9. Surface raceway.
10. Pull boxes, junction boxes and manholes.

#### C. Manufacturer's Installation Instructions:

1. Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.
2. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

## 1.7 CLOSEOUT SUBMITTALS

#### A. Project Record Documents:

1. Record actual routing of conduits.
2. Record actual locations and mounting heights of outlet, pull boxes, junction boxes and manholes.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

## PART 2 PRODUCTS

### 2.1 CONDUIT

- A. Galvanized Rigid Steel Conduit (GRSC or RGS), couplings and elbows shall be hot-dip galvanized, rigid mild steel in accordance with ANSI C80.1 and UL 6. The conduit interior and exterior surfaces shall have a continuous zinc coating with a transparent overcoat of enamel, lacquer, or zinc chromate. Conduit shall be formed with continuous welded seams with a uniform wall thickness, in minimum 10-foot lengths, with threaded ends.

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- B. Intermediate Metal Conduit (IMC). Raceway shall be hot-dip galvanized mild steel in accordance with ANSI C80.6 and UL 1242 and shall bear the UL label. Conduit shall have same characteristics of rigid steel except for thinner wall.
- C. Electrical Metallic Tubing (EMT). Electrical metallic tubing, including elbows and bends, shall be zinc coated, mild steel in accordance with the requirements of ANSI C80.3 and UL 797. The interior and exterior surfaces of the tubing shall have a continuous zinc coating. Conduit shall be formed with a continuous welded seam, with a uniform wall thickness, in minimum 10-foot lengths.
- D. Flexible Metal Conduit shall be galvanized steel meeting the requirements of UL 1. Flexible aluminum conduit is not permitted.
- E. Liquid-Tight Flexible Metal Conduit shall be plastic-jacketed, galvanized steel, "Sealtite" Type EF for general service areas or Type HC for high-temperature when used under raised floor or in air plenums. Conduit shall be UL listed.
- F. Non-Metallic Conduit shall be as follows:
  - 1. Schedule 40: Conduit shall be 90 degree Celsius, polyvinyl chloride in conformance with NEMA TC-2 and UL 651 requirements.
  - 2. Spacers used in duct bank installations shall be high impact plastic, interlocking bases, and intermediate type spacers. Place spacers between 6 and 10 feet apart.
- G. Rigid aluminum, flexible aluminum, or flexible non-metallic conduits shall not be used on this project.

## 2.2 RACEWAY FITTINGS

- A. Couplings and Thread Protectors. Each length of threaded conduit shall be provided complete from the manufacturer with a coupling on one end and a thread protector on the other. The thread protector shall have sufficient mechanical strength to protect the threads during normal handling and storage.
- B. Metal Conduit Fittings shall conform to the requirements of UL 514B where this standard applies. Galvanized iron or galvanized steel fittings shall be used with steel conduit. Threaded fittings shall engage a minimum of five threads made up wrench-tight and be compatible with conduit. EMT fittings shall be compression type, UL approved for rain tight applications and setscrew type with insulated throat for indoor applications.
- C. Liquid-Tight Flexible Conduit Fittings shall be galvanized steel, T&B 53XX series insulated throat, and shall bear the UL label. Die-cast malleable fittings are not acceptable.
- D. Liquid-Tight Flexible Metal Conduit Fittings shall be galvanized steel similar to T&B "Tite-Bite".
- E. Non-Metallic Conduit Fittings shall be of same material and strength characteristics as the conduit and shall be solvent welded as recommended by manufacturer. End bells shall be plastic, high impact, tapered to fit. Where conduit transition from non-

metallic to metallic is required, provide non-metallic female “terminal” adapter. Non-metallic “male” adapters are not acceptable.

- F. Special Fittings. Conduit sealing, explosion proof, dust proof, and other types of special fittings shall be provided as required and shall be consistent with the area and equipment with which they are associated. Fittings installed outdoors or in damp locations shall be sealed and gasketed. Outdoor fittings shall be of heavy cast construction. Hazardous area fittings and conduit sealing shall conform to NEC requirements for the area classification.
- G. Bushings shall be provided for the termination of all conduits not terminated in hubs, couplings or insulated throat connectors. Grounding type insulated bushings with insulating inserts in metal housings shall be provided for conduit 1-1/4 inches and larger. Standard bushings shall be galvanized steel or malleable iron in all sizes.
- H. Locknuts. One interior and one exterior locknut shall be provided for all conduit terminations not provided with threaded hubs and couplings. Locknuts shall be designed to securely bond with the conduit to the box when tightened. Locknuts shall be so constructed that they will not be loosened by vibration.
- I. Unions. Watertight conduit unions shall be Appleton or Crouse-Hinds Type UNF or UNY, or approved equal.
- J. Raintight Conduit terminating hubs, where indicated on the drawings or required by these specifications, shall be Meyer’s rigid conduit hubs, or approved equal.

## 2.3 CONDUIT BODIES

- A. Malleable iron conduit bodies shall be cast malleable iron with tensile strength meeting ASTM A 48, Class 30A requirements. Malleable conduit bodies shall be finished with an epoxy powder coating. Cover shall be malleable iron with captive screws.
- B. All conduit bodies’ entrances shall be machined NPT threads with a smooth, rounded, internal conduit stop bushing.
- C. All conduit bodies shall be equipped with a sealed and gasketed cover. Cover shall be secured using stainless steel machine screws.

## 2.4 CONDUIT SUPPORTS

- A. Conduit supports shall be furnished and installed in accordance with other section of these specifications. Conduits shall be supported so that fittings are accessible. Support systems shall be limited to electrical conduits only.
- B. Hanger rods shall be 3/8-inch diameter galvanized threaded steel rods, minimum. Conduit racks over 18-inch wide, over one level, or supporting 2-inch RSC or larger, shall be 1/2-inch diameter rod minimum.

- C. Conduit Clamps. Conduits in single runs or groups of two shall be supported by steel clamps and clamp backs. They shall be galvanized malleable iron or approved equal cast ferrous metal for steel conduit or tubing.
- D. Support Channels. Supports for banks of three or more conduits shall be constructed of formed steel support channels (Unistrut, Kindorf, Superstrut, B-Line or approved equal) with associated conduit or tubing clips. Support channels shall be steel, hot-dip galvanized after fabrication with galvanized steel clips for steel conduit or tubing.

## 2.5 OUTLET BOXES AND SWITCH BOXES

- A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized flat rolled sheet steel outlet wiring boxes of types, shapes and sizes, including box depths, to suit each respective location and installation; construct with stamped knockouts in back and sides, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.
- B. Outlet boxes used in wet outdoor locations, surface mounted shall be cast metal (FS or FD type) with mounting lugs and gasketed covers.
- C. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported, per NEC requirements.
- D. Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and meeting requirements of individual wiring situations.

## 2.6 PULL BOXES, JUNCTION BOXES

- A. Sheet Metal Boxes shall be NEMA OS 1, NEMA rating as indicated. Minimum 16 gauge galvanized steel construction with stainless steel hinged cover and neoprene gasket. Cover shall be secured to the body with a continuous, full length, piano type hinge and stainless steel pin on one side and captive screw on the other side. Door shall be equipped with padlock hasp with sealing hole provisions.
  - 1. Provide #10-32 tapped hole provisions for optional ground lug kit.
  - 2. Provide 0.375-16 collar studs for mounting optional panel.
  - 3. Provide external mounting feet for secure wall mounting.
  - 4. Finish: Wash and phosphate undercoat with ANSI 61 gray polyester power finish.
- B. Surface-Mounted Cast Metal Box: NEMA 250, NEMA Type 3R or 4X as indicated, flat-flanged, surface-mounted junction box:
  - 1. Material: Cast Iron.
  - 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

## 2.7 CLOSURE FOAM

- A. All conduit, raceways, cables and sleeves penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed by closure foam

as in Dow Corning #3-6548 silicone RTV, GE RTV 850 silicone foam, or approved equal.

## 2.8 SEALING AND FIREPROOFING

- A. Penetrations. All conduits, raceways, cables and sleeve penetrations through fire rated and hazardous location walls, shafts, floor, ceilings, etc., shall be sealed with a UL-approved fire stopping system.
- B. Furnish UL listed products or products tested by a nationally recognized independent testing laboratory. Select products with rating not less than the rating of the wall, ceiling or floor being penetrated.
- C. Manufacturers:
  - 1. 3M CP 25WB + Caulk
  - 2. 3M FS 195 wrap or strip with restricting collar
  - 3. 3M CS 195 composite sheets
  - 4. Proset Systems fire rated floor and wall penetrations
  - 5. Dow Corning Fire Stop System
  - 6. Substitutions not permitted.
- D. Use stamped steel, chrome plated, hinged, split ring escutcheons or floor/ceiling plates for covering openings in occupied areas where conduit is exposed.
- E. In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the conduit and the cored opening or a water-stop type wall sleeve.
- F. At non-rated interior wall or floor openings use Tremco Fyre-Sil, Sika Corp. Sikaflex la, Sonneborn Sonolastic NPT, or Mameco Vulkem 116 urethane caulk or approved equal.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough in.

### 3.2 EXISTING WORK

- A. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.
- B. Clean and repair existing raceway and boxes to remain or to be reinstalled.

### 3.3 INSTALLATION OF RACEWAYS

- A. Routing
  - 1. Install raceway and boxes in accordance with NECA "Standard of Installation."

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2. Conduit routing is diagrammatic only. Contractor shall field route conduit and raceways between equipment and devices as required to obtain a complete wiring system.
  3. All exposed conduits shall be installed parallel or perpendicular to dominant surfaces with right-angle turns made of symmetrical bends or fittings.
  4. Conduit shall not be installed on the outside face of exposed columns, but shall be routed on the web or on the inside of a flange of the column.
  5. Except where prevented by the location of other work, a single conduit or a conduit group shall be centered on structural members.
  6. Conduit shall be located at least 6 inches from hot water or steam pipes and from other hot surfaces
- B. Moisture Pockets
1. Moisture pockets shall be eliminated from conduits. If water cannot drain to the natural opening in the conduit system, a hole shall be drilled in the bottom of a pull box or a "C-type" conduit fitting provided in the low point of the conduit run.
- C. Couplings and Unions
1. Metal conduit shall be joined by threaded conduit couplings, with the conduit ends butted.
  2. The use of running threads, Erickson type couplings, split couplings or similar unions are not permitted.
- D. Conduit Bodies
1. Conduit bends shall meet the requirements of NEC, minimum bend radius of the cable installed or as indicated, whichever is greater.
  2. Conduits or tubing deformed or crushed in any way shall be removed from the site.
- E. Bends and Offsets
1. Changes in direction of conduits shall be made with fittings or bends.
  2. Conduit bends shall meet the requirements of NEC, minimum bend radius of the cable installed or as indicated, whichever is greater.
  3. Bends shall be made using appropriate tools or mechanical equipment. The use of a pipe tee or vise for bending conduit or tubing will not be permitted.
  4. For non-metallic conduit or plastic coated steel, approved factory bends and offsets shall be used.
  5. Conduits or tubing deformed or crushed in any way shall be removed from the site.
  6. Install no more than the equivalent of three 90 degree bends between boxes or outlets
- F. Cutting and Threading
1. The plane of all conduit ends shall be square with the centerline.
  2. Where threads are required, they shall be cut and cleaned prior to conduit reaming.
  3. The ends of all conduit and tubing shall be reamed to remove all rough edges and burrs.
  4. Cutting oil shall be used in threading operations; the dies shall be kept sharp, and provisions shall be made for chip clearance.

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5. Threads on conduits and fittings shall be lubricated with conducting and sealing compound.
  6. All steel conduits shall be coated after threading with cold-galvanized zinc coating. The Contractor shall furnish this protective material and shall apply it in the field prior to installing conduit or fittings.
- G. All steel conduit, exposed to weather or in contact with earth, shall be re-galvanized after threading with "Galvanizing Powder M-321" as manufactured by the American Solder and Flux Company of Philadelphia, Pennsylvania; "Zincilate 810" as manufactured by Industrial Metal Protectives, Inc., of Dayton, Ohio; "Zinc Rich" coating as manufactured by ZRC Chemical Products Company, Quincy, Massachusetts; or approved equal. The Contractor shall furnish this protective material and shall apply it in the field.
- H. Connections to Boxes and Cabinets
1. Conduit shall be securely fastened to all boxes and cabinets.
  2. Threads on metallic conduit shall project through the wall of the box to allow the bushing to butt against the end of the conduit.
  3. The locknuts, both inside and outside, shall then be tightened sufficiently to bond the conduit securely to the box.
  4. Locknuts on connectors shall be tightened securely to bond the connectors.
- I. All conduits entering enclosures outdoors or in wet areas shall enter through Meyer's hubs, or approved equal, or threaded openings.
- J. Cleaning
1. Precautions shall be taken to prevent the accumulation of water, dirt, or concrete in the conduit.
  2. Conduit in which water or other foreign materials have been permitted to accumulate shall be thoroughly cleaned or, where such accumulation cannot be removed by methods acceptable to the Owner /Engineer, the conduit shall be replaced.
  3. For conduits sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of foreign materials. For conduits less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles and foreign material.
- K. Empty Conduit
1. All conduits installed for future use shall have a polypropylene pull line with a minimum tensile strength of 200 lbs., Jet Line, Cat. No. 232, polyolefin, or approved equal. Pull line shall be secured at both ends to ensure future accessibility.
- L. Rooftop Conduits
1. Provide redwood sleepers on waterproof mastic base for all conduit runs exposed on roofs.
- M. Identification

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1. All conduits shall be identified in accordance with other section of these specifications.
- N. Grounding
1. All conduits shall be grounded in accordance with specification Section 16060 – Grounding and Bonding for Electrical Systems.
  2. A solid or stranded bare copper or green insulated copper solid or stranded ground wire shall be provided in all conduits and raceways.
- O. Galvanized Rigid Steel Conduit
- P. Polyvinyl Chloride (PVC) Coated Galvanized Rigid Steel Conduits
1. PVC -coated, steel conduit and fittings shall be installed where shown on the Contract Drawings where embedded or pass through concrete or where highly corrosive conditions exist, indoors or outdoors.
  2. The Contractor shall patch any damaged coating according to the manufacturer's instructions.
- Q. Galvanized Rigid Steel Conduit
1. Galvanized rigid steel conduit shall be installed in areas exposed to weather, vehicle traffic, in hazardous classified areas, for penetrations through foundations, and 10 feet before transition from below grade to 8 feet above grade, unless otherwise indicated.
  2. Steel conduit in contact with earth shall be protected by "Scotchwrap" 10 mil tape applied in double thickness using 50 percent lap turns to 6 inches above grade and 6 inches beyond transition.
  3. Expansion joints shall be used where required.
- R. Intermediate Steel Conduit
1. Intermediate steel conduit may be installed in lieu of galvanized rigid steel conduit in all above ground areas where rigid steel conduit is permitted, except for wires over 600- volts, unless otherwise specified.
- S. Electrical Metallic Tubing
1. Electrical metallic tubing shall be installed for all circuits, indoors above concrete slab, where not subject to conditions outlined for rigid galvanized steel conduits.
- T. Rigid Aluminum Conduit
1. Not acceptable.
- U. Flexible Metal Conduit, Steel
1. Flexible conduit inserts not greater than 30 inches in length, shall be installed in all conduit runs, which are supported by both building steel and by structures subject to vibration or thermal expansion. This shall include locations where conduit supported by building steel enters or becomes supported by isolated structures on separate foundations.
  2. Flexible conduit shall be installed in conduit runs, which cross expansion joints.
  3. Special areas, such as plant office control rooms in which external noise is to be minimized, shall have flexible conduit in conduit runs where the runs cross from the main building framing to the control room or office framing.

4. Flexible conduit shall be installed adjacent to all equipment and devices, which move in relation to the supply conduit due to vibration, normal operation of the mechanism, or thermal expansion.
5. Conduit shall be connected to pressure switches, thermocouples, solenoids, and similar devices with flexible conduit. Flexible conduit shall be installed adjacent to the motor terminal housing for motors requiring 4-inch and smaller conduit.
6. Flexible metal conduit inserts not greater than 6 feet in length shall be installed for light fixture tap conductors.

V. Liquid-Tight Flexible Metal Conduit

1. Liquid-tight flexible metal conduit shall be used in place of regular flexible conduit for connections to motors and transformers, in areas exposed to weather, moisture or oil, and under raised floors.
2. Liquid-tight flexible metal conduit may be used in place of flexible metal conduit where not otherwise required.

W. Non-Metallic Conduit

1. Schedule 80 shall be used for all power, signal feeders and branch circuits, in earth under roadways. Conduits must be buried in earth in accordance with the NEC.
2. Schedule 40 shall be used for all other power, signal feeders and branch circuits, in earth or enclosed in concrete, unless otherwise noted on the drawings. Conduits must be buried in earth in accordance with the NEC.

X. Conduit Support

1. Fasten conduit supports to building structures and surfaces in accordance with these specifications.
2. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
3. Do not use wire, ceiling support wires or perforated pipe straps to support conduit. Remove any temporary installation support wire.

Y. Spacing of Supports

1. All conduit runs shall be rigidly supported, except where buried in concrete,.
2. Each conduit shall be supported within one (1) foot of junction boxes and fittings.
3. Spacers used in duct bank installations shall be placed no more than 6 to 10 feet apart.
4. Support spacing along conduit runs shall be as follows.

Conduit Size	Maximum Distance Between Supports
½ inch through 1-1/4 inch	5 feet
1-1/2 inch and larger	8 feet

Z. Ground and bond raceway and boxes in accordance with Section 16060 – Grounding and Bonding for Electrical Systems.

### 3.4 CABINET AND BOX INSTALLATION

- A. Install electrical boxes as indicated, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Locate boxes and conduit bodies so as to ensure ready accessibility of electrical wiring, maintain headroom and to present neat mechanical appearance.
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. In inaccessible ceiling areas, install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices with each other.
- E. Use flush mounting outlet boxes in finished areas.
  - 1. Do not install flush mounting boxes back-to-back in walls.
  - 2. Provide minimum 6-inch separation between adjacent boxes.
  - 3. Provide minimum 24-inch separation in acoustic rated walls.
  - 4. Use stamped steel bridges to fasten flush mounting outlet box between studs.
  - 5. Secure flush mounting box to interior wall and partition studs.
  - 6. Accurately position to allow for surface finish thickness.
  - 7. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
  - 8. Use adjustable steel channel fasteners for hung ceiling outlet box.
- F. Support boxes independently of conduits.
- G. Use code sized gang box where more than one device is mounted together. Do not use sectional box. Use code sized gang box with plaster ring for single device outlets.
- H. Use cast outlet box in exterior locations where exposed to the weather and wet locations (interior or exterior).
- I. Coordinate installation of electrical boxes and fittings with cable and raceway installation work. Provide knockout closures to cap unused knockout holes where blanks have been removed.
- J. Avoid using round boxes where conduit must enter box through side of box, which would result in difficult and insecure connections where fastened with a locknut or bushing on rounded surface.
- K. Fasten boxes rigidly to substrate or structural surfaces to which they are being mounted, or solidly embed electrical boxes in concrete or masonry as appropriate.
- L. Except as prevented by the location of other work, all junction boxes and outlet boxes shall be centered on structures.
- M. Conduit openings in boxes shall be made with a hole saw or shall be punched.
- N. Cabinets and boxes shall be rigidly mounted.

1. Mounting on concrete shall be secured by self-drilling anchors.
  2. Mounting on steel shall be by drilled and tapped screw holes, or by special support channels welded to the steel, or by both.
  3. Cabinets shall be leveled and fastened to the mounting surface with not less than ¼-inch air space between the enclosure and mounting surface.
  4. All mounting holes in the enclosure shall be used.
- O. Large Pull Boxes - Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.
1. Interior Dry Locations - Use hinged enclosure.
  2. Other Locations - Use surface mounted box of appropriate location classification.

### 3.5 ANCHORS

- A. Where supports for raceways, boxes, and cabinets are mounted on concrete surfaces, they shall be fastened with self-drilling tubular expansion shell anchors with externally split expansion shells, single-cone expanders, and annular break-off grooved chucking cones. Anchors shall be Phillips "Red Head" or approved equal.

### 3.6 SEALING AND FIREPROOFING

A. Fire-Rated Surface:

1. Where conduit penetrates fire rated surface, install fire-stopping product in accordance with manufacturer's published instructions.
2. All openings through fire rated wall, floor, ceiling or roof must be sealed.
3. Install galvanized sheet metal sleeves (minimum 12-gage) through opening and extending beyond minimum of one (1) inch on each side of building element.
4. Pack void between sleeve and building element with backing material.
5. Seal ends of sleeve with UL listed fire-resistive silicone compound to meet fire rating of structure penetrated.

B. Non-Rated Surfaces:

1. Opening through a non-fire rated wall, floor, ceiling or roof must be sealed using an approved type of material.
2. Use galvanized sheet metal sleeves in hollow wall penetrations to provide a backing for the sealant. Grout area around sleeve in masonry construction.
3. Install escutcheons or floor/ceiling plates where raceway, penetrates non-fire rated surfaces in occupied spaces.
4. Install rubber links of mechanical seal tightened in place and sized for the pipe, in exterior wall openings below grade, in accordance with the manufacturer's instructions.
5. All pipe penetrations at interior partitions and/or walls, laboratory spaces, telephone, data and communication rooms and similar spaces where the room pressure or odor transmission must be controlled, shall be sealed. Sealant shall be applied to both sides of the penetration in such a manner that the annular space between the pipe sleeve and the pipe is completely filled.

### 3.7 ADJUSTING

- A. Install knockout closures in unused openings in boxes.

3.8 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore manufacturer's finish.

END OF SECTION

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## SECTION 26 05 53

### IDENTIFICATION FOR ELECTRICAL SYSTEMS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. The extent of the electrical systems and equipment requiring identification is indicated, and the extent of identification required is specified herein and in individual sections of work requiring identification. The types of electrical identification specified in this section include the following:
  - 1. Exposed conduit color banding.
  - 2. Buried cable warnings.
  - 3. Cable/conductor identification.
  - 4. Operational instructions and warnings.
  - 5. Danger signs.
  - 6. Equipment/system identification signs.

##### 1.2 REFERENCES - CODES AND STANDARDS

- A. ANSI Z535.1 - Safety Color Code
- B. APWA ULCC - Uniform Color Code for Buried Utilities.
- C. NFPA 70 National Electrical Code (NEC). Latest approved edition.

##### 1.3 SYSTEM DESCRIPTION

- A. Label the following electrical equipment with nameplates which clearly identify each item, the function or use of the item, and the circuit identification of the feed to the item:
  - 1. All Metal-Clad Switchgear, Metal-Enclosed Switchgear, Switchboards, Distribution Panelboards, Power and Lighting Panels, Motor Control Centers, Local Control Panels, Terminal Cabinets and all electrical equipment enclosure shall be identified using laminated plastic nameplates. Show the equipment number, voltage rating, current rating, number of phases, connection type, short circuit interrupting rating, and circuit number
  - 2. Identify all receptacles and lighting switches, by the circuit number indicated using ¼-inch high white characters on ½-inch wide black stick-on tape placed on the wall directly above the device if the device is wall mounted. Place the tape on the device enclosure if the device is not wall mounted.
  - 3. All motors, starters, disconnect switches, Time Switches, Special Function Pushbuttons and Switches, and miscellaneous control devices shall be identified by function and circuit number, with ¼-inch high white characters on a ½-inch wide black stick-on tape where installed indoors and engraved plastic nameplates where installed outdoors.
  - 4. All underground raceway or cable shall be marked with buried warning tape along its entire length.
  - 5. All exposed raceway longer than 10 feet in length shall be identified.

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6. Panelboard Directories: Furnish all panelboards with a complete 8-1/2-inch by 11-inch typewritten directory mounted in the inner door under a clear plastic cover set in a metal frame.
- B. Branch circuits and devices:
1. Label all individual receptacle outlets at the outlet faceplate to indicate the panelboard of origin and branch circuit number. Label modular furniture feeds at the power pole drop in a visible and consistent location. Labels shall be self adhesive, thermal machine printed type such as Brothers, Panduit, T&B, or approved equal and shall be clear plastic with black lettering.
  2. All branch circuits in outlet boxes shall be identified with circuit number using wrap-around labels (T&B, BRADY, 3M, or approved equal).
  3. As an alternative to separate nameplates, device plates may be engraved directly with lettering filled with black enamel.

**1.4 SUBMITTALS**

- A. Catalog data for nameplates, labels, and markers.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

**1.5 REGULATORY REQUIREMENTS**

- A. Conform to requirements of NFPA 70 – National Electrical Code.
- B. Furnish products listed and classified by Underwriters' Laboratories, Inc. (UL), Electrical Testing Laboratories, Inc. (ETL), or other recognized, approved testing and listing agencies as suitable for the purpose specified and shown.

**PART 2 PRODUCTS**

**2.1 NAMEPLATES AND LABELS**

- A. Nameplates
1. Engraved three-layer laminated plastic, white letters on black background for normal power and white letters on red background for emergency power. Communications and control cabinets shall be labeled with white letters on green background.
  2. Locations
    - a. Each electrical distribution and control equipment enclosure.
    - b. Communication cabinets.
    - c. Motor control centers, including each combination module.
  3. Letter Size
    - a. Use 1/8-inch letters for identifying individual equipment and loads.
    - b. Use 1/4-inch letters for identifying grouped equipment, loads, panelboards, and transfer switch.

- c. Use ½-inch letters for identifying the main switchboard, motor control centers, and large distribution switchboards.
- B. Labels
- 1. Embossed adhesive tape, with 3/16-inch white letters on colored background to match color scheme of plastic laminate labels in 2.1.A. Use only for identification of individual wall switches and receptacles, control device stations, and multi-outlet devices.
  - 2. Thickness
    - a. 1/16-inch for units up to 20 square inches or 8-inch length; 1/8-inch for larger units.

## 2.2 WIRE MARKERS

- A. Manufacturers
- 1. Brady
  - 2. Thomas & Betts
  - 3. 3-M Co.
  - 4. Approved Equal
- B. Description: Tape, split sleeve, or tubing type wire markers, self-adhesive.
- C. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, control panels, motor controllers and starters, and each load connection.
- D. Legend
- 1. Power and Lighting Circuits: Branch circuit or feeder number indicated.
  - 2. Control Circuits: Control wire number indicated on shop drawings.
  - 3. Neutral Conductors: Clearly indicate the branch circuit or feeder number the neutral serves. In multi-wire circuits where the neutral is shared, mark the neutral with the circuit number of the "A" phase.

## 2.3 CONDUIT MARKERS

- A. Provide manufacturer's standard preprinted, flexible or semi-rigid, permanent, plastic-sheet conduit markers, minimum of 3 mils thick and 1-1/2-inch wide extending 360 degrees around conduits; designed for self-adhesive attachment to conduit. Except as otherwise indicated, provide lettering that indicates the voltage of the conductor(s) in the conduit. Provide 8-inch minimum length for 2-inch and smaller conduit, 12-inch minimum length for larger conduit.
- B. Identify conduits containing conductors above 600-volts with the following alternating markers
- 1. DANGER - HIGH VOLTAGE
  - 2. The voltage, as applicable (i.e. – 12-kV, 4.16-kV, etc.)
- C. Identify conduits containing conductors below 600-volts with the following markers
- 1. The voltage, as applicable (i.e. 480-Volts, 240-Volts, etc.)
- D. Location: Furnish markers for each conduit longer than 10 feet.

- E. Spacing: 20 feet on center.
- F. Color: Unless otherwise indicated or required by governing regulation, provide conduit tags in the following colors.
  - 1. Normal and Emergency Power Systems: Orange w/black letters.
  - 2. Fire Alarm System: Red w/black letters.
  - 3. Telephone System: Green w/yellow letters.
  - 4. Data/Communication. System: White w/black letters.

## 2.4 FASTENERS

- A. Secure all labels and nameplates with self-tapping stainless steel screws. Use contact type permanent adhesive where screws cannot or should not penetrate the substrate.

## 2.5 BAKED ENAMEL DANGER SIGNS

- A. Provide manufacturer's standard "DANGER" signs of baked enamel finish on 20 gage steel; of standard red, black and white graphics; 14-inch by 10-inch size except where 10-inch by 7-inch is the largest size which can be applied where needed, and except where larger size is needed for adequate vision; with recognized standard explanation wording (e.g. HIGH VOLTAGE, KEEP AWAY, BURIED CABLE, DO NOT TOUCH SWITCH).
  - 1. At each entry doors of Electrical Rooms: "DANGER HIGH VOLTAGE – KEEP OUT, AUTHORIZED PERSONNEL ONLY"

## 2.6 LETTERING AND GRAPHICS

- A. Coordinate names, abbreviations and other designations used in the electrical identification work, with the corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of the electrical systems and equipment.

## 2.7 UNDERGROUND WARNING TAPE

- A. Three-inch minimum width, 5 mil thickness, foil bonded polyethylene tape, detectable type, with suitable continuous warning legend describing buried electrical lines. Tape color shall conform to APWA uniform color code using ANSI Z535.1 safety colors. Text shall be black, 2-inch minimum letters.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.
- B. Coordination: Where identification is to be applied to surfaces that require finish, install identification after completion of painting.

- C. Regulations: Comply with governing regulations and the requests of governing authorities for the identification of electrical work.

### 3.2 APPLICATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using screws, rivets, or adhesive.
- C. Secure nameplate to outside moveable surface of door on panelboard.
- D. Conduit Identification:
  - 1. Where electrical conduit is exposed in spaces with exposed mechanical piping, which is identified by a color-coded method, apply color-coded identification on the electrical conduit in a manner similar to the piping identification. Except as otherwise indicated, use orange as the coded color for conduit.
  - 2. Paint red band or provide red tape on each fire alarm conduit longer than 10 feet, minimum 20 feet on center.
- E. Cable/Conductor Identification:
  - 1. Apply cable/conductor identification on each cable and conductor in each box/enclosure/cabinet where the wires of more than one circuit or communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided.
  - 2. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.
- F. Operational Identification and Warnings
  - 1. Wherever reasonably required to ensure safe and efficient operation and maintenance of the electrical systems, and electrically connected mechanical systems and general systems and equipment, including the prevention of misuse of electrical facilities by unauthorized personnel, install self-adhesive plastic signs or similar equivalent identification, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for the intended purposes.
- G. Danger Signs
  - 1. In addition to the installation of danger signs required by governing regulations and authorities, install appropriate danger signs at the locations indicated and at locations subsequently identified by the Installer of electrical work as constituting similar dangers for persons in or about the project.
  - 2. High Voltage
    - a. Install danger signs wherever it is possible, under any circumstances, for persons to come into contact with electrical power of voltages higher than 110-120 volts.
    - b. Critical Switches/Controls
    - c. Install danger signs on switches and similar controls, regardless of whether concealed or locked up, where untimely or inadvertent operation (by anyone)

could result in significant danger to persons, or damage to or loss of property.

- H. Equipment/System Identification Signs
  - 1. Install an engraved plastic-laminate sign on each major unit of electrical equipment in the building; including the central or master unit of each electrical system and the communication/signal systems, unless the unit is specified with its own self-explanatory identification or signal system.
  - 2. Except as otherwise indicated or specified, provide single line of text, ½-inch high lettering on 1-1/2-inch high sign (2-inch high where two lines are required), white lettering in black field.
  - 3. Provide text matching terminology and numbering of the shop drawings.
  - 4. Provide signs for each unit of the following categories of electrical work
    - a. Major electrical switchboard
    - b. Electrical substation
    - c. Motor control center
    - d. Fire alarm control panel and annunciators.
    - e. Data / communications
  
- I. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrata with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrata.
  
- J. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.

END OF SECTION

## SECTION 26 24 16

### PANELBOARDS

#### PART 1 - GENERAL

##### 1.1 SECTION INCLUDES

- A. Lighting and appliance branch-circuit panelboards.

##### 1.2 SUBMITTALS

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
  - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
  - 3. Detail bus configuration, current, and voltage ratings.
  - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
  - 5. Include evidence of NRTL listing for series rating of installed devices.
  - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

##### 1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
  - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

##### 1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Keys: Two spares for each type of panelboard cabinet lock.

##### 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA PB 1.

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- D. Comply with NFPA 70.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations:
  - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Owner no fewer than five days in advance of proposed interruption of electric service.
  - 2. Do not proceed with interruption of electric service without Owner's written permission.
  - 3. Comply with NFPA 70E.

## 1.7 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

## PART 2 - PRODUCTS

### 2.1 DISTRIBUTION AND BRANCH CIRCUIT PANELBOARDS

- A. Manufacturers:
  - 1. Eaton
  - 2. Square D Co.
  - 3. Or Approved Equal.
- B. Product Description
  - 1. NEMA PB 1, circuit breaker type distribution, lighting and appliance branch circuit panelboard.
- C. Service Conditions:
  - 1. Temperature: 104 degrees F (40 degrees C) ambient
  - 2. Altitude: 100 feet (35 m) above sea level.
- D. Panelboard Bus
  - 1. Silver plated copper current carrying components, ratings as indicated on drawings.
  - 2. Main bus ampacity shall be equal to the main circuit breaker frame size rating.
  - 3. Furnish copper ground bus in each panelboard.
- E. Minimum integrated short circuit rating
  - 1. Panelboards rated 240-Volts - 18,000 amperes RMS symmetrical
  - 2. Panelboards rated 480-Volts - 42,000 amperes RMS symmetrical
  - 3. Circuit Breaker rating shall match or exceed the panel interrupting rating
  - 4. Series rated circuit breakers are not acceptable

- F. Enclosures: Surface-mounted cabinets.
  - 1. Rated for environmental conditions at installed location.
    - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
    - b. Outdoor: NEMA 4X, Stainless Steel
  - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
  - 3. Finishes:
    - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
    - b. Back Boxes: Same finish as panels and trim.
  - 4. Directory Card: Inside panelboard door, mounted in transparent card holder.

## 2.2 MOLDED CASE CIRCUIT BREAKERS

- A. NEMA AB 1, bolt-on type thermal magnetic and instantaneous magnetic trip circuit breaker. Circuit breaker thermal elements shall be of the bimetallic type and shall be capable of withstanding sustained overload and short-circuit currents without injury and without affecting the calibration of the bimetallic element. The thermal element shall have inverse time characteristics. The instantaneous elements shall trip the circuit breaker at the minimum standard trip setting.
- B. Provide common trip handle for multiple pole circuit breakers.
- C. Provide type SWD for lighting circuits and type HACR circuit breakers for air conditioning equipment circuits.
- D. Provide Class A ground fault interrupter circuit breakers as indicated on drawings.
- E. Trip rating shall be as indicated on drawings.
- F. Minimum integrated short circuit rating
  - 1. Circuit Breakers rated 240-Volts - 18,000 amperes RMS symmetrical
  - 2. Circuit Breakers rated 480-Volts - 42,000 amperes RMS symmetrical
  - 3. Circuit Breaker rating shall match or exceed the panel interrupting rating
  - 4. Series rated breakers are not acceptable

## 2.3 Surge Protection Device:

- A. IEEE C62.41-compliant, integrally mounted bolt-on, solid-state, parallel-connected, modular with field-replaceable modules type, with sine-wave tracking suppression and filtering modules, short-circuit current rating complying with UL 1449, second edition, and matching or exceeding the panelboard short-circuit rating, redundant suppression circuits, with individually fused metal-oxide varistors.
  - 1. Accessories:
    - a. Fuses rated at 200-kA interrupting capacity.
    - b. Fabrication using bolted compression lugs for internal wiring.
    - c. Integral disconnect switch.
    - d. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
    - e. LED indicator lights for power and protection status.
    - f. Six-digit, transient-event counter set to totalize transient surges.
  - 2. Peak Single-Impulse Surge Current Rating: 120 kA per mode/240 kA per phase.

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3. Minimum single-impulse current ratings, using 8-by-20-mic.sec. waveform described in IEEE C62.41.2.
  - a. Line to Neutral: 70,000 A.
  - b. Line to Ground: 70,000 A.
  - c. Neutral to Ground: 50,000 A.
4. Withstand Capabilities: 12,000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. surges with less than 5 percent change in clamping voltage.
5. Protection modes and UL 1449 SVR for grounded wye circuits with 480Y/277; 208Y/120-V, three-phase, four-wire circuits shall be as follows:
  - a. Line to Neutral: 800 V for 480Y/277; 400 V for 208Y/120.
  - b. Line to Ground: 800 V for 480Y/277; 400 V for 208Y/120.
  - c. Neutral to Ground: 800 V for 480Y/277; 400 V for 208Y/120.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- B. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- C. Mount panelboard cabinet plumb and rigid without distortion of box.
- D. Install overcurrent protective devices and controllers not already factory installed.
- E. Install filler plates in unused spaces.
- F. Comply with NECA 1.

### 3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 26 05 53.
- B. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 05 53.

### 3.4 ADJUSTING

- A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION

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SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wiring devices are defined as single discrete units of electrical distribution systems that are intended to carry but not utilize electric energy. The types of general purpose wiring devices required for the project include, but are not limited to the following line voltage devices:
  - 1. Connectors
  - 2. Plugs
  - 3. Receptacles
  - 4. Switches
  - 5. Wall plates

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. IEC 529 - Degrees of Protection provided by Enclosures.
- B. NEMA WD 1 - General Purpose Wiring Devices
- C. NEMA WD 6 - Wiring Device Configurations.

1.3 SUBMITTALS

- A. Product Data:
  - 1. Catalog cut of each device showing Manufacturer name, catalog number, voltage and current rating and dimensions.

1.4 REGULATORY REQUIREMENTS

- A. Furnish products listed and classified by UL, ETL, or other recognized, acceptable testing and listing agencies as suitable for the purpose specified and shown.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide factory fabricated wiring devices in the type, color, electrical rating for service indicated, and/or as shown on the drawings.

2.2 MANUFACTURERS

- A. Provide products produced by one of the following for each type of wiring device:
  - 1. Appleton
  - 2. Arrow-Hart, Inc.
  - 3. Bryant Electric Co.
  - 4. Crouse-Hinds Co.
  - 5. General Electric Co.
  - 6. Hubbell Wiring Device Division
  - 7. Pass & Seymour

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8. Pyle National
9. Wiremold (multi-outlet assemblies)
10. Or Approved Equal

**2.3 WALL SWITCHES**

- A. Provide specification grade, quiet type, flush, 1-pole, 2-pole, three and four-way toggle switches, 20 ampere, 120/277-volts AC, with mounting yoke insulated from mechanism equipped with plaster ears and side wired screw terminals, white plastic body with Decora rocker style action.
  1. Device Number: #5621-2W, #5622-2W, #5623-2W, #5624-2W
  2. Manufacturers: Leviton (or equal by Hubbell, Pass & Seymour, Cooper)

**2.4 RECEPTACLES**

- A. Provide specification grade, grounding type, heavy-duty, Decora receptacles with white plastic body, green hexagonal equipment ground screw terminal and grounding poles internally connected to mounting yoke; metal plaster ears; side wiring as follows:
  1. Duplex Receptacle: Two pole, 3 wire, 20-ampere, 125-volt duplex receptacle, NEMA configuration 5-20R unless otherwise indicated. Leviton #5362-W (or equal by Hubbell, Pass & Seymour, Cooper).
  2. GFCI Receptacle: Two pole, 3 wire, 20-ampere, 125-volt duplex receptacle with integral ground fault circuit interrupter to meet regulatory requirements. Leviton #T7899-W (or equal by Hubbell, Pass & Seymour, Cooper)
  3. Special Purpose: Two pole, 3 wire, 20-ampere, 125-volt single receptacle, twist-lock, NEMA configuration L5-20R as indicated.
  4. Special Purpose Receptacle: Type as required meeting the requirements of this Section and the equipment shown on the drawings and elsewhere specified.

**2.5 PLUGS AND CONNECTORS**

- A. Comply with NEMA Standards Publication No. WD-1. Provide 20 ampere, 125-volts, Bakelite body connectors, 3-wire grounding, parallel blades, double wipe contact, with cord clamp.
- B. Matching Insulgrip, corrosion resistant nylon plugs, IP20, shall be provided for each twist-lock type receptacles unless indicated otherwise.
- C. Manufacturers: Hubbell, Pass & Seymour, Bryant, or Approved Equal.

**2.6 WALL PLATES**

- A. Decorative Cover Plate: High impact, smooth nylon and smooth satin in finished areas. Color of nylon cover plate shall be ivory unless noted otherwise. Stainless steel cover plate in unfinished areas or where device is embedded in concrete.
- B. For areas where two separate power sources are provided, each power source receptacle shall have a different color cover plate such as black, gray, or brown. Emergency power source receptacles shall have a red cover plate.
- C. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device cover. Cover for duplex devices shall be designed such that each device is independently covered.

## 2.7 MULTI-OUTLET ASSEMBLIES

- A. Provide fixed multi-outlet assemblies consisting of #5362 grounding type, 20 ampere, 125-volt, two poles, three wire receptacles as an integral part, on 12-inch centers, unless otherwise noted.
- B. Where more than one circuit is indicated, do not connect adjacent receptacles to the same circuit. Include raceway snap-on covers with punched holes to accurately align receptacles.

## 2.8 HAZARDOUS RATED AREAS

- A. Switches, receptacles and other devices installed in hazardous areas shall be explosion-proof type in accordance with NFPA 70 and as shown on drawings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- D. Inspect each item of materials or equipment immediately prior to installation, and reject damaged and defective items.

### 3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface, if necessary.
- B. Clean debris from all boxes.

### 3.3 INSTALLATION

- A. Install wiring devices where indicated, in accordance with the manufacturer's written instructions, the applicable requirements of the NEC and the NECA "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve the intended function.
- B. Comply with the manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in the contract documents.
  - 1. Install devices plumb and level. Install switches with OFF position down
  - 2. Install vertically oriented grounded receptacles with grounding pole on top
  - 3. Connect wiring device grounding terminal to equipment grounding conductor.
  - 4. Connect isolated ground (IG) receptacle equipment (yoke) grounding terminal only at metallic box with bonding jumper
  - 5. Install decorative plates on switch, receptacle, and blank outlets in finished areas
  - 6. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets in utility areas. (Does not include multi-outlet assemblies, other similar locations.).
  - 7. Identify wiring devices as specified in Section 26 27 26.

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3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes to obtain mounting heights compliant with ADA. See drawings for specific mounting heights

3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.
- F. Verify that each telephone and data jack is properly connected and circuit is operational.

3.6 ADJUSTING

- A. Adjust devices and wall plates to be flush, plumb and level.

END OF SECTION

SECTION 31 05 13  
SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Subsoil materials.
  - 2. Topsoil materials.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 20 00 Price and Payment Procedures.

1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
  - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3  - 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3  - 4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).</sup></sup>

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Submit test data for controlled fill and select fill.

1.5 QUALITY ASSURANCE

- A. Furnish each subsoil and topsoil material from single source throughout the Work.
- B. Perform Work in accordance with Caltrans Standard Plans.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

- A. Select Fill:

1. On-site excavated and re-used material or Imported graded sand and gravel.
2. Free of lumps and rocks larger than 4 inches, and debris.
3. A maximum of 25% fines passing the No. 200 mesh sieve.
4. Conforming to ASTM D2487 Group Symbol GM or GC.
5. Contractor may use crushed concrete passing a 1" screen.

## 2.2 TOPSOIL MATERIALS

- A. Topsoil:
1. Topsoil material scraped from excavation areas and passing a 1" screen with characteristics similar to other materials listed in this section.
  2. Sandy loam.
  3. Reasonably free of roots, rocks larger than 1 inch, subsoil, debris, large weeds, and foreign matter.
  4. Acidity range (pH) of 5.5 to 7.5.
  5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.

## 2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Services for Testing and analysis of soil material.
- B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698. ASTM C136.
- C. When tests indicate materials do not meet specified requirements, change material and retest.
- D. Furnish materials of each type from same source throughout the Work.
- E. Testing frequency shall be one test for every 500 cubic yards of each type of imported soil.

## PART 3 EXECUTION

### 3.1 EXCAVATION

- A. Excavate subsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.
- B. Stockpile excavated material meeting requirements for subsoil materials.
- C. Remove excess excavated materials not intended for reuse, from site.
- D. Remove excavated materials not meeting requirements for subsoil materials from site.

### 3.2 STOCKPILING

- A. Stockpile in sufficient quantities to meet Project schedule and requirements.

- B. Separate differing materials with dividers or stockpile apart to prevent mixing.
- C. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

### 3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.
- B. Remove all debris from the site and leave the site in a neat and orderly condition.
- C. The Contractor shall handle and dispose of unsuitable and excess material legally, at refuse facility outside the Project site.
- D. All salvaged material remains the property of the Owner and shall be stockpiled by the Contractor where directed by the Owner.

END OF SECTION

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## SECTION 31 05 16

### AGGREGATES FOR EARTHWORK

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Coarse aggregate materials.
2. Fine aggregate materials.
3. Aggregate drain rock.

##### 1.2 RELATED SECTIONS

A. Section 31 05 13 – Soils for Earthwork

B. Section 31 23 16 – Trenching

##### 1.3 REFERENCES

###### A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.

###### B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
3. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

C. California Department of Transportation (Caltrans) Transportation Laboratory for the California Test Methods (CTM)

##### 1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submit name of imported aggregate material suppliers and test data.

##### 1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Caltrans Standard Specifications, 2022.

## PART 2 PRODUCTS

### 2.1 COARSE AGGREGATE MATERIALS

- A. Coarse Aggregate Base: where shown on the Plans.
  - 1. 100% Crushed Quarry Aggregate
  - 2. 1 ½" minus gradation
  - 3. Equal 100% crushed material.
  - 4. Other parameters for coarse aggregate base shall conform to Caltrans Standard Specifications Section 26-1.02B, Class 2 Aggregate Base.
- B. Pervious Backfill Material: Used as trench underdrain pipe bedding in new access road.
  - 1. Pervious backfill material shall conform to Caltrans Standard Specification Section 19-3.02D.
- C. Utility and Storm Drain Piping Backfill: Per Section 31 23 17 – Trenching of these Specifications.

### 2.2 FINE AGGREGATE MATERIALS

- A. Fine Aggregate (Sand): Per Section 31 23 17 – Trenching, of these Specifications.

### 2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing and inspection services.
- B. The materials referenced in this Section shall be tested in accordance with the most current test methods in use by Caltrans below:

<u>TEST</u>	<u>TEST METHOD NO. CALIF.</u>
Relative Compaction	231
Laboratory Compacted	216
Sand Equivalent	217
Sieve Analysis (Grading)	202
Percentage of Crushed Particles	205
Durability Index	229

## PART 3 EXECUTION

### 3.1 EXCAVATION

- A. Excavate aggregate materials from on-site locations indicated.
- B. Stockpile excavated material meeting requirements for coarse aggregate materials.
- C. Remove excess excavated materials not intended for reuse from site.
- D. Remove excavated materials not meeting requirements for coarse aggregate materials from site.

### 3.2 STOCKPILING

- A. Stockpile materials on site at locations designated by Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

### 3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

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SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Removing surface debris.
  - 2. Removing vegetation.
  - 3. Removing abandoned utilities.
  - 4. Excavating topsoil.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 20 00 Price and Payment Procedures.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Contractor to provide submittal that includes a list of all materials generated during construction activities that will require off-haul. Working with the Owner, the Contractor shall develop a list of off-site refuse disposal facilities, including contact information and list of items accepted for disposal at identified facility consistent with the Disposal Plan.
- C. Written proof the proposed disposal/recycling locations are permitted to receive said materials

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Caltrans Standard Plans.
- B. All vegetation areas proposed for removal are to be marked by the Contractor and approved by the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

### 3.2 PREPARATION

- A. Notify affected utility companies not less than three working days before performing Work.
- B. Request underground utilities to be located and marked within and surrounding construction areas.

### 3.3 PROTECTION

- A. Locate, identify, and protect utilities indicated to remain, from damage.
- B. Protect trees, plant growth, and features designated to remain, as final landscaping.
- C. Protect survey control points from damage or displacement.

### 3.4 CLEARING

- A. Clear areas required for access to site and execution of Work.

### 3.5 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Remove paving and concrete shown for demolition.
- C. Remove abandoned utilities if the utility conflicts with new pipeline. Indicated removal termination point for underground utilities on Record Documents.
- D. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- E. Do not burn or bury materials on site. Leave site in clean condition.

### 3.6 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or regraded, without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material, until disposal.
- D. Remove topsoil from site.
- E. The Contractor shall handle and dispose of unsuitable and excess material legally, at refuse facility outside the Project site.

END OF SECTION

## SECTION 31 23 16

### EXCAVATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Excavating for utilities.

##### 1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 20 00 Price and Payment Procedures.

##### 1.3 REFERENCES

- A. Local utility standards when working within 24 inches of utility lines.

##### 1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

##### 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with Caltrans Standard Plans.

#### PART 2 PRODUCTS (NOT USED)

#### PART 3 EXECUTION

##### 3.1 PREPARATION

- A. Notify affected utility companies and owner not less than three working days before performing Work.
  - 1. Request underground utilities to be located and marked within and surrounding construction areas. Conduct additional utility locating including ground penetrating radar, potholing and other means.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect plant life, and other features remaining as portion of final landscaping.
- E. Protect bench marks, survey control points and existing structures from excavating equipment and vehicular traffic.

### 3.2 EXCAVATION

- A. Excavate subsoil to accommodate utilities, structures, channels, swales, and other improvements.
- B. Compact backfills in accordance with Section 31 23 17 and the Contract Drawings.
- C. Slope banks with machine to angle of repose or less until shored.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders, and rock as specified in Section 31 05 13.
- H. Notify Owner of unexpected subsurface conditions.
- I. Correct areas over excavated with Class 2 Aggregate Base fill specified in Section 31 05 16.
- J. Remove excess and unsuitable material from site.
- K. Stockpile excavated material in area designated on site in accordance with Section 31 05 13.
- L. Repair or replace items indicated to remain damaged by excavation.

### 3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

### 3.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

## SECTION 31 23 17

### TRENCHING

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

A. Work included:

1. The Work covered in this Section consists of performing all operations necessary to excavate all earth, regardless of character and subsurface conditions, from the trench or adjacent thereto and to place stabilization, bedding, cover, water removal, backfill, base, and compaction as shown on the Contract Drawings and as specified or as may be ordered by the Owner.

B. General intent:

1. It is the general intent of these Specifications to specify conduct of the Work in such manner as to cause the general public a minimum of inconvenience with no exposure to unsafe conditions during construction and to provide a trench that will properly support and protect the pipe and have no settlement on improved streets and only minor settlement in other areas where such settlement will not be noticed, or compensation made for any expected settlement. The degree of compaction and type of material will vary in accordance with type of pipe, and soil and surface conditions.
2. The Contractor shall make effort to minimize environmental impacts and shall implement measures described in Section 01 57 00 - Temporary Controls.
3. The Contractor shall obtain compaction and install base and temporary paving promptly, to allow unimpeded traffic to resume as soon as possible.
4. If the Contractor does not properly clean up (in the opinion of the Engineer or the Owner) then the Owner shall have the option of using outside equipment and labor to perform the Work and such costs will be withheld from the Contract.
5. It is the general intent that where proper compaction and a stable surface can be obtained, native material would be used. Stabilization material and import will be provided by the Contractor only where directed by the Owner.
6. No backfilling shall be done until the installation to be covered has been inspected, tested, and approved for covering. Compaction of backfill shall proceed immediately after backfilling.

C. Related work described elsewhere:

1. Section 01 57 00 – Temporary Controls
2. Section 31 23 30 – Shoring and Trench Safety

##### 1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

2. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
3. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.3 SUBMITTALS

- A. Section 01 33 00 – “Submittal Procedures”: Requirements for submittals.
- B. Materials Source: Submit name of imported materials suppliers.
- C. Native Backfill: Submit gradation test, proctor test and sand equivalent test results.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Qualifications of workmen:
  1. Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.
- C. Codes and standards:
  1. Wherever a test method is referenced in this Section it shall be made in accordance with the most current test methods in use by the California Department of Transportation (Caltrans) as listed below:

<u>TEST</u>	<u>TEST METHOD NO. CALIF</u>
Relative Compaction	231
Laboratory Compacted Maximum Density	216
Sand Equivalent	217
Sieve Analysis (Grading)	202
Percentage of Crushed Particles	205
Durability Index	229

2. Where reference is made to the State Standard Specifications, reference shall mean: State of California, Business and Transportation Agency, Department of Transportation (Caltrans), Standard Specifications, most recent edition, excluding measurement and payment items.

1.5 GUARANTEES

- A. The Contractor shall guaranty his Work against settlement for a period of one (1) year after the Notice of Completion has been filed and shall repair all damage caused by settlement within that time. For the purpose of this Specification, settlement will be deemed to have occurred if the following conditions exist:
  1. On paved areas, the depression of 3/8-inch below the average of the sides of the uncut portion shall be deemed a settlement.

2. Along shoulder areas and unpaved portions of the site, a depression of 3/4-inch below the average of the sides of the uncut portion shall be deemed a settlement.
3. Across all areas untraveled by automotive equipment, a depression of 1-1/2-inches below the average of the sides of the uncut portion shall be deemed a settlement. In this regard, any settlement that causes drainage problems or concentration causing water to run along the ditchway shall be subject to correction immediately during the entire guaranty period.

## PART 2 PRODUCTS

### 2.1 EXCAVATION

- A. Excavation is unclassified. The Contractor shall complete all excavation regardless of type, nature, or condition of the materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials to be excavated in order to accomplish the Work. The Contractor should note Specifications for native backfill and determine where excavated material can be used for that purpose.

### 2.2 STABILIZATION MATERIAL

- A. The condition of the trench bottom may vary along the Project alignment. Where the trench bottom is found to be soft, loose, disturbed by construction activity, or otherwise unstable, over excavate until a firm base material is reached, or until such a depth that a firm base can be created by the placement of a layer of stabilization material.
- B. Stabilization material shall conform to the Caltrans Standard Specification Section 68-1.025, "Permeable Material". Use Class 2 Permeable Material
- C. Stabilization material shall consist of clean, durable, natural, crushed, angular aggregate that is uniformly graded. Stabilization material shall be free from excessive dirt or other organic material.

### 2.3 BEDDING AND COVER MATERIAL

- A. For Project areas, pipe bedding shall be Class 2, aggregate subbase conforming to Section 26 in the Caltrans Standard Specifications.

### 2.4 BACKFILL MATERIAL

- A. Backfill materials shall conform to the Caltrans Standard Specifications
- B. The percentage composition by weight in place shall conform to the grading as determined by Test Method No. California 202. Materials as delivered shall be of uniform mixture and shall be free of vegetative material and refuse.
- C. Method "A" Backfill:
  1. Backfill in streets and other traffic areas shall be Class 2 Aggregate Base in accordance with Caltrans Standard Specifications, Section 26. At the option of the Contractor, the grading for either the 1-1/2-inch maximum or 3/4-inch maximum shall be used, except that once a grading has been selected, the grading shall not be changed without the Owner's approval.

- D. Method "B" Backfill:
  - 1. Backfill in areas outside of the roadway shall be selected material excavated from the trench conforming to Specific Provisions Section 19 of the Caltrans Standard Specifications. Native backfill cannot be used for pipe bedding material. In all cases backfill material must be free from vegetative and deleterious substances and capable of compaction to at least the relative compaction required with in-place moisture, must not have a moisture content of five (5) percent over optimum. Native material over six (6)-inches from the pipe may have rocks or stones up to six (6)-inches in diameter provided they can be incorporated in the trench without bridging.
- E. For areas where cover is insufficient, use slurry cement backfill in accordance with Section 19-3.02D of the Caltrans Standard Specifications.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. The Contractor shall perform all excavation of whatever substance is encountered to the lines and grades shown on the Contract Drawings. All materials suitable for use as backfill shall be piled in an orderly manner a sufficient distance from the edge of the trench to avoid overloading and to prevent sliding into the trench. The Contractor shall do such grading or Work as is necessary to prevent surface water from entering the excavation.
- B. No more than 300 - feet of open trench shall be excavated in advance of laying the pipe. The maximum length of open trench at any given time shall be the distance in which pipe can be completely installed in a single day. Installed shall be defined as pipe laying, appurtenance construction, backfilling and compacting, temporary paving, and clean-up, complete in place. Installation of underground pipes and conduits shall be performed in one continuous operation and shall be carried out in an orderly fashion. Traffic through the Work area shall be impeded or obstructed as little as possible.

### 3.2 WIDTH OF TRENCH

- A. Except where otherwise specifically permitted, sides of trenches shall be vertical, shored as required, and shall be of uniform width from top to bottom. Trenches shall be of a width as shown on the detail sheets in the Contract Drawings. In no case shall the free working space on each side of the pipe be less than six (6)-inches.
- B. The maximum width of trench measured at the top of the pipe shall be kept to a minimum and not exceed the outside diameter of pipe plus 24-inches.
- C. If trench widths exceed those shown on the Contract Drawings, install all additional stabilization material, bedding and cover, backfill, base and paving in conformance with these Specifications at no additional cost to the Owner.

### 3.3 PAVING REMOVAL

- A. Asphalt concrete shall be saw cut and restored as shown in the Contract Drawings.

- B. All edges of asphalt, armor coats or seal coats shall be cut vertically, with a neat, square edge.
- C. In all cases existing paving shall be cut to a point at least six (6)-inches beyond each side of the trench line. If the trench line is within three (3) feet of any structure the pavement shall be removed and replaced to the structure.
- D. Asphalt grindings can be reused as backfill for pipeline trenching if the grindings comply with the gradations specified in this section 2.04 of these Specifications; however, any pavement removed and not used to backfill the trench shall be removed from the site and disposed of properly.
- E. Contractor's attention is directed to the General Conditions of section B-53, Protection of Person and Property. Pavement removal and replacement operations shall be performed in such a manner as adjacent pavement and subgrade are not disturbed. In the event that material underlying adjacent pavement is disturbed, Contractor shall re-compact it at Contractor's expense, to a relative compaction of not less than 95%.

#### 3.4 GRADE AND ALIGNMENT CONTROL

- A. Contractor shall construct the trench to the line and grades as shown on the Contract Drawings, or as established by the Owner. Proper allowance shall be made for pipe thickness, bedding material and stabilization material.
- B. Any part of the trench excavated in excess of the established grade shall be backfilled with stabilization or bedding material and compacted to a density equal to the undisturbed trench bottom at Contractor's expense.
- C. The pipe shall be accurately centered on alignment and shall be laid neat and true to provide good hydraulic characteristics in keeping with the grade and pipe size specified.

#### 3.5 SHORING, SHEETING AND BRACING

- A. General Conditions, Section B-52 - Safety.
- B. The Contractor shall furnish and install all shoring, sheeting and bracing required to support adjacent earth banks and structures for the protection and safety of all personnel working in the trench. All shoring, sheeting and bracing shall conform to the requirements of the State or local agents having jurisdiction over such matters.
- C. Remove shoring, sheeting and bracing in a manner that will protect the workman and prevent caving of banks and damage to the pipe, excavation, backfill or adjacent property. See specific details elsewhere in these Specifications and in Cal OSHA requirements.
- D. Minimum compaction requirements must be met after shoring is removed.

#### 3.6 STABILIZATION

- A. If unstable trench bottoms are encountered, additional excavation shall be performed to the depth ordered by the Owner. Trench stabilization material shall then be placed up to the bottom plane of the bedding material. Separate payment shall be authorized in the form of a contract change order for a unit cost per cubic

yard. The amounts shall be calculated by the theoretical quantity obtained by multiplying the trench width, up to the maximum widths shown on the Contract Drawings times the depth requested times the length, all as authorized by the Owner.

### 3.7 TRENCH BACKFILL IN THE PIPE ZONE

- A. The Contractor shall backfill the pipe zone with the bedding and cover material specified to the dimensions shown on the Contract Drawings. Bedding material shall first be placed and compacted so that the pipe is supported for the full length of the barrel with full bearing on the bottom segment of the pipe equal to a minimum of 40 percent of the outside diameter of the barrel. Additional bedding shall then be installed and the sides of the pipes tamped to not less than 95 percent compaction to secure full length bedding and proper pipe wall support. After this, cover material shall be added and mechanically compacted to a relative compaction not less than 95 percent in road areas and not less than 90 percent in non-road areas with native backfill material.
- B. In trench bottoms that are wet with running water or rapidly infiltrating water, the trench shall be kept dry until laying and joining of the pipe and placing of the bedding material has been completed, inspected and approved. The Contractor shall over-excavate and place a minimum of six (6)-inches of permeable material or dewater the trench in a manner which has received prior approval of the Owner.

### 3.8 TRENCH BACKFILL

- A. Method A is to be used in existing streets. The area above the pipe zone shall contain Class II Aggregate base compacted to a minimum relative compaction of 95 percent and a temporary layer (1-inch minimum and 2-inch maximum) of asphalt cutback placed to grade. This temporary cutback shall be maintained by the Contractor to within 1/4-inch of finished grade until permanent paving is installed as described in Section 32 12 16 – “Hot Mix Asphalt Pavement and Overlays.”
- B. Method B is to be used in unimproved or non-street right-of-way areas. The area of the trench between the bedding zone and the top of trench shall be backfilled with native material. Compaction shall be done mechanically in uniform lifts not exceeding 1-foot max so as to attain a minimum relative compaction of 90 percent.

### 3.9 JETTING

- A. Jetting shall not be allowed.

### 3.10 COMPACTION

- A. General:
  - 1. Place and assure bedding, backfill, and fill materials achieve an equal or "higher" degree of compaction than undisturbed materials adjacent to the Work.
  - 2. In no case shall degree of compaction below "Minimum Compaction" specified be accepted.
- B. Compaction Requirements:

1. Unless noted otherwise on the Contract Drawings or more stringently by other sections of these Specifications, comply with following trench compaction criteria:

LOCATION	TRENCH BACKFILL IN THE PIPE BEDDING ZONE	TRENCH BACKFILL	SUBGRADE
Caltrans and Del Norte County Right-of-Way			
Paved Area	90%	95% (3.5' below finished grade)	95%
Unpaved Area	90%	95%	-

### 3.11 FIELD QUALITY CONTROL

#### A. Testing:

1. Contractor will provide and pay for services of an independent soils laboratory to conduct field tests and to prepare test reports.
2. The Contractor's testing laboratory will conduct all tests when advised by the Contractor that, in his opinion, sufficient densities have been achieved. Perform no less than one relative compaction test for every one-and-a-half foot of depth per 200 foot of trench or as directed by the Owner (example: 300 foot of trench 3 foot deep will have a minimum of 3 relative compaction tests). The Contractor shall furnish a backhoe and operator upon request to the testing laboratory, at no cost to the Owner. Compaction testing shall occur on a daily basis and be certified by the Contractor as meeting Project requirements.
3. Perform additional compacting effort or re-work as required until compaction meets or exceeds requirements at no extra cost to the owner.
4. Ensure excavations are safe for testing personnel.

END OF SECTION

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SECTION 31 23 19

DEWATERING

PART 1 GENERAL

1.1 DESCRIPTION

- A. Groundwater is anticipated in this project. The Contractor is advised that groundwater may be present in some of the proposed excavations, depending on site location, depth of excavation, soil conditions and time of year. As necessary, the Contractor shall keep excavations free from water during construction.
- B. The Contractor shall provide all labor, materials, and equipment necessary to dewater trench and structure excavations, in accordance with the requirements of the Contract Documents, to enable the pipes and structures to be installed in excavations that are free from standing or flowing water that may be due to groundwater, surface water, stormwater or precipitation.
- C. The preferred disposal method for water removed from trenches and other excavations is through percolation into the ground. Alternative disposal locations require Owner approval.
- D. The Contractor shall be responsible for all permits and fees associated with such discharges.
- E. The Contractor shall develop an excavation dewatering plan in accordance with paragraph 1.5.A of this Section.
- F. The Contractor shall qualitatively monitor for odor or visual discrepancies indicative of hydrocarbon contamination in groundwater during dewatering operations. The Contractor shall notify the Owner immediately if potential contamination is encountered.
- G. The Contractor's dewatering operations shall not interfere with vehicle or pedestrian traffic. Under no circumstances shall dewatering water be allowed to flood streets and cause hazardous conditions for vehicular or pedestrian traffic. Dewatering pump noise shall be mitigated, especially at night. Any mitigating measures taken to conform to these requirements shall be at no extra expense to the Owner.
- H. The Contractor shall obtain any and all permits required in conjunction with dewatering operations, including permits for construction of dewatering wells.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- a. Section 02 00 00 – Existing Conditions
- b. Section 31 23 17 – Trenching
- c. Section 31 23 33 – Shoring and Trench Safety

### 1.3 DEFINITIONS

- A. Dewatering: Practices that manage the discharge of groundwater and accumulated precipitation from a work location so that construction work may be accomplished.

### 1.4 DISCHARGE TO COLLECTION SYSTEM

- A. No water shall be discharged into sanitary sewers without the prior written consent of the Owner and 24 hours advance notice to the Owner.
- B. If local jurisdiction turbidity requirements are not met by tank settling alone, a filter must be employed to remove soil particles from the groundwater prior to discharge.
- C. Testing of water samples for turbidity shall be performed and documented daily for the first week, then at weekly intervals during the remaining period of discharge. Water shall only be discharged if the sample test results meet the specified turbidity requirements. A log of the monitoring and sampling results shall be maintained.
- D. The Contractor shall coordinate groundwater discharge into the collection system with the Owner, including verifying water quality requirements, discharge flow limitations into the collection system, and location of discharges into the collection system.
- E. In no case shall the Contractor's groundwater disposal operation surcharge the collection system (i.e., full pipe flow).
- F. The costs associated with any damage caused as a result of Contractor's groundwater disposal operation surcharging the collection system shall be the Contractor's sole responsibility.

### 1.5 SUBMITTALS

- A. Submit all plans, product data, shop drawings, laboratory test results, material source information, and certificates of compliance listed in this Section under a single submittal cover for review. Incomplete submittals will not be reviewed.
- B. Dewatering Plan
  - 1. Dewatering systems shall be designed and maintained by the Contractor and shall be coordinated with the design of shoring specified in Section 31 01 40, "Shoring and Trench Safety." The plans should contain at a minimum the sizes of pumps, tanks, filtration devices, and the points of disposal. The plan should also include alternate (contingent) systems, and the Contractor should be prepared to alter the initial dewatering or shoring systems to meet the specified requirements.
  - 2. The plan shall also include applicable water quality requirements.
- C. Section 01 33 00 – Submittal Procedures.
- D. Product Data: Submit data for each of the following:
  - 1. Dewatering Pumps: Indicate sizes, capacities, priming methods, and engine or motor characteristics.
  - 2. Pumping equipment for control of discharge.
  - 3. Size of tank(s) used for storage.

4. Specifications and size and type of filters and any other materials used for filtration.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Section 01 33 00 – Submittal Procedures.
- B. Once the storage tank(s) are no longer needed, clean and remove from the site and return the area to original condition.

#### 1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing work of this Section.

#### 1.8 SEQUENCING

- A. Section 01 11 00 – Summary of Work: Requirements for sequencing.
- B. Convene minimum one week prior to commencing work of this Section.

#### 1.9 COORDINATION

- A. Coordinate work to permit the following construction operations to be completed on stable substrate.
  1. Excavation for structures and pipelines as specified in Section 31 23 17 - Trenching.
- B. Coordinate with the Owner prior to the commencement of any soil excavation and groundwater discharge.
- C. All dewatering operations shall be adequate to assure the integrity of the finished project.

### PART 2 PRODUCTS

#### 2.1 DEWATERING EQUIPMENT

- A. Select dewatering equipment to meet specified performance requirements.

### PART 3 EXECUTION

#### 3.1 DEWATERING OPERATIONS

- A. Install dewatering system in accordance with the approved Dewatering Plan.
  1. Secure Owner approved areas for siting of groundwater storage tanks and treatment systems. Located system components to allow continuous dewatering operations without interfering with the excavation work.
  2. Install the dewatering system in accordance with State, local and Unified Building Code standards.

- B. Remove water from the excavation in accordance with the approved Dewatering Plan.
  - 1. Keep excavations free from water during construction.
  - 2. Draw down the static water level a minimum of 2 feet below the bottom of excavations to maintain the undisturbed state of natural soils and allow the placement of any fill to the specified density.
  - 3. Operate dewatering systems continuously until backfill has been completed to 1-foot above the normal static groundwater level.
  - 4. Control the release of groundwater to its static level to prevent disturbance of the natural foundation soils or compacted fill and to prevent floatation or movement of structures and pipelines.
  - 5. Control groundwater to prevent softening of the bottom of excavations, or formation of "quick" conditions. Dewatering systems shall not remove natural soils.
  - 6. At all times, site grading shall promote drainage away from excavations. Surface runoff shall be diverted from excavations.
  - 7. Dewatering in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.
  - 8. Control surface runoff to prevent entry or collection of water in excavations.
  
- C. Notify the Owner and stop excavation work should the dewatering system not adequately control water within the excavation.
  - 1. Supplement or modify dewatering system and provide other remedial measures to control water within excavation.
  - 2. Demonstrate dewatering system operation complies with performance requirements before resuming excavation operations.
  
- D. Notify the Owner and stop excavation work if potentially contaminated groundwater is encountered.
  - 1. Upon notification from the Contractor regarding potential groundwater contamination, the Owner will sample and analyze to verify the existence and extent of contamination.
  
- E. Notify the Owner and stop excavation work if settlement or ground movement is detected.
  - 1. Contractor shall control the rate and effect of the dewatering in such a manner as to avoid all settlement and subsidence.
  - 2. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at daily intervals to detect any settlement or ground movement that may develop. The Contractor shall conduct the dewatering operation in a manner that protects adjacent structures and facilities. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor.
  
- F. Maintain all equipment in an operable state.
  - 1) Inspect equipment daily and repair or replace as needed.
  - 2) Clean accumulated sediment from tanks as needed.
  
- G. Remove dewatering systems after dewatering operations are discontinued.

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1. The Contractor shall be responsible for sampling and disposal of sediments collected in storage tanks, as well as other waste materials related to groundwater discharge.
2. Repair damage caused by dewatering systems or resulting from failure of systems to protect property.

END OF SECTION

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## SECTION 31 23 33

### SHORING AND TRENCH SAFETY

#### PART 1 GENERAL

##### 1.1 SUMMARY OF SECTION

- A. Principle items specified herein are:
  - 1. Shoring required for general safety, worker protection and protection of adjacent property from the hazards of caving ground.
  - 2. Trench excavations
  - 3. Structural excavations

##### 1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 15 00 Measurement and Payment.

##### 1.3 RELATED SECTIONS

- A. Related work specified in other sections:
  - 1. Section 31 23 17 – Trenching
  - 2. Section 31 05 13 – Soils for Earthwork

##### 1.4 REFERENCED CODES AND SPECIFICATIONS

- A. Cal/OSHA, State of California Administrative Code, Title 8; Industrial Relations, Chapter 4, Subchapter 4, Construction Safety Orders.
- B. Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR Part 1926 Subpart P - Excavations.
- C. Where any of these are in conflict, the more stringent requirements shall be adhered to.

##### 1.5 CONTRACTOR'S RESPONSIBILITIES FOR SAFETY

- A. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons (including employees) and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours.
- B. The duty of the Owner and Engineer to conduct construction review of the Contractor's performance is not intended to include a review or approval of the adequacy of the Contractor's safety supervisor, the safety program, or any safety measures taken in, on, or near the construction site.
- C. The Owner and Engineer will review the submittal of the Contractor's proposed shoring system to verify the general scope of the Work, to determine that qualified professional engineering services are used and to determine that appropriate

construction techniques are proposed for use. This review shall not in any way be construed to relieve the Contractor from sole responsibility for the design and safety of such shoring.

- D. The Contractor shall appoint a supervisory employee who shall be responsible for determining which of the engineered shoring systems (if alternates are provided) shall be used depending on local soil type, water table, etc.

#### 1.6 PERMIT

- A. For trenches or excavations five feet or more in depth, obtain from the State Division of Industrial Safety a permit for such excavation; submit one (1) electronic copy of the permit to the Owner, prior to initiating any work requiring said permit.

#### 1.7 SAFETY ORDERS

- A. The Contractor shall have at the work site, copies or suitable extracts of the Construction Safety Orders of Cal-OSHA.
- B. All work shall comply with the provisions of these and all other applicable laws, ordinances and regulations.

#### 1.8 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 – Submittal Procedures:
- B. Trench Safety Plan:
  - 1. For trenches or excavations five feet or more in depth, the Contractor shall submit to the Owner a detailed plan design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazards of caving ground. The design shall be coordinated with other relevant specification sections. Such plans shall be submitted at least ten (10) working days before the Contractor intends to begin trenching or excavation work. Submittal shall be for trench work and work at vaults, and other cuts 5 feet or more in depth. NOTE: Water table and moisture content will vary with rainfall and cause varying soil strength.
  - 2. Groundwater may be present in trench backfill of existing utilities. Contractor shall design shoring and dewatering systems to mitigate against washout of materials from existing utility trenches. Reconstruction of the structural section of the road will be completed at the Contractor's expense.
  - 3. The trench safety plans shall be prepared, stamped and signed by a civil or structural engineer registered in California. Stamped and sealed copies of calculations necessary to obtain approval of the systems shall be submitted also. These plans shall be available at all times at the job site.
  - 4. Nothing herein shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety.

PART 2 PRODUCTS - Not used

PART 3 EXECUTION

3.1 REMOVAL OF SHORING

- A. Removal of shoring shall not damage pipe or structures, cause settlement or heave the ground surface, or produce vibrations that could damage adjacent pipe or structures.
- B. Minimum compaction requirements must be met after shoring is removed.

PART 4 TESTING

- 4.1 No field testing is required.

END OF SECTION

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SECTION 31 25 13  
EROSION CONTROLS

PART 1 GENERAL

1.1 GENERAL

- A. The work of this section consists of furnishing and installing temporary erosion and sediment control measures necessary to prevent, control and abate water, mud, and erosion damage to public and private property as a result of the construction project.
- B. Implementing measures to prevent storm water pollution during construction activities, in accordance with federal, state, and local regulations.
- C. Minimize the extent of all ground disturbing activities and avoid work in any drainage channels if at all feasible.
- D. Heavy equipment shall be placed outside of drainage channels except when absolutely necessary to perform the work.
- E. Upon completion of construction activities, natural drainage shall be restored and re-contoured as nearly as practicable to pre-project conditions, and shall match adjacent natural channel contours.

1.2 MEASUREMENT AND PAYMENT

- A. Refer to Section 01 20 00 Price and Payment Procedures.

1.3 SUBMITTALS

- A. Mill Certificate or Affidavit. A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified below.

1.4 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM D4439-04 - Standard Terminology for Geosynthetics.
  - 2. ASTM D4491-99a(2009) - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - 3. ASTM D4533- 04(2009) - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
  - 4. ASTM D4632-08 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
  - 5. ASTM D4751-04 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.

6. ASTM D4873-02(2009) - Standard Guide for Identification, Storage, and Handling of Geosynthetic Roles and Samples.

## 1.5 EROSION AND SEDIMENT CONTROLS

- A. The controls and measures required by the Contractor are described but not limited to the items below.
  1. Structural Practices: Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include the following devices.
    - a. Silt Fences. The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly placed and installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, trench excavation, backfilling, and grading). Silt fences shall be installed in the locations as directed by the Engineer. Final removal of silt fence barriers shall be upon approval by the Engineer.
    - b. Straw Wattles (Fiber Rolls): Contractor shall provide fiber roles as temporary structural practice to minimize erosion and sediment runoff. Fiber roles shall be properly placed and installed to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, trench excavation, backfill, and grading) in each independent runoff area (e.g., after clearing and grubbing in an area between a ridge and drain, fiber roles shall be placed as work progresses; fiber roles shall be removed/replaced/relocated as needed for work to progress in the drainage area). Final removal of fiber role barriers shall be upon approval by the Engineer. Fiber Roles shall be installed as directed by the Engineer and as shown in the Project Drawings.
    - c. Seed and Mulch: per plans and specifications.

## PART 2 PRODUCTS

### 2.1 SILT FENCES

- A. Ultraviolet stabilized woven polypropylene face. The filter fabric shall meet the following requirements:

Physical Property	Test Procedure	Required Value
Grab Tensile	ASTM D 4632	160 lbs. min.
Elongation (%)	ASTM D 1682	25 % max.
Mullen Burst Strength, psi, min.	ASTM D 3876	350
Equivalent Opening Size, max.	US Standard Sieve	30-70

Ultraviolet Radiation Resistance, % Strength Retention	ASTM D 4355	70
Weight oz./sq. yd.	ASTM D 3776	4

- B. Mill Certificate or Affidavit. A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above.
- C. The Contractor may use either wooden stakes or steel posts for silt fence construction.

## 2.2 FIBER ROLES (SEDIMENT LOGS OR WATTLES)

- A. Composed of bio-degradable materials.
- B. The Contractor shall use wooden stakes for fiber role installation. Wooden stakes utilized for fiber role installation, shall have a minimum cross section of 1 inch by 2 inches, or as suggested by the fiber role manufacturer.

## PART 3 EXECUTION

### 3.1 SPECIAL CONSTRUCTION REQUIREMENTS

- A. It is the responsibility of the Contractor to minimize erosion and prevent the transport of sediment to the adjacent stream and sensitive areas.
- B. At a minimum, the Contractor shall employ best management practices (BMPs) as described in the Project Plans.
- C. If discrepancies occur between these specifications, plans, material referenced herein or manufacturer's recommendations, then the most protective shall apply.
- D. It is the responsibility of the Contractor to fix any erosion, sediment, pollution, & waste control deficiencies identified by the Engineer.
- E. Other selected disturbed earth areas shall be treated using appropriate erosion control measures per plans and specifications.
- F. Additional erosion/sediment BMPs beyond what is shown on the plans may be required to comply with project permits and it shall be the responsibility of the contractor to implement additional BMPs as needed and as directed by the construction manager at no additional expense to the Owner.
- G. Changes to the Plans may be made to respond to field conditions. Changes shall be noted on the plan when made.
- H. At the conclusion of construction of certain task elements, the contractor will be required to implement additional post-construction erosion control measures where

specified in the plans or where directed by the Engineer in order to protect natural resources. These measures include, but are not limited to, installing seed, weed-free straw mulch and tackifier, weed-free straw wattles or fiber roles, and erosion control blanket consistent with the Project Plans.

### 3.2 INSTALLATION OF SILT FENCES

- A. Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Engineer.
- B. Maximum spacing for post supports shall be 6 feet on center. Posts shall be buried 12 inches minimum and shall not exceed 36-inches above the ground surface.

### 3.3 INSTALLATION OF FIBER ROLLS (SEDIMENT LOGS OR WATTLES)

- A. Fine grade the subgrade by hand, dressing where necessary to remove local deviations and to remove larger stones or debris that will inhibit intimate contact of the fiber roll with the subgrade. Prior to roll installation, contour a concave key trench 2 to 4 inches deep along the proposed installation route. Soil excavated in trenching should be placed on the uphill or flow side of the roll to prevent water from undercutting the roll.
- B. Place fiber rolls into the key trench and stake on both sides of the roll within 6 feet of each end. Spacing for stakes shall be 3 to 5 feet. Stakes are typically driven in on alternating sides of the roll. Stakes shall be buried 12 inches minimum.
- C. When more than one fiber roll is placed in a row, the rows should be abutted securely to one another to provide a tight joint, not overlapped. Fiber rolls shall be placed in a single row, lengthwise on the contour.

### 3.4 MAINTENANCE

- A. The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, 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. The following procedures shall be followed to maintain the protective measures.
  - 1. Silt Fence Maintenance. Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of

the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be re-vegetated.

2. Fiber Roll Maintenance. Fiber roll barriers shall be inspected in accordance with section 3.5 below. Close attention shall be paid to the repair of damaged roles, end runs and undercutting beneath roles. Necessary repairs to barriers or replacement of roles shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the barrier. Roll rows used to retain sediment shall be turned uphill at each end of each row. When a fiber roll barrier is no longer required, it shall be removed. The immediate area occupied by the roll and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be re-vegetated.

### 3.5 INSPECTIONS AND ACCEPTANCE

- A. General. The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and areas where vehicles exit the site, at least once every seven (7) calendar days, within two (2) calendar days of forecasted rains, and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site.
- B. Inspection Details. Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

END OF SECTION

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SECTION 32 12 16

HOT MIX ASPHALT PAVEMENT AND OVERLAYS

PART 1 GENERAL

1.1 DESCRIPTION

- A. Work included: Work covered in this section consists of performing all operations necessary to base and pave roadways or repair paved areas affected by Contractor's operations. Items covered under this Section include subgrade preparation, base, aggregate base, Hot Mix Asphalt (HMA) paving, crushed rock surfacing and traffic striping and markings.
- B. General intent: All roadway surfaces shall be replaced in a manner which will result in a surface equal to or better than that existing prior to the trenching operations. Asphalt paving shall be replaced with a minimum thickness of 0.25'. See details on the Contract Drawings.
- C. Related Work described elsewhere:
  - 1. Section 31 23 17 - Trenching
  - 2. Section 03 33 00 - Cast-In-Place Concrete
- D. References
  - 1. State of California, Business and Transportation Agency, Department of Transportation (Caltrans), Standard Specifications, latest edition excluding measurement and payment items.

1.2 QUALITY ASSURANCE

- A. Qualifications of workers: Provide sufficient skilled workers and supervisors who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.
- B. Codes and standards:
  - 1. Wherever a test method is referenced in this section, it shall be made in accordance with the most current test method in use by the California Department of Transportation (Caltrans) in the State Standard Specifications, latest edition.
  - 2. All pavement testing will be performed by the Contractor.
- C. Prior to beginning Work, the Contractor shall submit the company name, name of the contact person, and phone number of the Caltrans-certified lab that will be performing compaction and materials testing. Additionally, the lab shall be required to submit a copy of their Caltrans certification to the Engineer prior to the Contractor starting Work. The lab shall be required to submit copies (fax to Engineer) of all test results within 24 hours of completing tests. Tests are to be clearly marked with the California test # (ASTM where applicable).

### 1.3 SUBMITTALS

- A. Contractor shall submit samples of aggregate base, crushed rock, and aggregate for asphalt concrete prior to actual construction. Periodic tests of the material may also be made during construction. Contractor shall submit in written certifications materials testing reports, job-mix formulas, and other pertinent information demonstrating that materials and methods comply with the Contract requirements.

### 1.4 PRODUCT HANDLING

- A. All products described herein shall be handled in conformance to the applicable provisions of the Standard Specifications.

### 1.5 GUARANTEES

- A. All guarantees shall conform to the provisions of Section 31 23 17 - "Trenching" and other portions of these specifications.

## PART 2 PRODUCTS

### 2.1 AGGREGATE BASE

- A. Aggregate base shall be per Section 26 of the Caltrans Standard Specifications.
- B. Base shall be placed on an unyielding excavated and drained subgrade. The top 12 inches of subgrade shall be compacted to a relative compaction of 95%.
- C. Aggregate base shall be lime treated if so directed by the Engineer.
- D. Aggregate base shall be Class 2, 1/2 inch maximum grading conforming to Section 26 of Caltrans Standard Specifications.

### 2.2 PAINT BINDER (TACK COAT)

- A. Tack coat if utilized shall be emulsified asphalt Grade RS1, SS1, or SS1h and shall conform to Section 94, "Asphaltic Emulsions", of the Caltrans Standard Specifications.

### 2.3 HOT MIX ASPHALT

- A. Asphalt concrete Type B shall be per Section 39-1.01 of the Caltrans Standard Specifications.
  - 1. Add to Section 39-1.01 of the Caltrans Standard Specifications:
    - a. Produce and place HMA Type A under the METHOD construction process.
- B. Asphalt binder per Section 39-1.02C of the Caltrans Standard Specifications.
  - 1. Liquid anti-stripping agent (LAS) shall be added to the asphalt binder at a rate of 0.5% by weight of asphalt binder. The LAS shall be AD-here LOF 65-00 or

equivalent, and shall be stored, measured, and blended with the asphalt binder in accordance with the anti-stripping agent manufacturer's recommended practice. The LAS can be added at the asphalt plant or at the refinery. When added at the asphalt plant, the equipment shall indicate and record the amount of LAS added. If added at the refinery, the shipping ticket from the refinery shall certify the type and amount of LAS added.

2. Add to Section 39-1.02C of the Caltrans Standard Specifications:
  - a. Asphalt binder used in HMA Type A must be PG 64-16
  
- C. Aggregate per Section 39-1.02E of the Caltrans Standard Specifications:
  1. Add to Section 39-1.02E of the Caltrans Standard Specifications:
    - a. Aggregate used in HMA Type A must comply with ½-inch HMA Type A and B gradation.
  
- D. The asphalt concrete mixture, for asphalt concrete surface and asphalt concrete base, shall conform to the following requirements:
  1. Minimum tensile strength ratio (TSR) of 70, and a minimum dry tensile strength of 65 pounds per square inch, based on California Test Method 371.
  2. At any time during the first 12 months from the time of placement of the asphalt concrete, the surface shall be visually inspected by the Owner and the County. If signs of stripping of binder from aggregate or loss of aggregate is apparent, the Owner shall core the asphalt concrete surface. The core samples shall be tested for TSR. Asphalt concrete with a TSR less than 70 shall be remediated as required by the Owner.
  3. An HMA mix shall be submitted to the Engineer two weeks prior to the commencement of paving operations.

**2.4 CRUSHED ROCK SURFACING**

- A. Crushed rock shall be 3/4-inch maximum and gradation shall conform to the following:

Sieve Size	Percent Passing Sieve
1"	100
3/4"	90-100
1/2"	30-60
3/8"	0-20
No. 4	0-5
No. 8	--

- B. Crushed rock shall meet the requirements of test method ASTM C131 (test grading B). Percent wear for testing shall be 15 percent maximum for 100 revolutions and 52 percent maximum for 500 revolutions.

**2.5 TRAFFIC STRIPES AND MARKINGS**

- A. Traffic stripings or markings shall be white or yellow colored thermoplastic material. Materials shall conform to material standards for painted stripings or markings referenced in Section 84 of the Caltrans Standard Specifications.

## 2.6 PAVEMENT MARKERS

- A. Reflective Markers
  - 1. Reflective markers shall be Type B or Type H reflective markers as defined in Section 85 of the Caltrans Standard Specifications.
- B. Non-Reflective Markers
  - 1. Non-reflective markers shall be Type A or Type AY non-reflective markers as defined in Section 85 of the Caltrans Standard Specifications.

## PART 3 EXECUTION

### 3.1 PROTECTION OF EXISTING STREET SURFACE

- A. During the entire construction period, the Contractor shall take care to protect existing pavement or sealed surfaces. Backhoes and trenchers must have street pads. Grossers or metal tipped pads will not be allowed. Surfaces scarred by cleanup or excavation equipment shall be repaired in a manner satisfactory to the Engineer. Any and all damage caused by the Contractor's operations to existing roads and streets shall be repaired by the Contractor to at least the original condition and to the satisfaction of the Engineer, at no additional cost to the Owner.
- B. If pavement is damaged (excessive loading, grouser marking, scarring/scraping of pavement, etc.) in adjacent lanes, a full lane width grinding and overlay will be required as directed by the Owner. If pavement is damaged due to excessive loading near the trench wall causing openings in the pavement, full depth structural section replacement will be required as directed by the Owner. If pavement restoration comes to within 4 feet from the edge of the pavement or lip of gutter/curb, pavement shall be replaced to the lip of gutter/curb.

### 3.2 PAVING REMOVAL

- A. Sawcutting shall be required for all roads. See Section 31 23 17 "Trenching" for paving removal requirements.

### 3.3 AGGREGATE BASE

- A. Aggregate base shall be spread and compacted according to Caltrans Standard Specification Section. Compact to 95 percent relative compaction.

### 3.4 PAINT BINDER (TACK COAT)

- A. Paint binder application shall conform to the provisions of Section 39 of the Caltrans Standard Specifications. Areas to be primed are all areas to be paved. Paint binder shall be utilized on existing asphalt and concrete surfaces.
- B. Where temporary paving has been removed, the Contractor shall re-compact. A tack coat shall be applied to all existing or temporary pavement that will be in contact with the final pavement.

- C. Apply paint binder at 0.10 gallons per square yard over existing paved areas.
- D. The cost of applying tack coat will be considered included in the Contract Price and no additional compensation will be allowed therefore.

### 3.5 HOT MIX ASPHALT SURFACING

- A. Paving shall be conducted in accordance with the requirements listed in Section 39 of the Caltrans Standard Specifications.
- B. Place asphalt within eight (8) hours of applying primer or tack coat.
- C. Paving shall be done under suitable weather conditions for such operations. Temperature shall be as specified in Section 39-3.04 of the Caltrans Standard Specifications. Rain, snow or other inclement weather will be cause for discontinuing paving Work. The Engineer shall have the authority for determining whether weather conditions are sufficient cause to discontinue paving.
- D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

### 3.6 TRENCH PATCHING

- A. All trench patches in County streets shall conform to Caltrans Standard Specification.

### 3.7 CRUSHED ROCK SURFACING

- A. Crushed rock surfacing shall be spread and compacted in maximum lifts of six (6) inches.

### 3.8 TRAFFIC STRIPES AND MARKINGS

- A. Traffic stripings and markings shall be replaced at all locations where removed for completion of the Work. Application shall be in accordance with Section 84 of the Standard Specifications.
- B. Painted stripping or marking material shall be applied only to dry surfaces during favorable weather. When using acetone-based paint, the air temperature shall be at least 40 degrees F. When using water-based paint, the air temperature shall be at least 50 degrees F. Glass beads shall be applied at a rate of five pounds per gallon of paint and be uniformly incorporated in all coats of paint.
- C. Surfaces to receive stripping or marking material shall be cleaned of all dirt and loose material.
- D. Drips, overspray, improper markings, and paint material damaged by construction traffic shall be removed and replaced at the Contractor's expense.

### 3.9 PAVEMENT MARKERS

- A. Pavement markers shall be replaced in kind and number where removed for completion of the Work with new, unused material as specified herein. Application shall be in accordance with Section 85 of the Standard Specifications.
- B. Placement shall be to the alignment established by the Contractor and approved by the Engineer. Reflective face of marker should be perpendicular to roadway centerline.
- C. Markers shall be cemented to the pavement with Rapid Set-Type adhesive conforming to Section 95.2.04 of the Standard Specifications.
- D. Markers shall not be placed under following conditions:
  - 1. When either the pavement or the air temperature is 40 degrees F or less.
  - 2. If the relative humidity of the air is greater than 80 percent.
  - 3. If pavement is not surface dry.
  - 4. On new asphalt concrete surfacing until the surfacing has been opened to public traffic for a period of not less than 14 days.

### 3.10 Adjust Manholes and traffic boxes

- A. Adjust manhole frames and covers, traffic boxes for water valves, sewer cleanouts, and survey monuments to match new grade. Secure in place with a concrete collar as shown in the Contract Drawings and described in these Specifications. Refer to Section 03 30 00 - Cast-In-Place Concrete.

### 3.11 STREET MAINTENANCE

- A. Until the permanent pavement is placed, the base rock or temporary asphaltic plant mix at the surface of the trench shall be maintained at all times at a grade level with the adjacent street. Continuous inspection and maintenance of the trench area will be required. Lights and barriers shall be maintained on all Work that is not safe for travel until such time as is made safe.

### 3.12 CONTRACTOR'S RESPONSIBILITY

- A. Settlement of replaced pavement over trenches within the 12-month warranty period shall be considered the result of improper or inadequate compaction of the subbase or base materials. The Contractor shall promptly repair all pavement deficiencies noted during the warranty period.

END OF SECTION

## SECTION 32 31 13

### CHAIN LINK FENCES AND GATES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Fence framework, fabric, and accessories.
  2. Excavation for post bases.
  3. Concrete foundation for posts.
  4. Manual gates and related hardware.

##### 1.2 REFERENCES

- A. ASTM International:
1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  3. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
  4. A1011/A1011M-07 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  5. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
  6. ASTM F552 - Standard Terminology relating to Chain Link Fencing.
  7. ASTM F567 - Standard Practice for Installation of Chain-Link Fence.
  8. ASTM F626 - Standard Specification for Fence Fittings.
  9. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
  10. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
  11. ASTM F1184 - Standard Specification for Industrial and Commercial Horizontal Slide Gates.
- B. Chain Link Fence Manufacturers Institute:
1. CLFMI - Product Manual.

##### 1.3 SYSTEM DESCRIPTION

- A. Fence Height: 8 or 10 feet nominal as indicated on Drawings.
- B. Line Post Spacing: At intervals not exceeding 8 feet.
- C. Fence Post and Rail Strength: Conform to ASTM F1043 Heavy Industrial Fence quality.

#### 1.4 DESIGN REQUIREMENTS

- A. Design wind loads:
  - 1. Wind speed;  $V = 170$  mph.
  - 2. Exposure; D.
  - 3. Importance Factors;  $I = 1.5$ .

#### 1.5 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate plan layout, spacing and size of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
- C. Product Data: Submit data on fabric, posts, accessories, fittings and hardware.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines.
- C. Operation and Maintenance Data: Procedures for submittals.

#### 1.7 QUALITY ASSURANCE

- A. Supply material in accordance with CLFMI - Product Manual.
- B. Perform installation in accordance with ASTM F567.

#### 1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience.

#### 1.9 DELIVERY, STORAGE AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- C. Identify each package with manufacturer's name.
- D. Store fence fabric and accessories in secure and dry place.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Framing (Steel): ASTM F1083 Schedule 40 steel pipe, welded construction, minimum yield strength of 25 ksi; galvanized in accordance with ASTM F1043 and PVC/vinyl-coated black..
- B. Fabric Wire (Steel): ASTM A392 Class 2 zinc-coated steel wire, 9 gage, PVC/vinyl-coated black.
- C. Barbed Wire (Steel): ASTM A121 galvanized steel wire, 12 gage, two strands with four-point barbs at 3-inch spacing; PVC/vinyl-coated black.
- D. Concrete: Type specified in Section 03 30 00 – Cast-in-place Concrete.

### 2.2 COMPONENTS

- A. Line Posts: As specified on plans.
- B. Corner and Terminal Posts: As specified on plans.
- C. Gate Posts: As specified on plans.
- D. Top and Brace Rail: As specified on plans.
- E. Gate Frame: As specified on plans.
- F. Tension Wire: 6 gage thick steel, single strand, marcelled, spiraled or crimped, aluminum-coated tension wire conforming to ASTM A824.
- G. Tie Wire: Aluminum alloy steel wire.

### 2.3 ACCESSORIES

- A. Caps: Galvanized pressed steel; sized to post diameter, set screw retainer.
- B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; galvanized steel.
- C. Gate Hardware: Fork latch; 180 degree gate hinges for each leaf and hardware for padlock.
- D. Signage: Placards that inform the general public to keep out.

### 2.4 GATES

- A. General:
  - 1. Gate Types, Opening Widths and Directions of Operation: As indicated on Plans.
  - 2. Factory assembled gates.
  - 3. Design gates for operation by one person.

- B. Swing Gates:
  - 1. Fabricate gates to permit 180 degree swing.
  - 2. Gates Construction: ASTM F900 with welded corners. Use of corner fittings is not permitted.
  
- C. Sliding Gates:
  - 1. Framing and Posts: ASTM F1184, Class 2 for internal rollers.
  - 2. Rollers for cantilever sliding gates: Bearing type. Furnish non-sealed bearings with grease fitting for periodic maintenance.
  - 3. Secure rollers to post or frame without welding.
  
- D. Cantilever Sliding Gates:
  - 1. Fabricate gate leaf frames and tracks of aluminum conforming to ASTM B429/B429M alloy 6063-T6 or as required to meet performance requirements of ASTM F1184.
  - 2. Frame Members: Minimum 2 inches 0.91 lb/ft aluminum tubing welded assembly forming rigid, one piece unit.
  - 3. Install fabric securely stretched and held in center of tubing.
  - 4. Brace cantilever overhang frames with 3/8 inch brace rods. For gate leaf sizes greater than 23 feet, fabricate with additional lateral support rail welded adjacent to top and bottom horizontal rails.
  - 5. Provide minimum overhang for each leaf opening size as follows:

Opening	Overhang
Up to 10'-0"	6'-6"
10'-0" -14'-0"	7'-6"
14'-1" -22'-0"	10'-0"
22'-1" - 30'-0"	12'-0"

- 6. Track: Combined, integral track and rail.
- 7. Rail: Aluminum extrusion; minimum total weight of 3.72 lb/ft; designed to withstand reaction load of 2,000 lbs.
- 8. Roller Track Assembly: Two swivel type, zinc, die cast trucks having four, sealed lubricant ball bearing wheels minimum 2 inches diameter by 9/16 inches width designed for same reaction load as rail. Provide two side-rolling wheels for each gate leaf to maintain alignment of truck in track.
- 9. Fasten trucks to post brackets by minimum 7/8 inch diameter, 1/2 inch shank ball bolts.
- 10. Provide galvanized steel guide wheel assemblies consisting of two rubber wheels of minimum 4 inch diameter with oil-impregnated bearings for each supporting post.
- 11. Attach guide wheel assembly to post so bottom horizontal member rolls between wheels and permitting adjustment to maintain plumb gate frames and proper alignment.

## 2.5 FINISHES

- A. Components and Fabric: Galvanized to ASTM A123/A123M for components; ASTM A153/A153M for hardware; ASTM A392 for fabric; 2.0 oz/sq ft coating. Install black PVC/vinyl coating over all galvanized surfaces.
- B. Hardware: Galvanized to ASTM A153/A153M, 2.0 oz/sq ft coating. Install black PVC/vinyl coating.
- C. Accessories: Same finish as fabric.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install framework, fabric, accessories, and gates in accordance with ASTM F567.
- B. Set intermediate, terminal, and gate posts plumb, in concrete footings with top of footing 1 inch above finish grade. Slope top of concrete for water runoff.
- C. Line Post Footing Depth Below Finish Grade: As specified on plans.
- D. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: As specified on plans.
- E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.
- F. Install top rail through line post tops and splice with 6 inch long rail sleeves.
- G. Install center and bottom brace rail on corner gate leaves.
- H. Place fabric on outside of posts and rails.
- I. Do not stretch fabric until concrete foundation has cured 28 days.
- J. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- K. Position bottom of fabric 2 inches above finished grade.
- L. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- M. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- N. Install bottom tension wire or strap stretched taut between terminal posts.
- O. Support gates from gate posts. Do not attach hinged side of gate from building wall.

- P. Install gate with fabric to match fence. Install three hinges on each gate leaf, latch, and catches.
- Q. Install posts with 6 inches maximum clear opening from end posts to buildings, fences and other structures.
- R. Excavate holes for posts to diameter and spacing indicated on plans without disturbing underlying materials.
- S. Center and align posts. Place concrete around posts, and vibrate or tamp for consolidation. Verify vertical and top alignment of posts and make necessary corrections.
- T. Extend concrete footings 1 inch above grade, and trowel, forming crown to shed water.
- U. Allow footings to cure minimum 7 days before installing fabric and other materials attached to posts.

### 3.2 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation From Plumb: 1/4 inch.
- C. Maximum Offset From Indicated Position: 1 inch.
- D. Minimum distance from property line: 6 inches.

END OF SECTION

# **APPENDIX A OWNER-FURNISHED EQUIPMENT**

February 14, 2024

Prepared by

**Items #1-4 to be furnished by Owner.**  
**Item #5 to be provided by Contractor.**

Cordell Samai  
 (279) 444-2738  
 cordell.samai@cummins.com

We are pleased to provide you this quotation based on your inquiry.

Item	Description	Qty
1	C45N6, 45kW, 60Hz, Standby, Natural Gas/Propane Genset U.S. EPA, Stationary Emergency Application C45N6, 45kW, 60Hz, Standby, Natural Gas/Propane Genset Duty Rating - Standby Power (ESP) Emissions Certification - SI, EPA, Emergency, Stationary, 40CFR60 Listing - UL 2200 NFPA 110 Type 10 Level 1 Capable Cert - Seismic, IBC2000, IBC2003, IBC2006, IBC2009, IBC2011 Exciter/Regulator - Permanent Magnet Generator, 3 Phase Sensor Voltage - 120/240, 3 Phase, Delta, 4 Wire Alternator - 60Hz, 12L, 240/120V, 105C, 40C Ambient, Increased Motor Starting (IMS) Aluminum Sound Attenuated Level 2 Enclosure, with Exhaust System Enclosure Color - Green, Aluminum Enclosure - Wind Load 180 MPH, ASCE7-10 Larger Battery Rack Skidbase - Housing Ready Control Mounting - Left Facing PowerCommand 1.1 Controller Gauge - Oil Pressure Warning - Low Fuel Gas Pressure Stop Switch - Emergency Relays - Auxiliary, Qty 2, 25A - 15V DC/10A - 30V DC Control Display Language - English Load Connections - Dual Circuit Breaker, Location A, 70A - 250A, 3P, LSI, 600 Volts AC, 100%, UL Circuit Breaker, Location B, 150A, 3P, 600 Volts AC, 80%, UL Engine Governor - Electronic, Isochronous Single Gas Fuel - NG or LP Vapor Engine Starter - 12 Volt DC Motor Engine Air Cleaner - Normal Duty Battery Charging Alternator Battery Charger - 6 Amp, Regulated Engine Cooling - Radiator, High Ambient Air Temperature, Ship Fitted Shutdown - Low Coolant Level Extension - Coolant Drain Engine Coolant - 50% Antifreeze, 50% Water Mixture Coolant Heater Engine Oil Heater - 120 Volts AC, Single Phase Engine Oil Genset Warranty - 2 Years Base Literature - English Packing - Skid, Poly Bag Extension - Oil Drain Green Sound Level 2 Intake Baffle - Ship Loose	1
2	Battery Group 34	1
3	Sound Level2 Baffle, Shipped Loose	1
4	OTECB, OTEC Transfer Switch-Electronic Control: 150A, 3 poles, Nema 4X OTEC150, Transfer Switch, PowerCommand, 150 Amp Listing - UL 1008/CSA Certification IBC Seismic Certification Application - Utility to Genset Cabinet - Type 4x Stainless Poles - 3 (Solid Neutral) Frequency - 60 Hz System - 3 Phase, 3 or 4 Wire Voltage - 240 Volts AC	1

Item	Description	Qty
	Genset Starting Battery - 12V DC PC40 Control Auxiliary Relay - 12 Volts DC Coil - Installed Only Aux Relay - Emergency Position - 12 Volts DC Aux Relay - Normal Position - 12 Volts DC Interface - Communications Network, MODBUS RTU Module Control Panel, Security Key Cover Transfer Switch Warranty - 2 Year Comprehensive	
5	Service - start-up & testing: C45 N6 (45 KW) Propane gensets, OTEC ATS install battery, 2.0 Hrs. load bank test, 0.5 hrs. Bldg. load test, training.	1

**TOTAL: \$ 37,059.00**

Quote value does not include any tax.

EXCEPTIONS AND CLARIFICATIONS:

This quote is based on limited information and this package may or may not fit the owner's application. Any equipment or services not listed in this proposal are not included in this quote. Installation, offloading, concrete pad and fuel are by others. One stop freight included. A loading dock will be required at project site for offloading. The fuel type for this genset is LP vapor and not liquid propane. It is the purchaser's responsibility to verify emission compliance with the local air quality district before purchasing this genset. Load bank not included in this quote

NOTES:

**INTERNATIONAL BUILDING CODE (IBC) CERTIFICATION**

The products in this quotation identified as meeting the requirements of the 2009 IBC have been certified by their respective manufactures via a combination of analytical testing and shaker table testing. Not all products have been shaker table tested. OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT (OSHPD) OSHPD seismic requirements are continuing to evolve. Please contact Cummins for the most current requirements for meeting OSHPD applications.

**SELECTIVE COORDINATION FOR NATIONAL ELECTRIC CODE (NEC) ARTICLE 700 AND 701 LOADS**

Cummins generators are equipped with the manufacturer's recommended circuit breaker. Information regarding this device can be supplied upon request. This quotation is not valid if any changes to this circuit breaker(s) is required to coordinate with other devices in the electrical distribution system. If changes are required, the customer must provide a copy of the coordination study listing the manufacturers part number of the disconnect device to be supplied with the generator and a revised quotation will be issued.

**TRANSFER SWITCH WITHSTAND AND CLOSE RATINGS**

Transfer switch(es), if included in this quotation, require a withstand and closing rating (WCR) capable of meeting the available upstream fault current (kAIC). The WCR may be based on a specific breaker rating or a time-based rating, and it is the responsibility of a qualified facility designer or engineer to verify compatibility. In the event that the proposed transfer switch(es) are not compatible, the transfer switch(es) will need to be re-quoted to ensure compatibility. A full listing of the WCR can be provided upon request and will be included as part of the submittal package.

**CUMMINS STANDARD EXCLUSIONS**

**Exhaust System**

All off-engine piping, hangers, flanges, gaskets, bolts, insulation, other materials and labor to install.

**Fuel System**

All fuel piping and materials not limited to; supply, return, venting, valves, coolers, filters, pumps, fittings, primary fuel regulator, storage tank & senders, external to genset package. All fuel for testing and initial fill. Fuel tank vent extensions and flame arrestors unless specifically listed in the Bill of Materials.

**Cooling System**

Intake louvers, exhaust louvers, air dampers, sheet metal ducting, flex adapters, sound attenuators/baffles. All off engine piping, flexible connections, labor and coolant for remote cooling systems.

**Electrical**

All off-engine wiring, field terminations of wiring, and lugs other than those detailed in our submittal. Mounting Mounting bolts and anchors. Vibration isolators (if included) may be shipped loose for installation at the jobsite by others. Seismic engineering calculations.

**Electrical Testing**

Not limited to International Electrical Testing Association (NETA), infrared scanning, harmonic content or other independent agency testing of switchgear, switchboards, protective relays, circuit breaker, electrical coordination studies, arc flash studies and reactive load site testing.

Environmental Testing

Environmental Protection Agency (EPA), local air quality district or other Authority Having Jurisdiction (AHJ), including acoustical.

Programming

All protective relay settings, breaker settings, PLC programming or other user configurable device programming.

Documentation

Electronic submittals and operation and maintenance manuals will be provided. Printed copies are available upon request, additional charges may apply.

Miscellaneous

Site specific labeling. Exhaust backpressure, airflow restriction or vibration analysis

Design

Cummins is not responsible for system design or engineering and does not guarantee system performance standards. Cummins will supply documentation and reasonable assistance to others responsible for system engineering, design and performance.

Taxes and Permit

Any applicable sales tax, permits, fees, licenses.

Bonds

Any bid bond, payment or performance bond or other type of bond.

All items listed above are excluded and will only be supplied by Cummins if agreed upon, in writing, by a sales representative for Cummins.

LEAD TIME:

Lead Time for submittals

: Typical submittal lead time is 2-3 weeks after receipt of purchase order.

Lead Time for Equipment

: 34-35 weeks after submittal approval and release for production

Please feel free to contact me if you require any additional information; or if you have any further questions or concerns that I may be of assistance with.

Thank you for choosing Cummins.

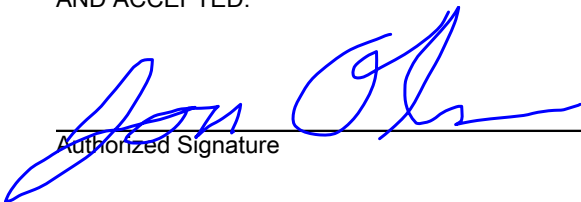
Submitted by:

Robert Robbins, Territory Manager - Power Generation

[robert.robbins@cummins.com](mailto:robert.robbins@cummins.com)

SUBMITTALS. An order for the equipment covered by this quotation will be accepted on a hold for release basis. Your order will not be released and scheduled for production until written approval to proceed is received in our office. Such submittal approval shall constitute acceptance of the terms and conditions of this quotation unless the parties otherwise agree in writing.

THERE ARE ADDITIONAL CONTRACT TERMS AND CONDITIONS ATTACHED TO THIS QUOTATION, INCLUDING LIMITATIONS OF WARRANTIES AND LIABILITIES, WHICH ARE EXPRESSLY INCORPORATED HEREIN. BY ACCEPTING THIS QUOTATION, CUSTOMER ACKNOWLEDGES THAT THE CONTRACT TERMS AND CONDITIONS HAVE BEEN READ, FULLY UNDERSTOOD AND ACCEPTED.



Authorized Signature

2/20/2024

Date



County of Del Norte, CSA No. 1.  
Company Name

Jonathan Olson, County Engineer  
Printed Name & Title

\_\_\_\_\_  
Purchase Order No

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## TERMS AND CONDITIONS FOR SALE OF POWER GENERATION EQUIPMENT

These Terms and Conditions for Sale of Power Generation Equipment, together with the quote ("Quote"), sales order ("Sales Order"), and/or credit application ("Credit Application") on the front side or attached hereto, are hereinafter collectively referred to as this "Agreement" and shall constitute the entire agreement between the customer identified in the Quote ("Customer") and Cummins Inc. ("Cummins") and supersede any previous representation, statements, agreements or understanding (oral or written) between the parties with respect to the subject matter of this Agreement. Customer shall be deemed to have made an unqualified acceptance of these Terms and Conditions and it shall become a binding agreement between the parties on the earliest of the following to occur: (i) Cummins' receipt of Customer's purchase order or purchase order number; (ii) Customer's signing or acknowledgment of this Agreement; (iii) Cummins' release of equipment to production pursuant to Customer's oral or written instruction or direction; (iv) Customer's payment of any amounts due to Cummins; or (v) any other event constituting acceptance under applicable law. No prior inconsistent course of dealing, course of performance, or usage of trade, if any, constitutes a waiver of, or serves to explain or interpret, the Terms and Conditions set forth in this Agreement. Electronic transactions between Customer and Cummins will be solely governed by the Terms and Conditions of this Agreement, and any terms and conditions on Customer's website or other internet site will be null and void and of no legal effect on Cummins. In the event Customer delivers, references, incorporates by reference, or produces any purchase order or document, specifications, terms, document, agreement (whether upstream or otherwise), or any other terms and conditions related thereto, then such specifications, terms, document, or other agreement: (i) shall be null and void and of no legal effect on Cummins, and (ii) this Agreement shall remain the governing terms of the transaction.

**1. SCOPE.** Cummins shall supply power generation equipment and any related parts, materials and/or services expressly identified in this Agreement (collectively, "Equipment"). No additional services, parts or materials are included in this Agreement unless mutually agreed upon by the parties in writing. A Sales Order for Equipment is accepted on a hold for release basis. The Sales Order will not be released and scheduled for production until written approval to proceed is received from Customer. A Quote is limited to the plans and specifications section specifically referenced in the Quote. No other sections shall apply. Additional requirements for administrative items may require additional costs. The Quote does not include off unit wiring, off unit plumbing, offloading, rigging, installation, exhaust insulation or fuel, unless otherwise stated and mutually agreed to in writing by the parties. Unless otherwise agreed by Cummins in writing, this Quote is valid for a maximum period of thirty (30) days from the date appearing on the first page of this Quote ("Quote Validation Period"). At the end of the Quote Validation Period, this Quote will automatically expire unless accepted by Customer prior to the end of the Quote Validation Period. The foregoing notwithstanding, in no event shall this Quote Validation Period be deemed or otherwise considered to be a firm offer period nor to establish an option contract, and Cummins hereby reserves its right to revoke or amend this Quote at any time prior to Customer's acceptance.

**2. SHIPPING; DELIVERY; DELAYS.** Unless otherwise agreed in writing by the parties, Equipment shall be delivered FOB origin, freight prepaid to first destination. For consumer and mobile products, freight will be charged to Customer. Unless otherwise agreed to in writing by the parties, packaging method, shipping documents and manner, route and carrier and delivery shall be as Cummins deems appropriate. Cummins may deliver in installments. A reasonable storage fee, as determined in Cummins' sole discretion, may be assessed if delivery of the Equipment is delayed, deferred, or refused by Customer. In the event Customer fails to take any or all shipments of Equipment ordered hereunder within thirty (30) days of the agreed upon delivery date, Cummins shall have the right, in its sole discretion to either (i) charge a minimum storage fee in the amount of one and one-half percent (1.5%) per month of the total quoted amount; or (ii) consider the Equipment abandoned and, subject to local laws, may (a) make the Equipment available for auction or sale to other customers or the public, or (b) otherwise use, destroy, or recycle the Equipment at Customer's sole cost and expense. The foregoing remedies shall be without prejudice to Cummins' right to pursue other remedies available under the law, including without limitation, recovery of costs and/or losses incurred due to the storage, auction, sale, destruction, recycling, or otherwise of the Equipment. Offloading, handling, and placement of Equipment and crane services are the responsibility of Customer and not included unless otherwise stated. All shipments are made within normal business hours, Monday through Friday. Any delivery, shipping, installation, or performance dates indicated in this Agreement are estimated and not guaranteed. Further, delivery time is subject to confirmation at time of order and will be in effect after engineering drawings have been approved for production. Cummins shall use commercially reasonable efforts to meet estimated dates, but shall not be liable to customer or any third party for any delay in delivery, shipping, installation, or performance, however occasioned, including any delays in performance that result directly or indirectly from acts of Customer or any unforeseen event, circumstance, or condition beyond Cummins' reasonable control including, but not limited to, acts of God, actions by any government authority, civil strife, fires, floods, windstorms, explosions, riots, natural disasters, embargos, wars, strikes or other labor disturbances, civil commotion, terrorism, sabotage, late delivery by Cummins' suppliers, fuel or other energy shortages, or an inability to obtain necessary labor, materials, supplies, equipment or manufacturing facilities. *AS A RESULT OF COVID-19 RELATED EFFECTS OR INDUSTRY SUPPLY CHAIN DISRUPTIONS, TEMPORARY DELAYS IN DELIVERY, LABOR OR SERVICES FROM CUMMINS AND ITS SUB-SUPPLIERS OR SUBCONTRACTORS MAY OCCUR. AMONG OTHER FACTORS, CUMMINS' DELIVERY OBLIGATIONS ARE SUBJECT TO CORRECT AND PUNCTUAL SUPPLY FROM OUR SUB-SUPPLIERS OR SUBCONTRACTORS, AND CUMMINS RESERVES THE RIGHT TO MAKE PARTIAL DELIVERIES OR MODIFY ITS LABOR OR SERVICE. WHILE CUMMINS SHALL MAKE COMMERCIALY REASONABLE EFFORTS TO MEET THE DELIVERY, SERVICE OR COMPLETION OBLIGATIONS SET FORTH HEREIN, SUCH DATES ARE SUBJECT TO CHANGE. IN THE EVENT DELIVERY, SHIPPING, INSTALLATION, OR PERFORMANCE IS DELAYED, HOWEVER OCCASSIONED, DUE TO EVENTS BEYOND CUMMINS' REASONABLE CONTROL, THEN THE DATE OF DELIVERY, SHIPPING, INSTALLATION, OR PERFORMANCE FOR THE EQUIPMENT OR SERVICES SHALL BE EQUITABLY EXTENDED FOR A PERIOD EQUAL TO THE TIME LOST, PLUS REASONABLE RAMP-UP.*

**3. PAYMENT TERMS; CREDIT; RETAINAGE.** Unless otherwise agreed to by the parties in writing and subject to credit approval by Cummins, payments are due thirty (30) days from the date of the invoice. If Customer does not have approved credit with Cummins,

as solely determined by Cummins, payments are due in advance or at the time of supply of the Equipment. If payment is not received when due, in addition to any rights Cummins may have at law, Cummins may charge Customer eighteen percent (18%) interest annually on late payments, or the maximum amount allowed by law. Customer agrees to pay Cummins' costs and expenses (including reasonable attorneys' fees) related to Cummins' enforcement and collection of unpaid invoices, or any other enforcement of this Agreement by Cummins. Retainage is not acceptable nor binding, unless required by statute or accepted and confirmed in writing by Cummins prior to shipment. If Customer fails to make any payments to Cummins when due and payable, and such failure continues for more than sixty (60) days from the date of the invoice, or less if required by applicable law, then Cummins may, at Cummins' sole discretion and without prejudice to any other rights or remedies, either (i) terminate this Agreement; or (ii) postpone delivery of any undelivered Equipment in Cummins' possession and/or suspend its services until payment for unpaid invoices is received.

**4. TAXES; EXEMPTIONS.** Unless otherwise stated, the Quote excludes all applicable local, state and federal sales and/or use taxes, permits and licensing. Customer must provide a valid resale or exemption certificate prior to shipment of Equipment or applicable taxes will be added to the invoice.

**5. TITLE; RISK OF LOSS.** Unless otherwise agreed in writing by the parties, title and risk of loss for the Equipment shall pass to Customer upon delivery of the Equipment by Cummins to freight carrier or to Customer at pickup at Cummins' facility.

**6. INSPECTION AND ACCEPTANCE.** Customer shall inspect the Equipment upon delivery, before offloading, for damage, defects, and shortage. Any and all claims which could have been discovered by such inspection shall be deemed absolutely and unconditionally waived unless noted by Customer on the bill of lading. Where Equipment is alleged to be non-conforming or defective, written notice of defect must be given to Cummins within three (3) days from date of delivery after which time Equipment shall be deemed accepted. Cummins shall have a commercially reasonable period of time in which to correct such non-conformity or defect. If non-conformity or defect is not eliminated to Customer's reasonable satisfaction, Customer may reject the Equipment (but shall protect the Equipment until returned to Cummins) or allow Cummins another opportunity to undertake corrective action. In the event startup of the Equipment is included in the services, acceptance shall be deemed to have occurred upon successful startup.

**7. LIEN; SECURITY AGREEMENT.** Customer agrees that Cummins retains all statutory lien rights. To secure payment, Customer grants Cummins a Purchase Money Security Interest in the Equipment. If any portion of the balance is due to be paid following delivery, Customer agrees to execute and deliver such security agreement, financing statements, deed of trust and such other documents as Cummins may request from time to time in order to permit Cummins to obtain and maintain a perfected security interest in the Equipment; or in the alternative, Customer grants Cummins a power of attorney to execute and file all financing statements and other documents needed to perfect this security interest. Cummins may record this Agreement, bearing Customer's signature, or copy of this Agreement in lieu of a UCC-1, provided that it shall not constitute an admission by Cummins of the applicability or non-applicability of the UCC nor shall the failure to file this form or a UCC-1 in any way affect, alter, or invalidate any term, provision, obligation or liability under this Agreement. The security interest shall be superseded if Customer and Cummins enter into a separate security agreement for the Equipment. Prior to full payment of the balance due, Equipment will be kept at Customer's location noted in this Agreement, will not be moved without prior notice to Cummins, and is subject to inspection by Cummins at all reasonable times.

05.01.2023

**8. CANCELLATION; CHARGES.** Orders placed with and accepted by Cummins may not be cancelled except with Cummins' prior written consent. If Customer seeks to cancel all or a portion of an order placed pursuant to this Agreement, and Cummins accepts such cancellation in whole or in part, Customer shall be assessed cancellation charges as follows: (i) 10% of total order price if cancellation is received in Cummins' office after Cummins has provided submittals and prior to releasing equipment to be manufactured; (ii) 25% of total order price if cancellation is received in Cummins' office after receipt of submittal release to order, receipt of a purchase order for a generator already on order with the factory, or is asked to make any hardware changes to the equipment already on order with the factory; (iii) 50% of total order price if cancellation is received in Cummins' office sixty (60) or fewer days before the scheduled shipping date on the order; or (iv) 100% of total order price if cancellation is received in Cummins' office after the equipment has shipped from the manufacturing plant.

**9. TERMINATION.** Cummins may, at any time, terminate this Agreement for convenience upon sixty (60) days' written notice to Customer. If the Customer defaults by (i) breaching any term of this Agreement, (ii) becoming insolvent or declared bankrupt, or (iii) making an assignment for the benefit of creditors, Cummins may, upon written notice to Customer, immediately terminate this Agreement. Upon such termination for default, Cummins shall immediately cease any further performance under this Agreement, without further obligation or liability to Customer, and Customer shall pay Cummins for any Equipment or services supplied under this Agreement, in accordance with the payment terms detailed in Section 3. If a notice of termination for default has been issued and is later determined, for any reason, that the Customer was not in default, the rights and obligations of the parties shall treat the termination as a termination for convenience.

**10. MANUALS.** Unless otherwise stated, electronic submittals and electronic operation and maintenance manuals will be provided, and print copies may be available upon Customer's request at an additional cost.

**11. TRAINING; START UP SERVICES; INSTALLATION.** Startup services, load bank testing, and owner training are not provided unless otherwise stated. Site startup will be subject to the account being current and will be performed during regular Cummins business hours, Monday to Friday. Additional charges may be added for work requested to be done outside standard business hours, on weekends, or holidays. One visit is allowed unless specified otherwise in the Quote. A minimum of two-week prior notice is required to schedule site startups and will be subject to prior commitments and equipment and travel availability. A signed site check sheet confirming readiness will be required, and Cummins personnel may perform an installation audit prior to the startup being completed. Any issues identified by the installation audit shall be corrected at the Customer's expense prior to the start-up. Portable load banks

for site test (if offered in the Quote) are equipped with only 100 feet of cable. Additional lengths may be arranged at an extra cost. Cummins is not responsible for any labor or materials charged by others associated with start-up and installation of Equipment, unless previously agreed upon in writing. Supply of fuel for start-up and/or testing, fill-up of tank after start up, or change of oil is not included unless specified in the Quote. All installation/execution work at the site including, but not limited to: civil, mechanical, electrical, supply of wall thimbles, exhaust extension pipe, elbows, hangers, expansion joints, insulation and cladding materials, fuel/oil/cooling system piping, air ducts, and louvers/dampers is not included unless specified in the Quote. When an enclosure or sub-base fuel tank (or both) are supplied, the openings provided for power cable and fuel piping entries, commonly referred to as “stub-ups”, must be sealed at the site by others before commissioning. All applications, inspections and/or approvals by authorities are to be arranged by Customer.

**12. MANUFACTURER’S WARRANTY.** Equipment purchased hereunder is accompanied by an express written manufacturer’s warranty (“Warranty”) and, except as expressly provided in this Agreement, is the only warranty offered on the Equipment. A copy of the Warranty is available upon request. While this Agreement and the Warranty are intended to be read and applied in conjunction, where this Agreement and the Warranty conflict, the terms of the Warranty shall prevail.

**13. WARRANTY PROCEDURE.** Prior to the expiration of the Warranty, Customer must give notice of a warrantable failure to Cummins and deliver the defective Equipment to a Cummins location or other location authorized and designated by Cummins to make the repairs during regular business hours. Cummins shall not be liable for towing charges, maintenance items such as oil filters, belts, hoses, etc., communication expenses, meals, lodging, and incidental expenses incurred by Customer or employees of Customer, “downtime” expenses, overtime expenses, cargo damages and any business costs and losses of revenue resulting from a warrantable failure.

**14. LIMITATIONS ON WARRANTIES.**

**THE REMEDIES PROVIDED IN THE WARRANTY AND THIS AGREEMENT ARE THE SOLE AND EXCLUSIVE WARRANTIES AND REMEDIES PROVIDED BY CUMMINS TO THE CUSTOMER UNDER THIS AGREEMENT. EXCEPT AS SET OUT IN THE WARRANTY AND THIS AGREEMENT, AND TO THE EXTENT PERMITTED BY LAW, CUMMINS EXPRESSLY DISCLAIMS ALL OTHER REPRESENTATIONS, WARRANTIES, ENDORSEMENTS, AND CONDITIONS OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY STATUTORY OR COMMON LAW IMPLIED REPRESENTATIONS, WARRANTIES AND CONDITIONS OF FITNESS FOR A PURPOSE OR MERCHANTABILITY.**

The limited warranty does not cover Equipment failures resulting from: (a) inappropriate use relative to designated power rating; (b) inappropriate use relative to application guidelines; (c) inappropriate use of an EPA-SE application generator set relative to EPA’s standards; (d) normal wear and tear; (e) improper and/or unauthorized installation; (f) negligence, accidents, or misuse; (g) lack of maintenance or unauthorized or improper repair; (h) noncompliance with any Cummins published guideline or policy; (i) use of improper or contaminated fuels, coolants, or lubricants; (j) improper storage before and after commissioning; (k) owner’s delay in making Equipment available after notification of potential Equipment problem; (l) replacement parts and accessories not authorized by Cummins; (m) use of battle short mode; (n) owner or operator abuse or neglect such as: operation without adequate coolant, fuel, or lubricants; over fueling; over speeding; lack of maintenance to lubricating, fueling, cooling, or air intake systems; late servicing and maintenance; improper storage, starting, warm-up, running, or shutdown practices, or for progressive damage resulting from a defective shutdown or warning device; or (o) damage to parts, fixtures, housings, attachments and accessory items that are not part of the generating set.

**15. INDEMNITY.** Customer shall indemnify, defend and hold harmless Cummins from and against any and all claims, actions, costs, expenses, damages and liabilities, including reasonable attorneys’ fees, brought against or incurred by Cummins related to or arising out of this Agreement or the Equipment supplied under this Agreement (collectively, the “Claims”), where such Claims were caused or contributed to by, in whole or in part, the acts, omissions, fault or negligence of the Customer. Customer shall present any Claims covered by this indemnity to its insurance carrier unless Cummins directs that the defense will be handled by Cummins’ legal counsel at Customer’s expense.

**16. LIMITATION OF LIABILITY**

**NOTWITHSTANDING ANY OTHER TERM OF THIS AGREEMENT, IN NO EVENT SHALL CUMMINS, ITS OFFICERS, DIRECTORS, EMPLOYEES, OR AGENTS BE LIABLE TO CUSTOMER OR ANY THIRD PARTY, WHETHER IN CONTRACT OR IN TORT OR UNDER ANY OTHER LEGAL THEORY (INCLUDING, WITHOUT LIMITATION, STRICT LIABILITY OR NEGLIGENCE), FOR ANY INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL DAMAGES OF ANY KIND (INCLUDING WITHOUT LIMITATION DOWNTIME, LOSS OF PROFIT OR REVENUE, LOSS OF DATA, LOSS OF OPPORTUNITY, DAMAGE TO GOODWILL, ENHANCED DAMAGES, MONETARY REQUESTS RELATING TO RECALL EXPENSES AND REPAIRS TO PROPERTY, AND/OR DAMAGES CAUSED BY DELAY), OR IN ANY WAY RELATED TO OR ARISING FROM CUMMINS’ SUPPLY OF EQUIPMENT UNDER THIS AGREEMENT OR THE USE OR PERFORMANCE OF EQUIPMENT SUPPLIED UNDER THIS AGREEMENT. IN NO EVENT SHALL CUMMINS’ LIABILITY TO CUSTOMER OR ANY THIRD PARTY CLAIMING DIRECTLY THROUGH CUSTOMER OR ON CUSTOMER’S BEHALF UNDER THIS AGREEMENT EXCEED THE TOTAL COST OF EQUIPMENT SUPPLIED BY CUMMINS UNDER THIS AGREEMENT GIVING RISE TO THE CLAIM. BY ACCEPTANCE OF THIS AGREEMENT, CUSTOMER ACKNOWLEDGES CUSTOMER’S SOLE REMEDY AGAINST CUMMINS FOR ANY LOSS SHALL BE THE REMEDY PROVIDED HEREIN.**

**17. DEFAULT; REMEDIES.** Customer shall be in breach and default if: (a) any of the payments or amounts due under this Agreement are not paid; (b) Customer fails to comply, perform, or makes any misrepresentation relating to any of the Customer’s obligations or covenants under this Agreement; or (c) prior to full payment of the balance due, Customer ceases to do business, becomes insolvent, makes an assignment for the benefit of its creditors, appoints a receiver, commences an action for dissolution or liquidation, or

becomes subject to bankruptcy proceedings, or the Equipment is attached, levied upon, seized under legal process, is subjected to a lien or encumbrance, or transferred by operation of law or otherwise to anyone other than Cummins. Upon the occurrence of any event of Customer's default, Cummins, at its sole option and without notice, shall have the right to exercise concurrently or separately any one or all of the following remedies, which shall be cumulative and not alternative: (a) to declare all sums due, and to become due, under this Agreement immediately due and payable; (b) to commence legal proceedings, including collection actions and specific performance proceedings, to enforce performance by Customer of any and all provisions of this Agreement, and to be awarded damages or injunctive relief for the Customer's breach; (c) to require the Customer to deliver the Equipment to Cummins' branch specified on the face of this Agreement; (d) to exercise one or more of the rights and remedies available to a secured party under applicable law; and (e) to enter, without notice or liability or legal process, onto any premises where the Equipment may be located, using force permitted by law, and there to disconnect, remove and repossess the Equipment, the Customer having waived further right to possession after default. A waiver of any event of default by Cummins shall not be a waiver as to any other or subsequent default.

**18. CUSTOMER REPRESENTATIONS; RELIANCE.** Customer is responsible for obtaining, at its cost, permits, import licenses, and other consents in relation to the Equipment, and if requested by Cummins, Customer shall make these permits, licenses, and consents available to Cummins prior to shipment. Customer represents that it is familiar with the Equipment and understands operating instructions and agrees to perform routine maintenance services. Until the balance is paid in full, Customer shall care for the Equipment properly, maintain it in good operating condition, repair and appearance; and Customer shall use it safely and within its rated capacity and only for purpose it was designed. Even if Customer's purchase of Equipment from Cummins under this Agreement is based, in whole or in part, on specifications, technical information, drawings, or written or verbal advice of any type from third parties, Customer has sole responsibility for the accuracy, correctness and completeness of such specifications, technical information, drawings, or advice. Cummins make no warranties or representations respecting the accuracy, correctness and completeness of any specifications, technical information, drawings, advice or other information provided by Cummins. Cummins makes no warranties or representations respecting the suitability, fitness for intended use, compatibility, integration or installation of any Equipment supplied under this Agreement. Customer has sole responsibility for intended use, for installation and design and performance where it is part of a power, propulsion, or other system. Limitation of warranties and remedies and all disclaimers apply to all such technical information, drawings, or advice. Customer acknowledges and agrees by accepting delivery of the Equipment that the Equipment purchased is of the size, design, capacity and manufacture selected by the Customer, and that Customer has relied solely on its own judgment in selecting the Equipment.

**19. CONFIDENTIALITY.** Each party shall keep confidential any information received from the other that is not generally known to the public and at the time of disclosure, would reasonably be understood by the receiving party to be proprietary or confidential, whether disclosed in oral, written, visual, electronic, or other form, and which the receiving party (or agents) learns in connection with this Agreement including, but not limited to: (a) business plans, strategies, sales, projects and analyses; (b) financial information, pricing, and fee structures; (c) business processes, methods, and models; (d) employee and supplier information; (e) specifications; and (f) the terms and conditions of this Agreement. Each party shall take necessary steps to ensure compliance with this provision by its employees and agents.

**20. GOVERNING LAW AND JURISDICTION.** This Agreement and all matters arising hereunder shall be governed by, interpreted, and construed in accordance with the laws of the State of Indiana without giving effect to any choice or conflict of law provision. The parties agree that the federal and state courts of the State of Indiana shall have exclusive jurisdiction to settle any dispute or claim arising in connection with this Agreement or any related matter, and hereby waive any right to claim such forum would be inappropriate, including concepts of forum non conveniens.

**21. INSURANCE.** Upon Customer's request, Cummins will provide to Customer a Certificate of Insurance evidencing Cummins' relevant insurance coverage.

**22. ASSIGNMENT.** This Agreement shall be binding on the parties and their successors and assigns. Customer shall not assign this Agreement without the prior written consent of Cummins.

**23. INTELLECTUAL PROPERTY.** Any intellectual property rights created by either party, whether independently or jointly, in the course of the performance of this Agreement or otherwise related to Cummins pre-existing intellectual property or subject matter related thereto, shall be Cummins' property. Customer agrees to assign, and does hereby assign, all right, title, and interest to such intellectual property to Cummins. Any Cummins pre-existing intellectual property shall remain Cummins' property. Nothing in this Agreement shall be deemed to have given Customer a license or any other rights to use any of the intellectual property rights of Cummins.

**24. PRICING.** To the extent allowed by law, actual prices invoiced to Customer may vary from the price quoted at the time of order placement, as the same will be adjusted for prices prevailing on the date of shipment due to economic and market conditions at the time of shipment. Subject to local laws, Cummins reserves the right to adjust pricing on goods and services due to input and labor cost changes and/or other unforeseen circumstances beyond Cummins' control.

**25. MISCELLANEOUS.** Cummins shall be an independent contractor under this Agreement. All notices under this Agreement shall be in writing and be delivered personally, mailed via first class certified or registered mail, or sent by a nationally recognized express courier service to the addresses set forth in this Agreement. No amendment of this Agreement shall be valid unless it is in writing and signed by an authorized representative of the parties hereto. Failure of either party to require performance by the other party of any provision hereof shall in no way affect the right to require such performance at any time thereafter, nor shall the waiver by a party of a breach of any of the provisions hereof constitute a waiver of any succeeding breach. Any provision of this Agreement that is invalid or unenforceable shall not affect the validity or enforceability of the remaining terms hereof. These terms are exclusive and constitute the entire agreement. Customer acknowledges that the provisions were freely negotiated and bargained for, and

Customer has agreed to purchase of the Equipment pursuant to these Terms and Conditions. Acceptance of this Agreement is expressly conditioned on Customer's assent to all such Terms and Conditions. Neither party has relied on any statement, representation, agreement, understanding, or promise made by the other except as expressly set out in this Agreement. In the event Cummins incurs additional charges hereunder due to the acts or omissions of Customer, the additional charges will be passed on to the Customer, as applicable. Headings or other subdivisions of this Agreement are inserted for convenience of reference and shall not limit or affect the legal construction of any provision hereof. The Parties' rights, remedies, and obligations under this Agreement which by their nature are intended to continue beyond the termination or cancellation of this Agreement, including but not limited to the Section 16. Limitation of Liability provision contained herein, shall survive the expiration, termination, or cancellation of this Agreement.

**26. COMPLIANCE.** Customer shall comply with all laws applicable to its activities under this Agreement, including, without limitation, any and all applicable federal, state, and local anti-bribery, environmental, health, and safety laws and regulations then in effect. Customer acknowledges that the Equipment, and any related technology that are sold or otherwise provided hereunder may be subject to export and other trade controls restricting the sale, export, re-export and/or transfer, directly or indirectly, of such Equipment or technology to certain countries or parties, including, but not limited to, licensing requirements under applicable laws and regulations of the United States, the United Kingdom and other jurisdictions. It is the intention of Cummins to comply with these laws, rules, and regulations. Any other provision of this Agreement to the contrary notwithstanding, Customer shall comply with all such applicable all laws relating to the cross-border movement of goods or technology, and all related orders in effect from time to time, and equivalent measures. Customer shall act as the importer of record with respect to the Equipment and shall not resell, export, re-export, distribute, transfer, or dispose of the Equipment or related technology, directly or indirectly, without first obtaining all necessary written permits, consents, and authorizations and completing such formalities as may be required under such laws, rules, and regulations. In addition, Cummins has in place policies not to distribute its products for use in certain countries based on applicable laws and regulations including but not limited to UN, U.S., UK, and European Union regulations. Customer undertakes to perform its obligations under this Agreement with due regard to these policies. Strict compliance with this provision and all laws of the territory pertaining to the importation, distribution, sales, promotion and marketing of the Equipment is a material consideration for Cummins entering into this Agreement with Customer and continuing this Agreement for its term. Customer represents and warrants that it has not and shall not, directly or through any intermediary, pay, give, promise to give or offer to give anything of value to a government official or representative, a political party official, a candidate for political office, an officer or employee of a public international organization or any other person, individual or entity at the suggestion, request or direction or for the benefit of any of the above-described persons and entities for the purposes of inducing such person to use his influence to assist Cummins in obtaining or retaining business or to benefit Cummins or any other person in any way, and will not otherwise breach any applicable laws relating to anti-bribery. Any failure by Customer to comply with these provisions will constitute a default giving Cummins the right to immediate termination of this Agreement and/or the right to elect not to recognize the warranties associated with the Equipment. Customer shall accept full responsibility for any and all civil or criminal liabilities and costs arising from any breaches of those laws and regulations and will defend, indemnify, and hold Cummins harmless from and against any and all fines, penalties, claim, damages, liabilities, judgments, costs, fees, and expenses incurred by Cummins or its affiliates as a result of Customer's breach.

**27. To the extent applicable, this contractor and subcontractor shall abide by the requirements of 41 CFR §§ 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities and prohibit discrimination against all individuals based on their race, color, religion, sex, sexual orientation, gender identity or national origin. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, protected veteran status or disability. The employee notice requirements set forth in 29 CFR Part 471, Appendix A to Subpart A, are hereby incorporated by reference into this contract.**