COUNTY OF TULARE

STATE OF CALIFORNIA

BID DOCUMENTS AND SPECIFICATIONS

FOR CONSTRUCTION OF

CNG FUELING SYSTEM AT THE TULARE COUNTY TRANSIT OPERATIONS AND MAINTENANCE FACILITY

FUNDED BY:

FHWA Congestion Mitigation and Air Quality Improvement Program Grant
Tulare County Measure R Funds

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COUNTY OF TULARE

STATE OF CALIFORNIA

SPECIFICATIONS, PROPOSAL AND CONTRACT

FOR CONSTRUCTION OF

CNG FUELING SYSTEM AT THE TULARE COUNTY TRANSIT OPERATIONS AND MAINTENANCE FACILITY

FUNDED BY:

FHWA Congestion Mitigation and Air Quality Improvement Program Grant
Tulare County Measure R Funds

APPROVED: _____ DATE: 1-15-19
Kuyler Crocker, Chairman
County of Tulare Board of Supervisors

APPROVED: _____ DATE: 1/7/19
Reed Schenke, P.E.
RMA Director

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SECTION 000005: TABLE OF CONTENTS

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ADVERTISEMENT FOR BIDS
TULARE COUNTY
CNG FUELING SYSTEM AT THE TULARE COUNTY TRANSIT OPERATIONS AND MAINTENANCE FACILITY
14001 Avenue 256 Visalia, CA 93292

NOTICE IS HEREBY GIVEN that individually sealed bids for the **CNG Fueling System at the Tulare County Transit Operations and Maintenance Facility Project, 14001 Avenue 256 Visalia, CA 93292** will be accepted by the Clerk of the Board of Supervisors, County of Tulare, Administration Building, 2800 W. Burrel Avenue, Visalia, California until **3:00 p.m.** on **Thursday, March 21, 2019.**

Project Description: This new facility will be constructed on the site of the Transit Operations and Maintenance Facility (TOMF) which is located adjacent to the existing County of Tulare's Road Yard near the intersection of Avenue 256 and Road 140 Visalia, CA. The CNG Fueling System is to be constructed on an undisturbed area of the TOMF site that is unpaved and designated as a space for bus fueling and parking. The project consists of construction of a CNG fueling system complete with compressor, dryer and dispensers, asphalt paving, parking lot striping and installation of electrical panels.

An optional pre-bid conference will be held at the **Tulare County Resource Management Agency Main Conference Room, 5961 S. Mooney Blvd. Ave Visalia, CA 93277** at **10:00 a.m.** on **Thursday, March 7, 2019.** The pre-bid conference is optional; Bidders that attend shall sign the pre-bid conference attendance roster.

Plans, specifications, and proposal forms for bidding this project can only be obtained at the Resource Management Agency – Permit Center, 5961 South Mooney Boulevard, Visalia, CA 93277; Telephone (559) 624-7000; Office Hours 9:00 AM – 4:30 PM Mon-Thurs; 9:00 AM – 11:00 AM Fri. There is a non-refundable fee of $20.00 per set for the documents. When obtaining the documents verify the name of the project as several projects could be open at the same time. An unofficial set of Plans, Specifications, and other project information is available for download at the County's website under the Request for Bid Proposals for Construction Services heading at the following address:

https://tularecounty.ca.gov/rma/index.cfm/rma-at-work/

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

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

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

TIME OF COMPLETION: The Project is to be completed within **240** calendar days from the date to be established in the "NOTICE TO PROCEED".

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

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

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

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

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

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

- No contractor or subcontractor may be listed on this or any other bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].
- No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
- This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

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

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

Contractor shall also comply with the following federal contract requirements, the provisions of which are incorporated herein by this reference: Buy American Preference, Foreign Trade Restriction, Davis Bacon Act, Affirmative Action, Government-wide Debarment and Suspension, and the Government-wide Requirements for Drug Free Workplace.

After the time set for opening of bids, no bid may be withdrawn for a period of ninety (90) days.

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

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

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

Date_____

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

Jason Britt
County Administrative Officer/Clerk
Board of Supervisors
County of Tulare

By_____
CAO

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END OF SECTION 00020

SECTION 000100 - INSTRUCTIONS TO BIDDERS

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

DOCUMENTS:

Plans, specifications, and proposal forms for bidding this project can only be obtained at the Tulare County Resource Management Agency – Permit Center, 5961 South Mooney Boulevard, Visalia, CA 93277; Telephone (559) 624-7000; Office Hours 9:00 AM – 4:30 PM Mon-Thurs; 9:00 AM – 11:00 AM Fri. There is a non-refundable fee of $20.00 per set for the documents. When obtaining the documents verify the name of the project as several projects could be open at the same time. An unofficial set of Plans, Specifications, and other project information is available for download at the County's website under the Request for Bid Proposals for Construction Services heading at the following address at the following address:

https://tularecounty.ca.gov/rma/index.cfm/rma-at-work/

EXAMINATION:

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

A non-mandatory pre-bid conference will be held at **10:00 a.m. on Thursday March 7, 2019** at the **Tulare County Resource Management Agency Main Conference Room, 5961 S. Mooney Blvd. Ave Visalia, CA** Bidders that attend the pre-bid conference will sign the pre-bid conference attendance roster.

INTERPRETATIONS, ADDENDA:

A. Should a bidder find discrepancies, inconsistencies or omissions from the Drawings, Specifications and Related Documents, or should a bidder be in doubt as to their meaning, they shall at once notify the County by email: rmiller@co.tulare.ca.us, or by mail attention Ross Milller Resource Management Agency 5961 South Mooney Boulevard, Visalia, CA 93277. Any e-mail sent to Mr. Miller should also be carbon copied to Alan Simpson Jr., asimpson@co.tulare.ca.us Any such item not brought to the County's attention by **3:00 p.m., Wednesday, March 13, 2019** shall be done in accordance with the County's interpretation for the good of the work in accordance with the intent and meaning of the Contract Documents. Neither County nor County's Representative will be responsible for oral instructions or information. Questions received by **3:00 p.m. on Wednesday, March 13, 2019** will be answered by a written Addendum directed to all bidders.

B. Any Addenda issued by the County or County's Representative during the time of bidding are to be considered in the Bid, and will become a part of the Agreement between Contractor and County. Bidders shall acknowledge receipt of all Addenda on the Bid Form in the space provided.

BUY AMERICA

The contractor is required to furnish steel and iron materials to be incorporated into the work with certificates of compliance. Steel and iron materials must be produced in the U.S. except:

1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials [60 Fed Reg 15478 (03/24/1995)];

2. If the total combined cost of the materials does not exceed the greater of 0.1 percent of the total bid or $2,500, materials produced outside the U.S. may be used.

Production includes:

1. Processing steel and iron materials, including smelting or other processes that alter the physical form or shape (such as rolling, extruding, machining, bending, grinding, and drilling) or chemical composition;

2. Coating application, including epoxy coating

QUALITY ASSURANCE:

The Agency uses a Quality Assurance Program (QAP) to ensure a material is produced to comply with the Contract. You may examine the records and reports of tests the Agency performs if they are available at the job site. Schedule work to allow time for QAP

SUBSTITUTION OF MATERIALS:

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

BIDS:

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

B. Bids shall be addressed and delivered to:

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

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

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

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

3. A completed, Non-Collusion Declaration referring to the Bid Package bid upon.

4. County reserves the right to deem the bid non-responsive for any information crossed out from the bid packet including information completed by the manufacturer.

D. All bids shall remain firm for a period of ninety (90) calendar days after the date of bid opening.

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

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

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

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

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

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

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

L. The following failures are not waiveable and will cause a bid to be considered nonresponsive:

1. Failure to sign the bid
2. Failure to furnish the required bid bond on the County form provided, or a cashier's check in an amount equal to 10% of the Bidder's base bid
3. Failure to include a total amount of the bid
4. Failure to submit a completed addenda certification statement
5. Failure to be named on the official County planholders list
6. Failure to submit and sign the required DBE documentation
   a. This documentation is either:
      i. <u>CASE 1: In the event that the contractor meets the specified project DBE participation goal (Specified in Section 000200):</u> A sole submission of a

completed Caltrans Exhibit 15-G with the following information listed in the correct fields on the form for each DBE Subcontractor:

- Bid Items (Work) to be performed
- Description of work, service or materials, supplied
- DBE Certification Number
- Dollar amount of work to be performed
- Total claimed DBE participation percentage (Percentage of total bid amount)
- Preparers signature (by individual authorized by business to execute contracts) and date signed, preparer's name, preparer's title, and a phone number at which the preparer can be reached

ii. CASE 2: In the event that the contractor does not meet the specified DBE participation goal (Specified in Section 000200): A completed Exhibit 15-G indicating the DBE contractors that are to be part of the project with the following information in the correct fields:

- Bid Items (Work) to be performed
- Description of work, service or materials, supplied
- DBE Certification Number
- Dollar amount of work to be performed
- Total claimed DBE participation percentage (Percentage of total bid amount)
- Preparers signature (by individual authorized by business to execute contracts) and date signed, preparer's name, preparer's title, and a phone number at which the preparer can be reached

In addition to the Exhibit 15-G and the information listed above, if the contractor does not meet the required DBE participation goal it will be necessary to submit Caltrans Exhibit 15-H listing the contractor's Good Faith Efforts to solicit DBE firms to work on the project.

7. Failure to submit a Certificate of Buy American Compliance or Type 4 Waiver
8. Failure to submit a completed Sub-Contractor's List Form that lists the contractor, work to be performed (by bid item and description), dollar amount of work to be performed, the contractor's address and relevant contact information and all other fields specified on the sub-contractors list form.

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

BID PROTESTS:

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

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

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

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

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

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

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

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

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

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

BID RIGGING:
The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., Eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected

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

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

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

CONTRACTOR'S INSURANCE:
Coverage: Contractor shall maintain, for the duration of the work and warranty period required under the Agreement, all Insurance in the minimum amounts required by the "GENERAL CONDITIONS."

Prior to approval of the Agreement by the COUNTY, Contractor shall file with the Clerk of the Board of Supervisors, evidence of the insurance in accordance with Article 11 of the General Conditions, which outlines the minimum scope, specifications and limits of insurance required under the Agreement. Additional insured endorsements required as outlined in Article 11 shall not be used to reduce limits available to County as an additional insured from the Contractor's full policy limits. Insurance policies shall not be used to limit liability or to limit the indemnification provisions and requirements of the Agreement or act in any way to reduce the policy coverage and limits available from the insurer (s). Failure to maintain or renew coverage, or to provide evidence of renewal, may be considered a material breach of the Agreement.

END OF SECTION 000100

SECTION 000200 DISADVANTAGED BUSINESS ENTERPRISE, FEMALE AND MINORITY GOALS AND PARTICIPATION

To ensure equal participation in the Project of Disadvantaged Business Enterprises ("DBEs") as provided in 49 CFR 26.5, the County shows a goal for DBEs.

Accordingly, Bidders shall (1) make work available to DBEs and select work parts consistent with available DBE subcontractors and suppliers; and (2) meet the DBE goal shown elsewhere in these special provisions or demonstrate that you made adequate good faith efforts to meet this goal.

It is your responsibility as a Bidder to verify that the DBE firm is certified as DBE at date of bid opening. For a list of DBEs certified by the California Unified Certification Program, go to:

http://www.dot.ca.gov/hq/bep/find_certified.htm

The DBE Participation Goal for this project is 32%.

The DBE firm must be certified for the type of work listed on Exhibit 15-G Local Agency Bidder Commitment (Construction Contracts). DBE firms shall be considered certified only for the work classification codes listed on their California Unified Certification Program (CUCP) certification or as shown on the Caltrans DBE website listed above. Only certifications for work classifications obtained prior to bid opening will count toward DBE commitment goals.

All DBE participation will count toward the California Department of Transportation's federally mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs counts towards the goal in the following manner:

1. **100 percent counts** if the materials or supplies are obtained from a DBE manufacturer.
2. **60 percent counts** if the materials or supplies are obtained from a DBE regular dealer.
3. **Only fees, commissions, and charges** for assistance in the procurement and delivery of materials or supplies count if obtained from a DBE that is neither a manufacturer, nor regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit towards the goal if you employ a DBE trucking company, certified with the proper work classification code prior to bid opening, that performs a commercially useful function as defined in 49 CFR 26.55(d)(1) through (4) and (6).

DBE Commitment Submittal

Submit Local Agency Bidder DBE Commitment (Construction Contracts), Exhibit 15-G, form, included in the Bid book with the bid. **If the form (Exhibit 15-G) is not submitted with the bid and signed by the bidder, the bid shall be considered non-responsive**.

Submit written confirmation from each DBE stating that it is participating in the contract. Include confirmation with the DBE Commitment form. A copy of a DBE's quote will serve as written confirmation that the DBE is participating in the contract. If written confirmation is not submitted with the bid, it must be received by the agency no later than 4:00 p.m. on the 4th business day after bid opening. Written confirmation shall be submitted by the apparent low bidder, the apparent second low bidder and the apparent third low bidder.

Good Faith Efforts Submittal

Bidders shall complete and submit the DBE Information - Good Faith Efforts, Exhibit 15-H, form with the bid showing that you made adequate good faith efforts to meet the goal. Only good faith

efforts directed towards obtaining participation by DBEs will be considered. Submit exhibit 12-B "Bidder's List of Subcontractors (DBE and Non-DBE) Part I & II" with the good faith efforts documentation. If good faith efforts documentation is not submitted with the bid, it must be received by the County no later than 4:00 p.m. on the 4th business day after bid opening. Good faith efforts documentation shall be submitted by the apparent low bidder, the apparent second low bidder and the apparent third low bidder.

You must also submit good faith efforts documentation within the specified time to protect your eligibility for award of the contract in the event the County finds that the DBE goal has not been met. If good faith efforts documentation is not submitted with the bid within the specified time, the bid will be considered non-responsive.

Good faith efforts documentation must include the following information and supporting documents, as necessary:

1. Items of work you have made available to DBE firms. Identify those items of work you might otherwise perform with your own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, show the dollar value and percentage of the total contract. It is your responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.

2. Names of certified DBEs and dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. You are reminded to solicit certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.

3. Name of selected firm and its status as a DBE for each item of work made available. Include name, address, and telephone number of each DBE that provided a quote and their price quote. If the firm selected for the item is not a DBE, provide the reasons for the selection.

4. Name and date of each publication in which you requested DBE participation for the project. Attach copies of the published advertisements.

5. Names of agencies and dates on which they were contacted to provide assistance in contacting, recruiting, and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.

6. List of efforts made to provide interested DBEs with adequate information about the plans, specifications, and requirements of the contract to assist them in responding to a solicitation. If you have provided information, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Provide copies of supporting documents, as appropriate.

7. List of efforts made to assist interested DBEs in obtaining bonding, lines of credit, insurance, necessary equipment, supplies, and materials, excluding supplies and equipment that the DBE subcontractor purchases or leases from the prime contractor or its affiliate. If such assistance is provided by you, identify the name of the DBE assisted, nature of the assistance offered, and date assistance was provided. Provide copies of supporting documents, as appropriate.

8. Any additional data to support demonstration of good faith efforts.

The County may consider DBE commitments of the 2nd and 3rd bidders when determining whether the low bidder made good faith efforts to meet the DBE goal.

Only documentation provided with the Bid and/or with the bidder's good faith efforts submittal will be considered during the County's good faith efforts determination. If the County determines that the DBE participation goal was not met and that an adequate good faith effort to obtain DBE participation was not made, the bidder's Bid will be considered non-responsive. Bidders whose good faith efforts are determined to be inadequate will be offered an administrative reconsideration by an official not involved in the initial determination.

EXHIBIT 15-G CONSTRUCTION CONTRACT DBE COMMITMENT

1. Local Agency: _____ 2. Contract DBE Goal: _____

3. Project Description: _____

4. Project Location: _____

5. Bidder's Name: _____ 6. Prime Certified DBE: ☐ 7. Bid Amount: _____

8. Total Dollar Amount for **ALL** Subcontractors: _____ 9. Total Number of **ALL** Subcontractors: __

10. Bid Item Number	11. Description of Work, Service, or Materials Supplied	12. DBE Certification Number	13. DBE Contact Information (Must be certified on the date bids are opened)	14. DBE Dollar Amount

Local Agency to Complete this Section

21. Local Agency Contract Number:

22. Federal-Aid Project Number:

23. Bid Opening Date:

24. Contract Award Date:

Local Agency certifies that all DBE certifications are valid and information on this form is complete and accurate.

25. Local Agency Representative's Signature 26. Date

27. Local Agency Representative's Name 28. Phone

29. Local Agency Representative's Title

15. TOTAL CLAIMED DBE PARTICIPATION

$

%

IMPORTANT: Identify all DBE firms being claimed for credit, regardless of tier. Names of the First Tier DBE Subcontractors and their respective item(s) of work listed above must be consistent, where applicable with the names and items of the work in the "Subcontractor List" submitted with your bid. Written confirmation of each listed DBE is required.

16. Preparer's Signature 17. Date

18. Preparer's Name 19. Phone

20. Preparer's Title

DISTRIBUTION: 1. Original – Local Agency

2. Copy – Caltrans District Local Assistance Engineer (DLAE). Failure to submit to DLAE within 30 days of contract execution may result in de-obligation of federal funds on contract. Include additional copy with award package.

ADA Notice: For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

INSTRUCTIONS – CONSTRUCTION CONTRACT DBE COMMITMENT

CONTRACTOR SECTION

1. Local Agency - Enter the name of the local or regional agency that is funding the contract.
2. Contract DBE Goal - Enter the contract DBE goal percentage as it appears on the project advertisement.
3. Project Location - Enter the project location as it appears on the project advertisement.
4. Project Description - Enter the project description as it appears on the project advertisement (Bridge Rehab, Seismic Rehab, Overlay, Widening, etc).
5. Bidder's Name - Enter the contractor's firm name.
6. Prime Certified DBE - Check box if prime contractor is a certified DBE.
7. Bid Amount - Enter the total contract bid dollar amount for the prime contractor.
8. Total Dollar Amount for ALL Subcontractors – Enter the total dollar amount for all subcontracted contractors. SUM = (DBEs + all Non-DBEs). Do not include the prime contractor information in this count.
9. Total number of ALL subcontractors – Enter the total number of all subcontracted contractors. SUM = (DBEs + all Non-DBEs). Do not include the prime contractor information in this count.
10. Bid Item Number - Enter bid item number for work, services, or materials supplied to be provided.
11. Description of Work, Services, or Materials Supplied - Enter description of work, services, or materials to be provided. Indicate all work to be performed by DBEs including work performed by the prime contractor's own forces, if the prime is a DBE. If 100% of the item is not to be performed or furnished by the DBE, describe the exact portion to be performed or furnished by the DBE. See LAPM Chapter 9 to determine how to count the participation of DBE firms.
12. DBE Certification Number - Enter the DBE's Certification Identification Number. All DBEs must be certified on the date bids are opened.
13. DBE Contact Information - Enter the name, address, and phone number of all DBE subcontracted contractors. Also, enter the prime contractor's name and phone number, if the prime is a DBE.
14. DBE Dollar Amount - Enter the subcontracted dollar amount of the work to be performed or service to be provided. Include the prime contractor if the prime is a DBE. See LAPM Chapter 9 for how to count full/partial participation.
15. Total Claimed DBE Participation - $: Enter the total dollar amounts entered in the "DBE Dollar Amount" column. %: Enter the total DBE participation claimed ("Total Claimed DBE Participation Dollars" divided by item "Bid Amount"). If the total % claimed is less than item "Contract DBE Goal," an adequately documented Good Faith Effort (GFE) is required (see Exhibit 15-H DBE Information - Good Faith Efforts of the LAPM).
16. Preparer's Signature - The person completing the DBE commitment form on behalf of the contractor's firm must sign their name.
17. Date - Enter the date the DBE commitment form is signed by the contractor's preparer.
18. Preparer's Name - Enter the name of the person preparing and signing the contractor's DBE commitment form.
19. Phone - Enter the area code and phone number of the person signing the contractor's DBE commitment form.
20. Preparer's Title - Enter the position/title of the person signing the contractor's DBE commitment form.

LOCAL AGENCY SECTION

21. Local Agency Contract Number - Enter the Local Agency contract number or identifier.
22. Federal-Aid Project Number - Enter the Federal-Aid Project Number.
23. Bid Opening Date - Enter the date contract bids were opened.
24. Contract Award Date - Enter the date the contract was executed.
25. Local Agency Representative's Signature - The person completing this section of the form for the Local Agency must sign their name to certify that the information in this and the Contractor Section of this form is complete and accurate.
26. Date - Enter the date the DBE commitment form is signed by the Local Agency Representative.
27. Local Agency Representative's Name - Enter the name of the Local Agency Representative certifying the contractor's DBE commitment form.
28. Phone - Enter the area code and phone number of the person signing the contractor's DBE commitment form.
29. Local Agency Representative Title - Enter the position/title of the Local Agency Representative certifying the contractor's DBE commitment form.

EXHIBIT 15-H DBE INFORMATION —GOOD FAITH EFFORTS

DBE INFORMATION - GOOD FAITH EFFORTS

Federal-aid Project No._____Bid Opening Date _____

The_____established a Disadvantaged Business Enterprise (DBE) goal of

_____% for this project. The information provided herein shows that a good faith effort was made.

Lowest, second lowest and third lowest bidders shall submit the following information to document adequate good faith efforts. Bidders should submit the following information even if the "Local Agency Bidder DBE Commitment" form indicates that the bidder has met the DBE goal. This will protect the bidder's eligibility for award of the contract if the administering agency determines that the bidder failed to meet the goal for various reasons, e.g., a DBE firm was not certified at bid opening, or the bidder made a mathematical error.

Submittal of only the "Local Agency Bidder DBE Commitment" form may not provide sufficient documentation to demonstrate that adequate good faith efforts were made.

The following items are listed in the Section entitled "Submission of DBE Commitment" of the Special Provisions:

A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (please attach copies of advertisements or proofs of publication):

Publications	Dates of Advertisement

B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested (please attach copies of solicitations, telephone records, fax confirmations, etc.):

Names of DBEs Solicited	Date of Initial Solicitation	Follow Up Methods and Dates

C. The items of work which the bidder made available to DBE firms including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to facilitate DBE participation was made available to DBE firms.

Items of Work	Bidder Normally Performs Item (Y/N)	Breakdown of Items	Amount ($)	Percentage Of Contract

D. The names, addresses and phone numbers of rejected DBE firms, the reasons for the bidder's rejection of the DBEs, the firms selected for that work (please attach copies of quotes from the firms involved), and the price difference for each DBE if the selected firm is not a DBE

Names, addresses and phone numbers of rejected DBEs and the reasons for the bidder's rejection of the DBEs:

_____
_____
_____
_____

Names, addresses and phone numbers of firms selected for the work above:

_____
_____
_____
_____

E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs:

_____
_____
_____
_____
_____

F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate:

_____
_____
_____
_____

G. The names of agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using DBE firms (please attach copies of requests to agencies and any responses received, i.e., lists, Internet page download, etc.):

Name of Agency/Organization	Mehtod/Date of Contact	Results

H. Any additional data to support a demonstration of good faith efforts (use additional sheets if necessary):

_____
_____

NOTE: USE ADDITIONAL SHEETS OF PAPER IF NECESSARY

SECTION 000210 WAGE RATES AND FEDERAL TRAINEE PROGRAM PROVISIONS

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done, have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, are on file with the Clerk of the Board of Supervisors and will be made available to any interested person on request. Also, the General Prevailing Wage Rates are available from the California Department of Industrial Relations' Internet web site at http://www.dir.ca.gov.

A listing of the federal wage rates applicable to this project may be found at: https://www.wdol.gov/dba.aspx . The Federal wage rates are predetermined by the United States Secretary of Labor; Contractor is responsible to check current wage rates at the listed website. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to the project plan holders. Future effective general prevailing wage rates, which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in Section 000210.

For the Federal training program, the number of trainees or apprentices is___0___.

This section applies if a number of trainees or apprentices is specified in the special provisions.

As part of your equal opportunity affirmative action program, provide on-the-job training to develop full journeymen in the types of trades or job classifications involved.

You have primary responsibility for meeting this training requirement.

If you subcontract a contract part, determine how many trainees or apprentices are to be trained by the subcontractor.

Include these training requirements in your subcontract.

Where feasible, 25 percent of apprentices or trainees in each occupation must be in their 1st year of apprenticeship or training.

Distribute the number of apprentices or trainees among the work classifications on the basis of your needs and

the availability of journeymen in the various classifications within a reasonable recruitment area.

Before starting work, submit to the County of Tulare:

1. Number of apprentices or trainees to be trained for each classification
2. Training program to be used
3. Training starting date for each classification

Obtain the County of Tulare's approval for this submitted information before you start work. The County of Tulare credits you for each apprentice or trainee you employ on the work who is currently enrolled or becomes enrolled in an approved program. The primary objective of this section is to train and upgrade minorities and women toward journeymen status. Make every effort to enroll minority and women apprentices or trainees, such as conducting systematic and direct recruitment through public and private sources likely to yield minority and women apprentices or trainees, to the extent they are available within a reasonable recruitment area. Show that you have made the efforts. In making these efforts, do not discriminate against any applicant for training.

Do not employ as an apprentice or trainee an employee:

1. In any classification in which the employee has successfully completed a training course leading to journeyman status or in which the employee has been employed as a journeyman

2. Who is not registered in a program approved by the US Department of Labor, Bureau of Apprenticeship and Training

Ask the employee if the employee has successfully completed a training course leading to journeyman status or has been employed as a journeyman. Your records must show the employee's answers to the questions. In your training program, establish the minimum length and training type for each classification. The County of Tulare and FHWA approves a program if one of the following is met:

1. It is calculated to:
    - Meet the your equal employment opportunity responsibilities
    - Qualify the average apprentice or trainee for journeyman status in the classification involved by the end of the training period
2. It is registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, and it is administered in a way consistent with the equal employment responsibilities of Federal-aid highway construction contracts

Obtain the State's approval for your training program before you start work involving the classification covered by the program. Provide training in the construction crafts, not in clerk-typist or secretarial-type positions. Training is allowed in lower level management positions such as office engineers, estimators, and timekeepers if the training is oriented toward construction applications. Training is allowed in the laborer classification if significant and meaningful training is provided and approved by the division office. Off-site training is allowed if the training is an integral part of an approved training program and does not make up a significant part of the overall training.

The County of Tulare reimburses you 80 cents per hour of training given an employee on this contract under an approved training program:

1. For on-site training

2. For off-site training if the apprentice or trainee is currently employed on a Federal-aid project and you do at least one of the following:

- Contribute to the cost of the training
- Provide the instruction to the apprentice or trainee
- Pay the apprentice's or trainee's wages during the off-site training period 3. If you comply this section.

3. If you comply with this section.

Each apprentice or trainee must:

1. Begin training on the project as soon as feasible after the start of work involving the apprentice's or trainee's skill

2. Remain on the project as long as training opportunities exist in the apprentice's or trainee's work classification or until the apprentice or trainee has completed the training program Furnish the apprentice or trainee:

a. Copy of the program you will comply with in providing the training

b. Certification showing the type and length of training satisfactorily completed

END OF SECTION 000210

SECTION 000310 - BID FORM

Bidder: _____

Address: _____

Phone: _____

Fax: _____

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

County's Representative: Resource Management Agency
Ross Miller, Chief Engineer
County of Tulare
5961 S. Mooney Blvd.
Visalia, Ca. 93277
559-624-7070 – Phone

County Project Number: _____

Consultant: Kyle Swanson
Arrington Watkins Architects
5240 N. 16th Street
Phoenix, AZ
602-279-9110 – Phone

Consultant Project Number: 2015.134.01

Bid For: CNG Fueling System at the Tulare County Transit Operations and Maintenance Facility 14001 Avenue 256 Visalia, CA 93292

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

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

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

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4. **Liquidated Damages for Failure to Enter into the Agreement**:

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

5. The CONTRACTOR agrees-

a. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carries, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

b. To Furnish within 20 days following the date of loading for shipments originating within the United State or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated "on-board" commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590. 3. To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

6. Undersigned acknowledges receipt of the following Addenda:

Addendum No._____ Dated_____ Addendum No._____ Dated_____
Addendum No._____ Dated_____ Addendum No._____ Dated_____

7. This Bid is valid for ninety (90) calendar days following the date for receiving Bids.

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

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

1. _____ Dollars
(Amount Written in Words)
($_____). (Figures)

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BID ITEM COSTS

ITEM NO.	ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
1	Traffic Rated Valve Box @_____ _____ Dollars Each	EA	8	$_____ /EA	$_____
2	600-amp feeder to Compressor Controller @_____ _____ Dollars Per Linear Foot	LF	100	$_____ / LF	$_____
3	Circuits to Gas Compressor System from Compressor Controller @_____ _____ Dollars Per Linear Foot	LF	50	$_____ / LF	$_____
4	Dual Compressor Connection @_____ _____ _____Dollars Each	EA	1	$_____/ EA	$_____
5	Heat Regenerative Gas Dryer Connection @_____ _____ _____Dollars Each	EA	1	$_____/EA	$_____
6	Trenching and Backfill for Gas Piping and Conduit @_____ _____ _____Dollars Per Linear Foot	LF	1,409	$_____/LF	$_____
7	1-in Stainless Steel Tubing in 3-in Conduit: @_____ _____ _____ Dollars Per Linear Foot	LF	856	$_____ /LF	$_____
8	3in Gas Rate Polyethylene Pipe@_____ _____ Dollars Per Linear Foot	LF	293	$_____ /LF	$_____
9	3in Conduit@_____ _____ Dollars Per Linear Foot	LF	1,034	$_____ /LF	$_____

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BID ITEM COSTS CONTINUED

ITEM NO.	ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
10	4in Conduit @_____ _____ Dollar Per Linear Foot	LF	82	$_____ /LF	$_____
11	Dual Compressor with Control Panel@_____ _____ _____ _____Dollars Each	EA	1	$_____/EA	$_____
12	Heat Regenerative Gas Dryer @_____ _____ Dollars Each	EA	1	$_____/EA	$_____
13	Dual Hose Time Fill Post Dispenser @_____ _____Dollars Each	EA	12	$_____ /EA	$_____
14	Bollards at Time Fill Dispenser@_____ _____ Dollars Each	EA	16	$_____ /EA	$_____
15	Meter@_____ _____ Dollars Each	EA	1	$_____ / EA	$_____
16	Emergency Shutdown Station @_____ _____ Dollars Each	EA	13	$_____ / EA	$_____
17	Freight@_____ _____ _____Dollars Lump Sum	LS	1	$_____/ LS	$_____
18	Factory Start-Up @_____ _____ _____Dollars Lump Sum	LS	1	$_____/LS	$_____
19	Misc. Piping, etc.@_____ _____ _____ Dollars Lump Sum	LS	1	$_____/LS	$_____

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BID ITEM COSTS CONTINUED

ITEM NO.	ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
20	Electrical Distribution Trenching@_____ _____ _____ ____Dollars Per Linear Foot	LF	2,350	$_____ /LF	$_____
21	Underground Electrical for Security and Shutdown@_____ _____ _____Dollars Per Linear Foot	LF	1,200	$_____/LF	$_____
22	AC Paving Heavy Duty@_____ _____ ____Dollars Per Square Foot	SF	90,485	$_____/SF	$_____
23	Striping Parking Stalls Bus@_____ _____ Dollars Each	EA	24	$_____ / EA	$_____
24	Striping Painted Islands@_____ _____ Dollars Each	EA	6	$_____ / EA	$_____
25	Striping Directional Arrows/Markers@_____ _____ _____ _____Dollars Each	EA	8	$_____/ EA	$_____
26	Lane Separator in Storage Area @_____ _____ _____Dollars Per Linear Foot	LF	376	$_____ /LF	$_____
27	Signage shown on CG-C4.03 @_____ _____ Dollars Lump Sum	LS	1	$_____ /LS	$_____
28	Valves to be adjusted to grade @_____ _____ Dollars Each	EA	3	$_____ /EA	$_____

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BID ITEM COSTS CONTINUED

ITEM NO.	ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE (IN FIGURES)	ITEM TOTAL (IN FIGURES)
29	Drain inlets to be adjusted to grade @_____ _____ Dollars Each	EA	2	$_____ /EA	$_____
30	Manhole to be adjusted to grade@_____ _____ Dollars Each	EA	1	$_____ / EA	$_____
31	Concrete Foundation at CNG equipment @_____ _____ Dollars Per Square Foot	SF	976 SF	$_____ /SF	$_____
32	Concrete K rails at CNG equipment 20' long @_____ _____ Dollars Each	EA	3	$_____ /EA	$_____
33	Fire extinguisher @_____ _____ Dollars Each	EA	13	$_____ /EA	$_____
34	Priority/time-fill panel @_____ _____ Dollars Each	EA	1	$_____ /EA	$_____
35	Valves and fitting shown on CG-C4.06 @_____ _____ Dollars Each	LS	1	$_____ /LS	$_____
36	Mobilization, Demobilization, Bonds and Insurance@_____ _____ _____ Dollars Lump Sum	LS	1	$_____ /LS	$_____
37	Worker Protection@_____ _____ _____ Dollars Lump Sum	LS	1	$_____ /LS	$_____
38	Earthwork and Grading@_____ _____ _____ Dollar Lump Sum	LS	1	$_____ /LS	$_____

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Bid Item Descriptions

Bid Item 1 - Traffic Rated Valve Box - This bid item is a unit price bid for furnishing and installing a traffic rated valve box and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 2 - 600 AMP Underground Compressor Ridged PVC - This bid item includes complete conduit system, conductors, lugs and connectors, cable terminations, testing and acceptance for the feeder supplying the compressor controller from Switchboard 'CNG'.

Bid Item 3 - Circuits to Gas Compressor System from Compressor Controller - This bid item includes complete conduit systems, EYS conduit seals and sealant, conductors, lugs and connectors, cable terminations, testing and acceptance for all motors and ancillary equipment associated with the Gas Compressor system, Gas Dryer and Priority Panel and provisions for future expansion

Bid Item 4 - Dual Compressor Connection - This bid item is a unit price bid for furnishing and installing a dual compressor connection and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 5 - Heat Regenerative Gas Dryer Connection - This bid item is a unit price bid for furnishing and installing a heat regenerative gas dryer connection and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 6 - Trenching and Backfill for Gas Piping/Conduit - This bid item includes trenching, bedding, backfill and compaction. This bid item shall include the cost of any saw cutting, debris removal or other demolition work on areas identified as requiring work within the plans. This bid item is a final pay item but the quantities may be substantially increased, decreased, or eliminated by the Owner, and no adjustment in the unit price will be made. Completed trenches shall have temporary trench resurfacing installed as soon as possible. It shall be the responsibility of the Contractor to maintain said surfacing and replace it as often as necessary. Temporary trench resurfacing shall be maintained by the Contractor during and after normal working hours and on weekends and holidays. The Contractor shall inspect the condition of the temporary surfacing at sufficient intervals and make repairs as necessary. Temporary surfacing shall be removed by the Contractor prior to final resurfacing.

Bid Item 7 - 1-in Stainless Steel Tubing - This bid item includes all piping, fittings, pipe supports, and appurtenances. This item also includes all testing (compaction and

pressure) associated with piping. This bid item is a unit price bid for furnishing and installing 1-in Stainless Steel Tubing and shall be per linear foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. This bid item may be substantially increased, decreased, or eliminated, and no adjustment in the unit price will be made.

Bid Item 8 - 3-in Gas-Rated Polyethylene Pipe - This bid item includes all piping, fittings, pipe supports, and appurtenances. This item also includes all testing (compaction and pressure) associated with piping. This bid item is a unit price bid for furnishing and installing 3-in Gas-Rated Polyethylene Pipe and shall be per linear foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. This bid item may be substantially increased, decreased, or eliminated, and no adjustment in the unit price will be made.

Bid Item 9 - 3-in Conduit - This bid item includes all piping, fittings, pipe supports, and appurtenances. This item also includes all testing (compaction and pressure) associated with piping. This bid item is a unit price bid for furnishing and installing 3-in Conduit and shall be per linear foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. This bid item may be substantially increased, decreased, or eliminated, and no adjustment in the unit price will be made.

Bid Item 10 - 4-in Conduit - This bid item includes all piping, fittings, pipe supports, and appurtenances. This item also includes all testing (compaction and pressure) associated with piping. This bid item is a unit price bid for furnishing and installing 4-in Conduit and shall be per linear foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. This bid item may be substantially increased, decreased, or eliminated, and no adjustment in the unit price will be made.

Bid Item 11 - Dual Compressor with Control Panel - This bid item is a unit price bid for furnishing and installing a dual compressor with control panel and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 12 - Heat Regenerative Gas Dryer - This bid item is a unit price bid for furnishing and installing a heat regenerative gas dryer and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 13 - Dual Hose Time Fill Post Dispenser - This bid item is a unit price bid for furnishing and installing a dual hose time fill post dispenser and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 14 - Bollard at Time Fill Post Dispenser - This bid item is a unit price bid for furnishing and installing a bollard at the time fill post dispenser and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 15 - Meter - This bid item is a unit price bid for furnishing and installing a meter and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 16 - Emergency Shut Down Station - This bid item is a unit price bid for furnishing and installing an emergency shut down station and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 17 -Freight - This bid item is a lump sum bid item for freight and shall be full compensation for furnishing all labor, equipment and materials to complete the work as described herein, and no additional compensation will be made therefore.

Bid Item 18 - Factory Start-Up - This bid item is a lump sum bid item for factory start-up and shall be full compensation for furnishing all labor, equipment and materials to complete the work as described herein, and no additional compensation will be made therefore.

Bid Item 19 - Misc. Piping, etc. - This bid item includes all miscellaneous piping, fittings, pipe supports, appurtenances, and items shown on the plans that are not included in another bid item. This item also includes all testing. This bid item is a lump sum bid item for furnishing and installing miscellaneous piping and etc. complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore.

Bid Item 20 - Electrical Distribution Trenching - This bid item includes complete trenching and backfill for electrical distribution.

Bid Item 21 - Underground Electrical for Shutdown - This bid item includes complete conduit system, conductors, lugs and connectors, cable terminations, testing and acceptance for the emergency shutdown.

Bid Item 22 - AC Paving Heavy Duty - This bid item is a unit price bid for furnishing and installing heavy duty AC paving, which includes the Class II aggregate base, and shall be per square foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 23 - Striping Parking Stalls Bus - This bid item is a unit price bid for furnishing and installing striping for the bus parking stalls and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 24 - Striping Painted Islands - This bid item is a unit price bid for furnishing and installing striping for the painted islands and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 25 Striping Directional Arrows/Markers - This bid item is a unit price bid for furnishing and installing striping for the arrows/markers and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 26 - Lane Separator in Storage Area - This bid item is a unit price bid for furnishing and installing road striping for the lane separator in the storage area and shall be per linear foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 27 - Signage shown on CG-C4.03 - This bid item is a lump sum bid item for signage as shown on CG-C4.03 and shall be full compensation for furnishing all labor, equipment and materials to complete the work as described herein, and no additional compensation will be made therefore.

Bid Item 28 - Valves to be adjusted to grade - This bid item is a unit price bid for adjusting valves to grade and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the

adjustment as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 29 - Drain inlets to be adjusted to grade - This bid item is a unit price bid for adjusting drain inlets to grade and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the adjustment as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 30 - Manholes to be adjusted to grade - This bid item is a unit price bid for adjusting manholes to grade and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the adjustment as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 31 - Concrete foundation at CNG equipment - This bid item is a unit price bid for furnishing and installing the concrete foundation at the CNG equipment area and shall be per square foot complete and in place, and shall be full compensation for furnishing all labor, equipment and materials, including concrete, forms, rebar, aggregate base, and appurtenances, to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 32 - Concrete K rails at CNG equipment 20' long - This bid item is a unit price bid for furnishing and installing concrete K rails at the CNG equipment area (10' long) and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 33 - Fire extinguisher - This bid item is a unit price bid for furnishing and installing a fire extinguisher and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Bid Item 34 - Priority/time fill panel - This bid item is a unit price bid for furnishing and installing a priority/time fill panel and shall be per each complete and in place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore. The quantities may be increased, decreased, or deleted entirely by Owner, with no change in unit price.

Item No. 35 - Valves and fitting shown on CG-C4.06 - This bid item is lump sum bid item for furnishing and installing valves and fittings as shown on CG-C4.06 complete and in

place, and shall be full compensation for furnishing all labor, equipment and materials to complete the installation as described herein, and no additional compensation will be made therefore.

Bid Item 36 - Mobilization/Demobilization, Bonds, and Insurance - The lump sum payment shall include the cost of mobilization/demobilization, all necessary bonds, insurance, permits, licenses, fees, SWPPP, and any other environmental compliance items that are required during the performance of the work. Payment will be prorated, based on percentage of contract work completed.

Bid Item 37 - Worker Protection - This work shall consist of providing for worker protection from trench failures and other hazards that may occur during construction. The Contractor shall comply with the provisions of the Construction Safety Orders, Tunnel Safety Orders, and General Safety Orders issued by the State of California of Industrial Safety, as well as all other applicable laws, ordinances and regulations, as they pertain to the protection of workers from the hazard of caving ground. The Contractor shall obtain a permit from the Division of Industrial Safety of the State of California prior to commencement of construction. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

Bid Item 38 - Earthwork and Grading - This bid item includes rough and finish grading, import material and all labor and equipment required to complete the grading of the site compaction of fill material, fill areas and spreading unsuitable material at the end of the job at the direction of the Owner. This bid item will be paid for by Lump Sum.

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PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has ___ , has not ___ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1. Note: The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire: Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes _____ No _____

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

_____

_____

_____

_____

_____

(Signature) (Date)

_____

(Name and Title)

_____
(Company Name)

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EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

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

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

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

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

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PUBLIC CONTRACT CODE 10232 STATEMENT

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board. Note: The above Statement and Questionnaire are part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement and Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

_____

(Signature) (Date)

_____

(Name and Title)

_____

(Company Name)

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DEBARMENT AND SUSPENSION CERTIFICATION TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

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

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

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

_____

_____

_____

_____

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

Notes: Providing false information may result in criminal prosecution or administrative sanctions. The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

_____

(Signature) (Date)

_____

(Name and Title)

_____

(Company Name)

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NONLOBBYING CERTIFICATION FOR FEDERAL-AID CONTRACTS

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

(l) 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 sub-recipients shall certify and disclose accordingly.

_____

(Signature) (Date)

_____

(Name and Title)

_____

(Company Name)

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Approved by OMB
0348-0046

Disclosure of Lobbying Activities

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure)

1. Type of Federal Action: a. contract ____ b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	**2. Status of Federal Action:** a. bid/offer/application _____ b. initial award c. post-award	**3. Report Type:** a. initial filing _____ b. material change **For material change only:** Year _____ quarter _____ Date of last report_____
4. Name and Address of Reporting Entity: ____ Prime _____ Subawardee Tier_____, if Known: **Congressional District,** *if known*:	**5. If Reporting Entity in No. 4 is Subawardee,** Enter Name and Address of Prime: **Congressional District,** *if known*:	
6. Federal Department/Agency:	**7. Federal Program Name/Description:** CFDA Number, *if applicable*: _____	
8. Federal Action Number, *if known:*	**9. Award Amount**, *if known:* **$**	
10. a. Name and Address of Lobbying Registrant *(if individual, last name, first name, MI):*	**b. Individuals Performing Services** *(including address if different from No. 10a)* *(last name, first name, MI):*	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	**Signature: _____** **Print Name: _____** **Title: _____** **Telephone No.: _____ Date: _____**	
Federal Use Only	**Authorized for Local Reproduction** **Standard Form - LLL (Rev. 7-97)**	

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INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a follow up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or sub-award recipient. Identify the tier of the sub-awardee, e.g., the first sub-awardee of the prime is the 1st tier. Sub-awards include but are not limited to subcontracts, sub-grants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Sub-awardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503

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BID GUARANTEE

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

_____Dollars

($_____).

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

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

REGISTRATION WITH DIR

The undersigned further states that it is currently registered as a public works contractor with the DIR pursuant to California Labor Code section 1725.5 and qualified to perform public work projects.

SUBMISSION OF BID

A. Respectfully submitted this ____ day of _____, 2019.

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

C. Authorized Signature:_____(Handwritten signature).

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

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

F. Type of Organization:_____

G. Witnessed By:_____(Handwritten signature).

H. Attest:_____(Handwritten signature).

I. By:_____(Type or print name).

J. Title:_____(Corporate Secretary or Assistant Secretary).

K. Street Address:_____.

L. City, State, Zip:_____.

M. Phone:_____.

N. License No.:_____.

O. Federal ID No.:_____(Affix Corporate Seal Here).

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Type of Organization _____
(Individual, Partnership, Corporation, Etc.)

Company's Name _____

(Type or Print)

Partner's Names _____
(If Partnership)

_____

Seal (If Corporation)

Date: _____

By: _____
(Signature of Contractor)

_____
(Type Name of Contractor)

Address: _____

_____

Telephone: _____

Attachments:

Contractor License:

DIR Registration No.: _____

Class: _____

Numbers: _____

Expiration Dates: _____

_____ Bid Security
_____ Sub-contractor List
_____ Non-Collusion Declaration
_____ Corporate Resolution authorizing Signature of Document, if Corporation
_____ Public Contract Code Section 10285.1 Statement
_____ Public Contract Code 10232 Statement
_____ Debarment and Suspension Certification
_____ Nonlobbying Certification for Federal Aid Contracts
_____ Disclosure of Lobbying Activities
_____ Certificate of Buy American Compliance
_____ Certification of Exclusion of Builder's Risk Insurance Cost

END OF SECTION 00310

SECTION 000315 - SUBCONTRACTOR LIST FORM

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

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

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

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

The failure of the Contractor to specify a subcontractor for any portion of the contract work in excess of one-half of one percent of the total contract price shall be deemed to indicate that the Contractor intends to perform such portion itself. The subletting or subcontracting of work for which no subcontractor was designated in the original bid and which is in excess of one-half of one percent of the total contract price, will be allowed only in accordance with Public Contract Code Section 4109.

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BIDDER'S LIST OF SUBCONTRACTORS
(Use extra sheets if necessary)

	Subcontractor Information			Work Portion	
Name	**Address**	**DIR Number**	**Lic. No.**	**Bid Item No. and Description**	**Dollar Amount of Work**
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					

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(Subcontractor List continued)

	Subcontractor Information			Work Portion	
Name	**Address**	**DIR Number**	**Lic. No.**	**Bid Item No. and Description**	**Dollar Amount of Work**
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					
DBE ☐YES ☐ NO DBE Cert No. _____					

Date _____ Contractor's Signature _____

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Exhibit 12-B (Optional Form): Bidder's List of Subcontractors (DBE and Non-DBE) Part 1

As of March 1, 2015 Contractors (and sub-contractors) wishing to bid on public works contracts may be registered with the State Division of Industrial Relations and certified to bid on Public Works contracts. Please register at: https://efiling.dir.ca.gov/PWCR/ActionServlet?action=displayPWCRegistrationForm

In accordance with Title 49, Section 26.11 of the Code of Federal Regulations, and Section 4104 of the Public Contract Code of the State of California, as amended, the following information may be used by the local agency to track each sub-contractor who will perform work amounting to more than one half of one percent (0.5%) of the Total Base Bid or $10,000 (whichever is greater). **Photocopy this form for additional firms.** Federal Project Number: ________________

Subcontractor Name and Location	Line Item & Description	Subcontract Amount	Percentage of Bid Item Sub-contracted	Contractor License Number DIR Reg Number	DBE (Y/N)	DBE Cert Number	Annual Gross Receipts
Name:							<$1 million
City, State:							<$5 million
							<$10 million
							<$15 million
							Age of Firm:____ yrs.
Name:							<$1 million
City, State:							<$5 million
							<$10 million
							<$15 million
							Age of Firm:____yrs.
Name:							<$1 million
City, State:							<$5 million
							<$10 million
							<$15 million
							Age of Firm:____yrs.
Name:							<$1 million
City, State:							<$5 million
							<$10 million
							<$15 million
							Age of Firm:____yrs.
Name:							<$1 million
City, State:							<$5 million
							<$10 million
							<$15 million
							Age of Firm:____yrs.
Name:							<$1 million
City, State:							<$5 million
							<$10 million
							<$15 million
							Age of Firm:____yrs.

Distribution: Original-Local Agency File

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Exhibit 12-B (Optional Form): Bidder's List of Subcontractors (DBE and Non-DBE) Part 2

As of March 1, 2015 Contractors (and sub-contractors) wishing to bid on public works contracts may be registered with the State Division of Industrial Relations and certified to bid on Public Works contracts. Please register at: https://efiling.dir.ca.gov/PWCR/ActionServlet?action=displayPWCRegistrationForm

In accordance with Title 49, Section 26.11 of the Code of Federal Regulations, and Section 4104 of the Public Contract Code of the State of California, as amended, the following information may be used by the local agency to track each sub-contractor who will perform work amounting to more than one half of one percent (0.5%) of the Total Base Bid or $10,000 (whichever is greater). **Photocopy this form for additional firms.**

Federal Project Number: ____________________________________

Subcontractor Name and Location	Line Item & Description	Subcontract Amount	Percentage of Bid Item Sub-contracted	Contractor License Number DIR Reg Number	DBE (Y/N)	DBE Cert Number		Annual Gross Receipts
Name:								<$1 million
City, State:								<$5 million
								<$10 million
								<$15 million
								Age of Firm:____yrs.
Name:								<$1 million
City, State:								<$5 million
								<$10 million
								<$15 million
								Age of Firm:____yrs.
Name:								<$1 million
City, State:								<$5 million
								<$10 million
								<$15 million
								Age of Firm:____yrs.
Name:								<$1 million
City, State:								<$5 million
								<$10 million
								<$15 million
								Age of Firm:____yrs.
Name:								<$1 million
City, State:								<$5 million
								<$10 million
								<$15 million
								Age of Firm:____yrs.
Name:								<$1 million
City, State:								<$5 million
								<$10 million
								<$15 million
								Age of Firm:____yrs.

END OF SECTION 000315

SECTION 000316 – NON COLLUSION DECLARATION AND CERTIFICATION OF EXCLUSION OF BUILDER'S RISK INSURANCE COST

NONCOLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Public Contract Code Section 7106)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

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

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on
_____ [date], at _____ [city],
_____ [state]."

_____
(signature)

_____
(Print name and Title)

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Certification of Exclusion of Builder's Risk Insurance Cost

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

Dated:

X _____

Contractor

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END OF SECTION 000316

SECTION 000317 - CERTIFICATE OF BUY AMERICAN COMPLIANCE

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter "X" in the appropriate box.

☐ Bidder or offeror hereby certifies that it will comply with 49 USC. 50101 by:

1. Only installing steel and manufactured products produced in the United States; or
2. Installing manufactured products for which the DOT has issued a waiver as indicated by inclusion on the current DOT Nationwide Buy American Waivers Issued listing; or
3. Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing US domestic products.
3. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the DOT determines justified.

☐ The bidder or offeror hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

1. To the submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination that may result in rejection of the proposal.
3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the DOT.
4. To furnish US domestic product for any waiver request that the DOT rejects.
5. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the DOT determines justified.

Required Documentation

Type 3 Waiver - The cost of components and subcomponents produced in the United States is more that 60% of the cost of all components and subcomponents of the "facility". The required documentation for a type 3 waiver is:

1. Listing of all manufactured products that are not comprised of 100% US domestic content (Excludes products listed on the DOT Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety)
2. Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.

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3. Percentage of non-domestic component and subcomponent cost as compared to total "facility" component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

Type 4 Waiver – Total cost of project using US domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a type 4 of waiver is:

1. Detailed cost information for total project using US domestic product
2. Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date	Signature
Company Name	Title

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END OF SECTION 000317

SECTION 000318 FHWA 1273 FEDERAL CONTRACT PROVISIONS

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. **Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. **Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1)) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2)) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3)) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2)) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3)) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4)) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2)) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3)) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4)) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1)) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2)) the prime contractor remains responsible for the quality of the work of the leased employees;
(3)) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4)) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. **Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

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

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

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

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

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

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

a. 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.

b. 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 Form to Report Lobbying," in accordance with its instructions.

2. 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 31 U.S.C. 1352. 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.

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

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

END OF SECTION 000318

SECTION 000501 - BID BOND

COUNTY OF TULARE
STATE OF CALIFORNIA

BIDDER'S BOND

KNOW ALL MEN BY THESE PRESENTS:

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

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas, the Principal has submitted the above-mentioned bid to the Board of Supervisors, County of Tulare, for certain construction specifically described as follows, for which bids are to be opened at Visalia, California, on **Wednesday February 13, 2019**, for construction on the Tulare County – **CNG Fueling Facility at the Transit Operations and Maintenance Facility Project, 140001 Avenue 256, Visalia, CA 93292.**

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

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

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____ day of _____, 2019.

_____ (Seal)
_____ (Seal)
_____ (Seal)
Principal

_____ (Seal)
_____ (Seal)
_____ (Seal)
Surety

Note: Signature of those executing for the surety must be properly acknowledged or notarized.

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END OF SECTION 000501

SECTION 000502 – STATUTORY PERFORMANCE BOND

STATUTORY PERFORMANCE BOND PURSUANT TO
California Public Contract Code
Section 20129

KNOW ALL MEN BY THESE PRESENTS:

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

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

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

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

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

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

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

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

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

Witness our hands this _____ day of _____.

_____
Principal Seal

_____
By

_____
Surety Seal

_____
By

_____
Agency of Record

Note: Bond surety must be admitted to transact surety insurance in the State of California

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END OF SECTION 000502

SECTION 000503 – STATUTORY PAYMENT BOND

STATUTORY PAYMENT BOND PURSUANT TO
California Civil Code
Sections 9550 through 9566

KNOW ALL THESE MEN BY THESE PRESENTS:

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

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

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

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

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

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claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

Witness our hands this _____ day of _____

_____
Principal Seal

_____
By

_____
Surety Seal

_____
By

_____
Agency of Record

_____
Agency Address

Note: Bond surety must be admitted to transact surety insurance in the State of California.

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END OF SECTION 000503

SECTION 000504 - CERTIFICATION CONCERNING WORKER'S COMPENSATION

STATE OF CALIFORNIA)
) SS.
COUNTY OF TULARE)

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

_____
Date

_____
Contractor's Signature

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END OF SECTION 000504

SECTION 000506 - AGREEMENT BETWEEN COUNTY AND CONTRACTOR

AGREEMENT

BETWEEN

COUNTY AND CONTRACTOR

AGREEMENT

made as of the _____ day of _____ in the year of Two Thousand and Nineteen

BETWEEN the County: **COUNTY OF TULARE, STATE OF CALIFORNIA**

and the Contractor: _____

The Project: Tulare County –
CNG Fueling System at the Tulare County Transit Operations and Maintenance Facility
14001 Avenue 256 Visalia, CA 93292

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

The Architect: Kyle Swanson – Arrington Watkins Architects

The County and the Contractor agree as set forth below.

ARTICLE 1
THE CONTRACT DOCUMENTS

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

ARTICLE 2
THE WORK

The Contractor shall perform all the Work required by the Contract Documents for the Tulare County – Transit Operations and Maintenance Facility at 14001 Avenue 256 Visalia, CA 93292

ARTICLE 3
TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The Work to be performed under this Contract shall be commenced within Ten (10) calendar days after the date established in the Notice to Proceed and, subject to authorized adjustments, Substantial Completion of the Work Shall be achieved not later than **240** calendar days after the date established in the Notice to Proceed.

If Contractor fails to complete the Work within the Contract Time, Contractor shall pay to County, as liquidated damages and not as a penalty, the sum of $1540.00 for each day after the expiration of the Contract Time that the Work remains incomplete. County and Contractor agree that if the Work is not completed within the Contract Time, then County's damages would be extremely difficult or impracticable to determine and that the aforesaid amount is a reasonable estimate of the reasonable sum for such damages. County may deduct any liquidated damages due from Contractor from any amounts otherwise due to Contractor under the Contract Documents. This provision shall not limit any right or remedy of County in the event of any other default of Contractor other than failing to complete the Work within the Contract Time.

ARTICLE 4
CONTRACT SUM

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

ARTICLE 5
PROGRESS PAYMENTS

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

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

ARTICLE 6
FINAL PAYMENT

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

ARTICLE 7
MISCELLANEOUS PROVISIONS

7.1 Terms used in this Agreement, which are defined in the "GENERAL CONDITIONS" of the contract shall have the meanings designated in those Conditions.

7.2 Notices shall be addressed as follow:

COUNTY	CONTRACTOR
Resource Management Agency County of Tulare County Civic Center 5961 S. Mooney Blvd. Visalia, CA 93291 (559) 624-7000	_____ _____ _____ _____ _____ _____
COUNTYS REPRESENTATIVE	**SURETY**
Ross Miller – County of Tulare Resource Management Agency 5961 S. Mooney Blvd. Visalia, CA 93277 (559) 624-7070 – Phone	_____ _____ _____ _____ _____

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

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

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

7.6 **INDEPENDENT CONTRACTOR STATUS:**

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

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

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

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

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

iv. Make disability insurance contributions on behalf of CONTRACTOR.

v. Obtain unemployment compensation insurance on behalf of CONTRACTOR.

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

7.7 **INDEMNIFICATION:** CONTRACTOR shall hold harmless, defend and indemnify COUNTY, its agents, officers and employees from and against any liability, claims, actions, costs, damages or losses of any kind, including death or injury to any person and/or damage to property, including COUNTY property, arising from, or in connection with, the performance by CONTRACTOR or its agents, officers and employees under this Agreement. This indemnification specifically includes any claims that may be made against COUNTY by any taxing authority asserting that an employer-employee relationship exists by reason of this Agreement, and any claims made against COUNTY alleging civil rights violations by CONTRACTOR under Government Code sections 12920 et seq. (California Fair Employment and Housing Act), and any fines or penalties imposed on COUNTY for CONTRACTORS failure to provide form DE-542, when applicable. This indemnification obligation shall continue beyond the term of this Agreement as to any acts or omissions occurring under this Agreement or any extension of this Agreement.
The absence of insurance or insufficient insurance limits will not eliminate the obligation to indemnify.

7.8 **CONFLICT OF INTEREST:**

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

any business firm in which CONTRACTOR has an interest, with certain narrow exceptions.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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///
///

This Agreement entered into as of the day and year first written above.

COUNTY

_____
CHAIRMAN, BOARD OF SUPERVISORS

CONTRACTOR

_____
Signature

_____
Typed Name

_____
Signature

_____
Typed Name

_____
_____
_____
Address

COUNTY OF TULARE
Civic Center
Visalia, CA 93291

ATTEST: Jason Britt
County Administrative Officer/Clerk of
The Board of Supervisors of the
County of Tulare

BY: _____

APPROVED AS TO FORM

_____
County Counsel

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END OF SECTION 000506

SECTION 000507 - WAGE DETERMINATIONS

This contract is subject to federal minimum wage rates as well state and local minimum wage rates. The federal minimum wage rates are available directly from the Department of Labor Hom Page under www.wdol.gov/dba.aspx Click on "Browse all determination by State" then click on "California". If any changes to federal minimum wage rates occur prior to within ten (10) days of the bid opening, the County will issue an addendum notifying all planholders of the change. It is the Contractors responsibility to determine the applicable minimum wage rate by visiting the Department of Labor website. The County will include a copy of the applicable Federal Minimum Wage Rates with the Contract prior to execution of the Contract.

General prevailing wage determinations for the State of California are available at the following link: https://www.dir.ca.gov/OPRL/DPreWageDetermination.htm

Listed on the following pages are the Federal Wage Rates applicable to this project as of February 26, 2019:

General Decision Number: CA190016 02/01/2019 CA16
Superseded General Decision Number: CA20180027
State: California
Construction Type: Building
County: Tulare County in California.

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor
must pay all workers in any classification listed on this wage determination at least $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is
higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019
1	02/01/2019

ELEC0100-001 09/01/2018

	Rates	Fringes
ELECTRICIAN	$ 38.25	22.55

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* IRON0377-002 01/01/2019

	Rates	Fringes
Ironworkers:		
Fence Erector	$ 32.58	23.41
Ornamental, Reinforcing and Structural	$ 39.00	32.05

PREMIUM PAY:

$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland, Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island,

Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

PLAS0300-005 07/01/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 33.49	23.67

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* PLUM0246-002 01/01/2019

	Rates	Fringes
PLUMBER & STEAMFITTER	$ 40.15	32.64

SFCA0669-004 04/01/2018

	Rates	Fringes
SPRINKLER FITTER (FIRE)	$ 38.85	21.87

SHEE0104-008 07/01/2018

	Rates	Fringes
SHEET METAL WORKER (excluding metal deck and siding)	$ 38.49	35.65

SHEE0104-012 07/01/2018

	Rates	Fringes
SHEET METAL WORKER Metal deck and siding only	$ 39.93	32.70

SUCA1984-001 10/01/1984

	Rates	Fringes
BRICKLAYER	$ 15.18	
CARPENTER	$ 13.36	4.24

Drywall taper.....$ 13.08

FLOOR LAYER: Carpet..... .$ 10.72 1.76

GLAZIER.....$ 12.52 5.21

Hod Carrier
Brick.....$ 11.76
Plaster..... .$ 9.00 1.55
LABORER.....$ 7.83 2.86
PAINTER.....$ 9.87

PLASTERER.....$ 12.05 2.94

Power equipment operators:
Loader.....$ 9.65 .62
Motor grader.....$ 11.19 .62
Tractor.....$ 8.53 .62
ROOFER.....$ 10.05 3.85

Rates Fringes
Truck drivers:
Dump Truck.....$ 8.95 .62
Water truck.....$ 7.50 .62

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is
like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular
rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers
A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of
the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers
Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all
rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which
these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers
Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those
classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted unionaverage rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage
determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- an existing published wage determination
- a survey underlying a wage determination
- a Wage and Hour Division letter setting forth a position on
- a wage determination matter
- a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

GENERAL CONTRACTOR

IS REQUIRED

TO POST

THE

FEDERAL, STATE AND LOCAL WAGE DETERMINATIONS

ON THE JOB SITE

FOR THE PROJECT:

TULARE COUNTY TRANSIT OPERATIONS AND MAINTENANCE FACILITY
14001 AVENUE 256 VISALIA, CA 93292

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END OF SECTION 000507

SECTION 000509 - PAYROLL SUBMITTAL INFORMATION

1.1 **INSTRUCTIONS FOR PAYROLL SUBMITTALS**

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

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

B. Number of Withholding Exemptions.

C. Work Classification.

D. Day, Date and Hours Worked.

E. Total Hours.

F. Rate of Pay.

G. Gross Pay.

H. Deductions.

I. Net Wages Paid.

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END OF SECTION 000508

CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT
(Civil Code Section 8132)

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

Identifying Information

Name of Claimant: _____

Name of Customer: **County of Tulare**

Job Location: **14001 Avenue 256, Visalia, CA 93292**

Owner: **County of Tulare**

Through Date: _____

Conditional Waiver and Release

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

Maker of Check: **County of Tulare**

Amount of Check: $_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

(1) Retentions.

(2) Extras for which the claimant has not received payment.

(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): $_____

(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

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UNCONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT
(Civil Code Section 8134)

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

Identifying Information

Name of Claimant:_____

Name of Customer: **County of Tulare**

Job Location: **14001 Avenue 256, Visalia, CA 93292**

Owner: **County of Tulare**

Through Date:_____

Unconditional Waiver and Release

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

Exceptions

This document does not affect any of the following:

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

Signature

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

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

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

Identifying Information:

Name of Claimant:_____

Name of Customer: **County of Tulare**

Job Location: **14001 Avenue 256, Visalia, CA 93292**

Owner: **County of Tulare**

Through Date: _____

Conditional Waiver and Release

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

Maker of Check: **County of Tulare**

Amount of Check: $_____

Check Payable to:_____

Exceptions

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

Signature

Claimant's Signature:_____

Claimant's Title: _____

Date of Signature: _____

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UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT
(Civil Code Section 8138)

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

Identifying Information

Name of Claimant: _____

Name of Customer: **County of Tulare**

Job Location: **14001 Avenue 256, Visalia, CA 93292**

Owner: **County of Tulare**

Through Date: _____

Unconditional Waiver and Release

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

Exceptions

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

Signature

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

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END OF SECTION 000509

SECTION 000700 - GENERAL CONDITIONS

TABLE OF ARTICLES

ARTICLE 1
CONTRACT DOCUMENTS

1.1 DEFINITIONS

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

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

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

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

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

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

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

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

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

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

Contract - Documents.
The "Contract Documents" shall include the Advertisement for Bids, the Instructions for Bidders, the Proposal Form, the Agreement between County and Contractor, the Bid Bond, the Performance Bond, the Payment Bond, these General Conditions, the Special Provisions, the General Requirements, Exhibits, the Technical Specifications, the Contract drawings and plans, all duly issued Addenda, Modifications, Interpretations, and Change Orders, Supplemental Drawings, the Contractor's Guarantee and Bond, the Construction

Administrative Procedures Manual, the Subcontractor Listing, Preliminary Construction Schedule and the Construction Schedule in its most recently updated and accepted version. A modification is a written amendment to the Agreement signed by both parties.

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

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

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

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

Date of Commencement.
"Date of Commencement" shall have the meaning established in Article 8, subsection 8.1.2.

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

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

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

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

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

First Line Supervision.
"First Line Supervision" shall mean a working foreman or lead craft worker other than the project superintendent.

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

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

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

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

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

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

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

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

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

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

Proposed Change Order (PCO).
A "Proposed Change Order (PCO)" is the name given to a document issued by the Construction Manager

authorizing work to proceed on a change in anticipation of approval and issuance by the County of a Change Order.

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

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

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

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

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

Site.
"Site" is the area within which the Project is to be constructed.

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

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

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

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

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

"Subcontractor" shall include all persons or firms within the authority of the Subletting and Subcontracting Fair Practices Act, Chapter 2 of Division 5, Title I of the Public Contract Code, commencing with Section 4100.

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

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

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

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

1.1.1 **THE CONTRACT DOCUMENTS**

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

1.1.2 **THE CONTRACT**

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

1.1.3 **THE WORK**

The Work comprises the completed construction required of the Contractor by the Contract Documents, and includes all labor, materials, equipment and services necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction for the Tulare County –Transit Operations and Maintenance Facility Project, Visalia, CA.

1.1.4 **THE PROJECT**

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

1.2 EXECUTION, CORRELATION, AND INTENT

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

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

The following failures are not waiveable and will cause a bid to be considered non-responsive:

- Failure to sign the bid
- Failure to furnish the required bid bond on the County form provided, or a cashier's check in an amount equal to 10% of the Bidder's base bid
- Failure to include a total amount of the bid
- Failure to submit a completed addenda certification statement
- Failure to be named on the official County planholders list
- Failure to submit and sign the required DBE documentation

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

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

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

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

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

representing the protesting bidder if different from the protesting bidder.

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

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

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

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

G. Right to Award. The County Board of Supervisors reserves the right to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a notice to proceed with the Work notwithstanding any pending or continuing challenge to its determination.
The Contractor shall file with the signed Contract two bonds. These bonds shall be in the amount and for the purposes specified below. They shall be surety bonds and shall be issued by corporations duly and legally licensed to transact business in the State of California. They shall be maintained by the Contractor, at its expense, during the entire term of the Contract.

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

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

All bonds required, whether Bid Bonds, Performance, Payment or other Bonds, shall be issued by a California admitted surety insurer. The Bid Bond, Performance Bond and Payment Bond must be issued by the same admitted surety insurer. The Payment and Performance Bonds required by these specifications will neither be accepted nor approved by the County unless bonds are in the forms shown in Sections 502 and 503 of

the specifications and are underwritten by an admitted surety. The County further reserves the right to satisfy itself as to the acceptability of the surety and the form of bond. The Bidder may be required to submit the following documents:

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

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

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

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

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

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

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

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

1.2.6 Where on any Drawing a portion of the Work is drawn out and the remainder is indicated in outline, the drawn-out parts shall apply to all other like portions of the Work. Where ornament or other detail is indicated as starting, such detail shall be continued

throughout the courses or parts in which it occurs and shall also apply to other similar parts in the Work, unless otherwise indicated.

1.2.7 Scale drawings, full-size details, and specifications are intended to be fully coordinated and to agree. Where not specifically stated otherwise, all work and materials necessary for each unit of construction, even though only briefly mentioned or indicated, shall be furnished and installed fully and completely, including, but not limited to, the manufacturer's instructions and/or recommendations, as part of this Contract.

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

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

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

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

1.2.12 When the Contractor does not agree that work due to an interpretation or supplemental drawing or instruction is within the scope of the Contract Documents, the Contractor shall nevertheless perform such work without delay as directed in writing by the Construction Manager. Within seven (7) days after receipt of the interpretation or instruction, the Contractor shall submit a change order request to the Construction Manager specifying in detail in what particulars the Contract requirements were

exceeded and the change in cost resulting there from. The Construction Manager as well as USDA shall then determine whether a Change Order shall be issued in accordance with Article 12 of these General Conditions.

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

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

1.3 OWNERSHIP AND USE OF DOCUMENTS

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

ARTICLE 2
ADMINISTRATION OF THE CONTRACT

2.1 THE PROJECT ENGINEER

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

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

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

2.1.4 The Contractor shall deliver all correspondence relating to the proper execution of the Work to the Construction Manager, with a copy delivered to the Project Engineer. The Construction Manager reserves the right to consult with the Project Engineer prior to

responding to the Contractor's correspondence.

2.1.5 When discussions between the Contractor and the Construction Manager occur either on the site or elsewhere, but the Project Engineer is not present, the Construction Manager reserves the right to consult with the Project Engineer prior to issuing his/her final decision or instructions.

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

2.2 THE CONSTRUCTION MANAGER

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

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

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

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

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

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

2.2.7 The Construction Manager will be the initial interpreter of the requirements of the Contract Documents and the initial judge of the performance thereunder by the

Contractor.

2.2.8 The Construction Manager will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with agreed upon time limits. Either party to the Contract may make written request to the Construction Manager for such interpretations.

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

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

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

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

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

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

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

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

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

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

ARTICLE 3
COUNTY

3.1 DEFINITION

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

3.2 INFORMATION AND SERVICES REQUIRED OF THE COUNTY

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

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

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

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

3.2.5 The foregoing are in addition to other duties and responsibilities of the County enumerated herein and especially those with respect to Work By County or By Separate Contractors, Payments and Completion, and Insurance in Articles 7, 10 and 12, respectively.

3.3 COUNTY'S RIGHT TO STOP THE WORK

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

3.4 COUNTY'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, and fails within three (3) days after receipt of written notice from the County to correct such default or neglect with diligence and promptness, the

County may, after an additional written notice and without prejudice to any other remedy the County may have, make good such deficiencies, and may further elect to complete that portion of the Work through such means as the County may select, including the use of a new contractor. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the additional services of the Construction Manager, Engineer or other Professionals made necessary by such default, neglect or failure. Such action by the County and the amount charged to the Contractor are both subject to review by the Construction Manager. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the County.

ARTICLE 4
CONTRACTOR

4.1 DEFINITION

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

4.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS

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

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

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

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

4.2.5 Before submitting any Request for Information (RFI), or other Contractor- initiated request for information the Contractor shall determine that the information requested is not clearly provided in the Contract Documents. RFI submittals shall be submitted to the Construction Manager only from the Contractor, or County, and not from any subcontractor, supplier or other vendor, and shall be on a form approved by the Construction Manager and County. The Contractor shall provide a revised and updated RFI Priority Schedule on not less than a weekly basis. The RFI Priority Schedule shall rank RFI's in order of priority and include a brief

statement of reason for priority. County-initiated RFI's will not be listed on the Contractor's RFI Priority Schedule. The County will provide the Construction Manager a separate list of County initiated RFI's upon request of the Construction Manager. The Construction Manager will endeavor to respect the order of priorities as requested by the Contractor or County for the overall benefit of the Project. The RFI process is for information and clarification only and may not be utilized to obtain approval for changes in the Work.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

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

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

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

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

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

4.4 LABOR AND MATERIALS

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

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

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

4.4.4 The Contractor, immediately upon Notice to Proceed (or where shop drawings, samples, etc., are required, immediately upon receipt of approval thereof) shall place orders for all materials, work fabrication, and/or equipment to be employed by him or her in that portion of the Work contracted for. The Contractor shall keep all materials, work

fabrications and/or equipment specified and shall advise the Construction Manager promptly, in writing, of all orders placed and of such materials, work fabrications and/or equipment which may not be available in a timely manner for the purposes of the Contract.

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

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

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

4.5 WARRANTY

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

4.6 TAXES

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

4.7 PERMITS, FEES, AND NOTICES

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

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

4.7.3 If the Contractor observes that any of the Contract Documents are at variance

therewith in any respect, the Contractor shall promptly notify the County in writing, and any necessary changes shall be accomplished by appropriate modification.

4.7.4 If the Contractor performs any Work contrary to any laws, ordinances, rules and regulations, without notice to the Construction Manager, the Contractor shall assume full responsibility therefore and shall bear all costs attributable thereto.

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

4.8 ALLOWANCES

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

4.8.2 Unless otherwise provided in the Contract Documents:

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

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

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

4.9 SUPERINTENDENT

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

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

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

Documents. This provision shall not limit any right or remedy of County in the event of any other default of Contractor.

4.10 CONTRACTOR'S CONSTRUCTION SCHEDULE

4.10.1 Contract Schedule Development

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

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

A. Format: a time scaled CPM schedule.

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

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

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

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

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

G. Dependencies (or relationships) between activities shown.

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

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

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

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

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

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

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

O. Material or equipment description.

P. Technical specification reference.

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

R. Duration in days required for fabrication and delivery.

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

T. Scheduled delivery dates.

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

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

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

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

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

Monthly Updates

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Failure of the Contractor to comply with the requirements of "Short Interval Schedules"

shall be considered grounds for a determination by the County, pursuant to Article 14, that the Contractor is failing to prosecute the Work with such diligence as will ensure its completion within the time specified.

Daily Reports

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

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

4.11 RECORDS, DOCUMENTS AND SAMPLES AT THE SITE

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

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

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

4.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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

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

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

4.12.4 The Contractor, at its sole cost and expense, shall furnish to the Construction Manager all drawings and other descriptive material as are required by the specifications or requested by the Engineer. Shop drawings shall be done with sufficient detail to adequately describe items proposed to be furnished or methods of installation to enable the County and Engineer to determine compliance with the specifications and with the design and arrangement shown on the working drawings. The Construction Manager will not accept shop drawings or manufacturers' instructions which are not

sufficiently dimensioned and detailed to demonstrate compliance with the Contract Documents.

The Contractor shall check and coordinate all submittals with the work of all trades involved before they are submitted.

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

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

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

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

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

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

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

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

FAILURE BY THE CONTRACTOR TO IDENTIFY IN ITS LETTER OF TRANSMITTAL ANY VARIATION, DISCREPANCY, OR CONFLICT WITH THE CONTRACT DOCUMENTS SHALL RENDER THE

APPROVAL NULL AND VOID, AND THE CONTRACTOR SHALL BEAR ALL RISK OF LOSS AND RECONSTRUCTION COSTS OR DELAYS.

If any architectural, plumbing, mechanical, electrical, or structural modifications are required as a result of the approval of shop drawings or manufacturers' instructions which deviate from or do not comply with the Contract Documents, those modifications shall be made without extra cost to the County, and without extension of the Contract Time. Any other resultant costs, including but not limited to design fees, Construction Management fees, cost incurred by other contractors, or inspection fees, shall be at the expense of the Contractor.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.12.17 Brochures: Following Contractor's review and approval, he or she shall submit to the Construction Manager, six (6) copies of all manufacturer's catalogs or brochures as required. If a brochure is stamped "No Exception Taken", two (2) copies will be returned

to the Contractor. If stamped "Rejected", one marked copy and two (2) unmarked copies will be returned. Corrected copies shall be resubmitted for approval as per the original submittal.

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

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

4.13 USE OF SITE

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

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

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

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

4.14 CUTTING AND PATCHING OF WORK

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

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

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

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

4.15 CLEANING UP

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

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

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

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

4.15.3 Final Cleaning of Project

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

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

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

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

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

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

4.16 **ROYALTIES AND PATENTS**

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

4.17 **INDEMNIFICATION AND DEFENSE**

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

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

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

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

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

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

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

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

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

4.18 FAIR EMPLOYMENT PRACTICES CLAUSE

4.18.1 Nondiscrimination: In connection with the performance of Work under the Contract, the Contractor agrees (as prescribed in Chapter 6 of Division 3 of Title II of the

Government Code of the State of California, Commencing at Section 12900 and by Labor Code Section 1735) not to discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status or sex. The aforesaid provisions shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post hereafter in conspicuous places, available for employees and applicants for employment, Notices to be provided by the County, setting forth the provisions of this discrimination clause. The Contractor further agrees to insert the foregoing provisions in all subcontracts hereunder, except subcontracts for standard commercial supplies of raw materials.

ARTICLE 5
SUBCONTRACTORS

5.1 **DEFINITION**

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

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

5.2 **AWARDS OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK**

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

5.3 **SUBCONTRACTUAL RELATIONS**

5.3.1 By an appropriate agreement, written where legally required for enforceability, the Contractor shall require each Subcontractor, to the extent of the work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the County, the Engineer and the Construction Manager. Said agreement shall preserve and protect the rights of the County, the Engineer and the Construction Manager under the Contract Documents with respect to the work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor Agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Documents, has against the County. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with their Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 6.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to their Sub-

subcontractors. Nothing contained herein shall be deemed to create an agency relationship between the County and any Subcontractor or material supplier.

5.3.2 The substitution or addition of Subcontractors shall be permitted only as authorized by Public Contracts Code Section 4100, et. seq. The Subcontractors employed by the Contractor shall be appropriately licensed in conformity with the laws of the State of California. Should the Contractor violate any of the provisions of this Section, the violation shall be deemed a breach of this Contract and the County shall have all remedies provided by California law, including but not limited to those provided in Public Contract Code Section 4100, allowing termination of the Contract or a penalty assessment of ten percent (10%) of the subcontract amount.

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

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

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

ARTICLE 6
WORK BY COUNTY OR BY SEPARATE CONTRACTORS

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

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

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

6.1.3 The County shall provide for coordination of the activities of the County's own forces and of each separate contractor with the work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the County in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary

after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the County until subsequently revised.

6.1.4 Unless otherwise provided in the Contract Documents, when the County performs construction or operations related to the Project with the County's own forces, the County shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract including, without excluding others, those stated in Article 4, this Article 6 and Articles 10, and 13.

6.2 MUTUAL RESPONSIBILITY

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

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

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

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

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

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

6.3 COUNTY'S RIGHT TO CLEAN UP

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

ARTICLE 7
MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

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

7.2 SUCCESSORS AND ASSIGNS

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

7.3 WRITTEN NOTICE

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

COUNTY:

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

PROJECT CONSULTANT:
Kyle Swanson
Arrington Watkins Architects
5240 N. 16th Street Suite 101
Phoenix, AZ 85016
602-279-4373 – Phone
602-279-9110 - Fax

CONTRACTOR:

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

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

7.4 CLAIM REQUIREMENTS

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

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

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

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

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

By: _____
(Contractor's signature)

Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by Contract for the filing of claims. For any claim subject to this Article 7.4.4, the following requirements apply:

.1 For claims of less than fifty thousand dollars ($50,000), the Tulare County Resource Management Agency's Assistant Director for Public Works shall review the facts

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

.2 For claims of fifty thousand dollars ($50,000) or more, and less than or equal to three hundred seventy-five thousand dollars ($375,000), the Assistant Director for Public Works shall review the facts pertinent to the claim, obtain additional information deemed necessary for a decision (if any), review recommendations of the County's Representative, coordinate with the Contract administrator (if any) and secure assistance from legal and other advisors, and render a written decision on the claim within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the County may have against the claimant. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the Assistant Director for Public Works and the claimant. The Assistant Director for Public Works' written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documents, or a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

.3 If the claimant disputes the written response of the Assistant Director for Public Works fails to respond within the time prescribed, the claimant may so notify the Assistant Director for Public Works, in writing, either within 15 days of receipt of the Assistant Director for Public Works' response or within 15 days of the Assistant Director for Public Works' failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the Assistant Director for Public Works (or his/her designee) shall schedule a meet and confer conference within 30 days for settlement of the dispute.

.4 If following the meet and confer conference the claim or any portion remains in dispute, the claimant may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time the claim is denied, including any period of time utilized by the meet and confer conference.

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

.1 Any claims by the County;
.2 Any claim for or respecting personal injury or death or reimbursement or other compensation arising out of or resulting from liability for personal injury or death;
.3 Any claim or dispute relating to stop payment requests or stop notices; and

.4 Any claim related to the approval, refusal to approve, or substitution of subcontractors, regardless of tier, and suppliers.

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

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

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

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

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

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

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

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

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

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

7.6 RIGHTS AND REMEDIES

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

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

7.7 TESTS AND INSPECTIONS

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

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

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

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

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

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

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

7.7.5 Approval of Samples.
No materials or work of which samples and/or tests are required shall be used or covered until the Construction Manager informs the Contractor that such samples and/or tests have been approved. If the Contractor installs, uses, or covers any such material, article, or work prior to testing and approval, such shall be at the Contractor's

sole risk and expense, and it shall bear all costs of uncovering, repair, and replacement thereof. The approval of any samples shall be for the characteristics thereof, or for the uses named in such approval, and no other. No approval of any samples shall be deemed a change or modification in any requirement of the Contract Documents. Upon testing of any sample of material or work, no additional sample shall be considered. All material or work installed after the sampling and testing is performed and approved shall be equal to or better than the approved sample in all respects.

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

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

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

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

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

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

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

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

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

Upon issuing a stop work notice, the Inspector shall notify the Engineer, who shall inspect the work in question and determine whether it does or does not comply with the Contract Documents. The decision of the Engineer shall be final. The Contractor shall thereafter comply with the instructions of the Engineer regarding corrections needed to cure the defect. The suspended work shall be resumed only when the

instructions are fulfilled. The Contractor shall not be entitled to an extension of time in the event of such suspension of work.

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

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

Should the Construction Manager or the Engineer determine that it is necessary or advisable to make an inspection of work already completed at any time before final inspection and acceptance of the Work, by removing or exposing any work, the Contractor shall, upon instruction of the Construction Manager, promptly furnish all necessary facilities, labor, and materials to do so. If the work is found to be defective in any respect due to the fault of the Contractor or any subcontractor, the Contractor shall bear all expenses of such examination and satisfactory reconstruction. If, however, the work is found to meet the requirements of the Contract Documents, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor and a change order shall be issued for such cost and any time extension justified by delays to the critical path.

Where the Contract Documents, instructions by the Inspector, Construction Manager or the Engineer, laws, ordinances, or any public authority having jurisdiction require work to be inspected, tested or approved before the Work proceeds, such work shall not proceed, nor shall it be covered up without inspection. If any part of the Work is covered prior to inspection, the County may order the work to be uncovered so that inspection may be accomplished. The Contractor shall bear all expenses of such examination and satisfactory reconstruction.

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

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

ARTICLE 8
TIME

8.1. DEFINITIONS

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

8.1.2 The Date of Commencement of the Work is the date established in a Notice to Proceed. If there is no Notice to Proceed, it shall be such other date as may be established in the County-Contractor Agreement and receipt of all required preconstruction submittals, bonds and insurance, or as established elsewhere in the Contract Documents. If a Date of Commencement of the Work is not established in the Notice to Proceed it shall be the date that the Contractor receives the Notice to Proceed.

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

8.1.4 The Date of Substantial Completion of the Project.

.1 The project is to be completed within 180 calendar days

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

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

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

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

Final determination of the final impact of adverse weather may be deferred to the conclusion of the Work. Extensions of time may be requested for any month of construction for days lost, which affect the critical path of construction, due to adverse

weather in excess of the normal weather conditions, as defined above. If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating days claimed and the impact on the critical path of construction.

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

8.2 PROGRESS AND COMPLETION

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

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

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

8.3 DELAYS AND EXTENSIONS OF TIME

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

A. As used herein, the following terms shall have the following meanings:

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

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

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

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

.1 If an Excusable Delay and a Compensable Delay occur concurrently, the

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

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

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

8.3.2 Notice of Delays.

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

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

8.3.3 Investigation; Procedure.

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

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

8.3.4 Discretionary Time Extensions for Best Interest of County.

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

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

8.3.5 Liquidated Damages

If the Work is not completed by the Contractor in the time specified in, or within any period of extension authorized pursuant to this Article, the Contractor acknowledges and admits that the County will suffer damage, and that it is impracticable and infeasible to fix the amount of actual damages. Therefore, it is agreed by and between the Contractor and the County that the Contractor shall pay to the County as fixed and liquidated damages, and not as a penalty, the sum specified in the Agreement for Construction for each calendar day of delay until the Date of Completion, and that both the Contractor and the Contractor's surety shall be liable for the total amount thereof, and that County may deduct Liquidated Damages from any monies due or that may become due to the Contractor. If it appears during the course of construction that the Contractor is behind schedule and the imposition of liquidated damages is likely, or if liquidated damages begin to accrue prior to the time for final payment, the amount accrued shall be withheld from any progress payment that would otherwise be due. This right to withhold funds is intended to complement the County's rights under Section 10.6.1.

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

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

8.3.6 Extension of Time Not a Waiver.

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

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

8.3.7 Suspensions Exceeding One Year.

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

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

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

8.3.8 Effect of Stop Work Notice.

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

ARTICLE 9
PAYMENTS AND COMPLETION

9.1. CONTRACT SUM

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

9.2. SCHEDULE OF VALUES

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

9.3. APPLICATIONS FOR PAYMENT

9.3.1. At least fifteen days before the date for each progress payment established in the County-Contractor Agreement, the Contractor shall submit to the Construction Manager an

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

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

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

9.3.4. The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the County either by incorporation in the construction or upon receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, stop notices, claims, security interest or encumbrances, hereinafter referred to in this Article 10 as "liens"; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

.1 The Contractor agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any work covered by this Contract shall have any right to a lien upon the premises or any improvement or appurtenances thereon; provided, however, that nothing contained in this Section shall defeat or impair the rights of persons furnishing materials or labor under the payment bond given by the Contractor, nor any rights under any law permitting such persons to look to funds due to the Contractor but retained by County.

.2 The Contractor shall cause the provisions of this Section to be inserted in all

subcontracts and material contracts executed by the Contractor and notice of this provision shall be given to all persons furnishing materials for the Work.

.3 This Section shall not disallow the Contractor's installing any devices or equipment of utility companies or of governmental agencies, the title to which is commonly retained by the utility company or the agency.

9.3.5. Progress Payments:

.1 If the County does not pay the Contractor within thirty days after receipt of an undisputed and properly submitted payment request for a progress payment, excluding that portion of the final payment designated by the Contract as retention earnings, then the County shall pay interest to the Contractor as provided by Public Contract Code § 20104.50. Payment for Change Orders, if any, under this Contract shall be made in like manner. Said interest penalty is the sole recourse of Contractor and Contractor shall have no right to stop the Work until payment of the amount owing has been received, nor shall the Contract Time be extended, nor shall the Contract Sum be increased in any way, including by reason of any costs incurred by Contractor, except to the extent of said interest payment.

.2 Pursuant to Public Contract Code § 7107, in the event of a dispute between the County and Contractor, the County may withhold from the final payment an amount not to exceed 150 percent of the disputed amount. Except as so provided, the County shall release the retention withheld within 60 days after the date of completion of the work of improvement, as "completion" is defined in Public Contract Code § 7107. In the event that retention payments are not made within the time periods required by Public Contract Code § 7107, the County may be subject to the interest provisions of Public Contract Code § 7107.

9.3.6. Refuge Substitutions and Escrow for Moneys Withheld to Insure Contractor's Performance. Pursuant to Public Contract Code § 22300, the Contractor may deposit in an escrow, equivalent securities for any moneys withheld to insure performance and have said moneys paid directly to Contractor, or, in the alternative, have the County deposit such moneys directly into an escrow. Upon the closing of any such escrow, Contractor shall pay to each subcontractor, not later than 20 days after receipt of the closing payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the Contractor. Any escrow established pursuant to this article shall be with a state or federally chartered bank, shall be at the sole expense of the Contractor, and shall be established using an escrow agreement in substantially the following form:

ESCROW AGREEMENT FOR
SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the County of Tulare, (hereinafter called "County"),_____ (hereinafter called "Contractor"); and _____ _____, a state or federally chartered bank in California, (hereinafter called "Escrow Agent").

For the consideration hereinafter set forth, the County, Contractor, and Escrow Agent agree as follows:

1. Pursuant to Section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by County pursuant to the Construction Contract entered into between the County and Contractor for _____ in the amount of $_____, and dated _____ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the County shall make payments of the retention earnings directly to the escrow agent. When Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the County within ten (10) days of the deposit. The market value of the securities at the time of the substitution, as valued by the County, shall be at least equal to the cumulative total cash amount then required to be withheld as retention under the terms of the Contract between County and Contractor. If the County determines that the securities are not adequate it will notify Contractor and Escrow Agent, and Contractor shall deposit additional security as further determined by the County. Securities shall be held in the name of the County and shall designate the Contractor as the beneficial owner.

2. Upon the deposit of adequate securities, County shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions.

3. When the County, at Contractor's written request, makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as the escrow created under this Contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the County pays the escrow agent directly.

4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the County. These expenses and payment terms shall be determined by the County, Contractor, and Escrow Agent.

5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the County.

6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from County to the Escrow Agent that County consents to the withdrawal of the amount sought to be withdrawn by Contractor.

7. The County shall have the right to draw upon the securities or any amount paid directly to Escrow Agent in the event of default by the Contractor. Upon seven (7) days written notice to the Escrow Agent from the County of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash, including any amounts paid directly to Escrow Agent, as instructed by the County. Escrow Agent shall not be concerned with the validity of any notice of default given by County pursuant to this paragraph, and shall promptly comply with County's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to conflicting demands and hereby waives any present or future right of interpleader.

8. Upon receipt of written notification from the County certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payment of fees and charges.

9. Escrow Agent shall rely on the written notifications from the County and Contractor pursuant to Sections (3), (5), (6), (7) and (8) of this Escrow Agreement and the County and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

10. Securities eligible for investment under this Escrow Agreement, as provided by Public Contract Code § 22300, shall be those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and County.

11. The venue of any litigation concerning the rights and obligations of the parties to this Escrow Agreement shall be the County of Tulare and the removal provisions of Code of Civil Procedure Section 394 shall not apply to any such litigation.

12. The names of the persons who are authorized to give written notice or to receive written notice on behalf of the County and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of County:

Title
Name
Signature
Address

On behalf of Contractor:

Title
Name
Signature
Address

On behalf of Escrow Agent:

Title
Name
Signature
Address

At the time the Escrow Account is opened, the County and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Escrow Agreement.

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

County:

Title
Name
Signature
Address

Contractor:

Title
Name
Signature
Address

Escrow Agent:

Title
Name
Signature
Address

Either alternative under this Section may be exercised only if requested in writing by the Contractor within five (5) days after receipt of Notice of Intent to Award. The Contractor shall notify its subcontractors in writing within fifteen (15) days of exercising this option.

9.3.7 Itemized Breakdown: The Contractor shall submit a financial breakdown of the work, itemized by crafts or sections as designated by the Construction Manager. The Contractor's payment shall be based upon the monthly percentage of completion of these items.

9.3.8 Lien Waivers: The County or Construction Manager may require the Contractor to submit, along with the progress payment request, notarized lien waivers from each subcontractor, materials or equipment supplier. Lien waivers shall comply with Civil Code § 3262. The aggregate sum of which shall reflect previous progress payments.

9.4. **CERTIFICATES FOR PAYMENT**

9.4.1. The Construction Manager will, within seven days after the receipt of the Project Application for Payment, review the Project Application for Payment and either issue a Project Certificate for Payment to the County for such amounts as the Construction Manager determines are properly due, or notify the Contractor in writing of the reasons for withholding a Certificate as provided in Subparagraph 9.6.1. The application for payment shall be made on AIA Documents G702 and G703 of the latest edition, in triplicate.

9.4.2. The issuance of a Project Certificate for Payment will constitute a representation by the Construction Manager, Engineer and Inspector to the County that, based on their observations at the site as provided in Subparagraph 2.2.4 and the data comprising the Project Application for Payment, the Work has progressed to the point indicated; that, to the best of the Construction Manager's, Engineer's and Inspector's knowledge, information and belief, the quality and timeliness of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion of the Work, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in the Certificate); and that the Contractor is entitled to payment in the amount certified. However, by issuing a Project Certificate for Payment, the Construction Manager, Engineer and Inspector shall not thereby be deemed to represent that they have made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, have reviewed the construction means, methods, techniques, sequences or procedures, or have made any examination to ascertain how or for what purpose the Contractor has used the monies previously paid on account of the Contract Sum.

9.5. **PROGRESS PAYMENTS**

9.5.1. After the Construction Manager has issued a Project Certificate for Payment, the County shall make payment in the manner and within the time provided in the Contract Documents.

9.5.2. The Contractor shall promptly pay each Subcontractor upon receipt of payment from the County, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contract on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with

each Subcontractor, require each Subcontractor to make payments to their Sub-subcontractors in similar manner.

9.5.3. The Construction Manager may on request, at the Construction Manager's discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Construction Manager on account of Work done by such Subcontractor.

9.5.4. Neither the County nor the Construction Manager shall have any obligation to pay or to see to the payment of any monies to any Subcontractor or Material Suppliers except as may otherwise be required by law.

9.5.5. Neither certification of a progress payment, delivery of a progress payment, nor partial or entire use or occupancy of the Project by the County, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

9.6. PAYMENTS WITHHELD

9.6.1. The Construction Manager may decline to certify payment and may withhold the Certificate in whole or in part to the extent necessary to reasonably protect the County, if, in the Construction Manager's opinion, the Construction Manager is unable to make representations to the County as provided in Subparagraph 9.4.2 . If the Construction Manager is unable to make representations to the County as provided in Subparagraph 9.4.2, and to certify payment in the amount of the Project Application, the Construction Manager will notify the Contractor as provided in Subparagraph 9.4.1. If the Contractor and the Construction Manager cannot agree on a revised amount, the Construction Manager will promptly issue a Project Certificate for Payment for the amount for which the Construction Manager is able to make such representations to the County. The Construction Manager may also decline to certify payment or, because of subsequently discovered evidence or subsequent observations, the Construction Manager may nullify the whole or any part of any Project Certificate for Payment previously issued to such extent as may be necessary, in the Engineer's opinion, to protect the County from loss because of:

.1 defective Work not remedied;

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

.3 failure of the Contractor to make payments properly to Subcontractors, or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the County or another contractor;

.6 reasonable evidence that the Work will not be accomplished in compliance with the Contract Time;

.7 persistent failure to carry out the Work in accordance with the Contract Documents; or stop notice served upon the County.

.8 Failure of the Contractor to comply with any lawful or proper direction concerning the Work given by any County representative authorized to have given such instruction;

.9 Claims and/or penalties which state law assesses against the Contractor for violation of such law;

.10 Any claim or penalty asserted against the County by virtue of the Contractor's failure to comply with the provisions of all governing laws, ordinances, regulations, rules, and orders;

.11 Any liquidated damages which may accrue as a result of the Contractor's

progress failing to meet the schedule milestones or failing to achieve completion within the Contract Time.

.12 Any reason specified elsewhere in the Contract Documents as grounds for a retention or that would legally entitle the County to a withhold.

9.6.2. When the grounds in Subparagraph 9.6.1 above are removed, payment shall be made for amounts withheld because of them.

In order to adequately protect the County, the Contractor agrees that the basic standard to determine the amount to be withheld pursuant to this Section shall be one hundred fifty percent (150%) of the amounts claimed or the value of the work not done or defectively done; provided, however, that County reserves the authority to retain greater sums should such sums be necessary in the County's discretion to adequately protect it.

Disbursement of Withheld Amounts.
The County, in its sole discretion, may apply any withheld amount or amounts to the payment of any claim resulting in a withhold. The Contractor agrees and hereby designates the County as its agent for such purposes, and any payment so made by the County shall be considered as a payment made under this Contract by the County to the Contractor. The County shall not be liable to the Contractor for any payments made in good faith. Such payments may be made without a prior judicial determination of the claim or claims. The County shall render to the Contractor a proper accounting of any funds disbursed on behalf of the Contractor.

Prior to disbursing any amounts, County shall afford the Contractor an opportunity to present good cause, if any it has, why the claim or claims in issue are not valid or just claims against the Contractor. The County reserves the right then to take such further steps as are appropriate, in its sole discretion, including, but not limited to, seeking a judicial resolution of the controversy.

Correction of Statement and Withholding of Payment.
No inaccuracy or error in any statement provided by the Contractor shall operate to release the Contractor or any surety from the error, or from damages arising from such work, or from any obligation imposed by the Contract Documents. The County shall retain the right subsequently to correct any error made in any previously issued claim for the progress payment, or progress payment issued, by adjustments to subsequent payments.

Effect of Progress Payments.
Neither the payment, the withholding, nor the retention of all or any portion of any progress payment claimed to be due and owing to the Contractor shall operate in any way to relieve the Contractor from its obligations under this Agreement. The Contractor shall continue diligently to prosecute the Work without reference to the payment, withhold, or retention of any progress payment. The payment, withhold, or retention of any progress payment shall not be grounds for an extension of the Contract Time.

9.7 SUBSTANTIAL COMPLETION, INSPECTION, AND OCCUPANCY BY COUNTY

9.7.1. Notice of Punch List Inspection.
When the Contractor believes that a phase of its Work is complete, it shall request in writing a punch list inspection. Within five (5) days of the receipt of such request, the Construction Manager and the Engineer shall make a punch list inspection or inform the Contractor that the work is not ready for punch list inspection; upon completion of the deficient work, the Contractor shall again request a punch list inspection. The Contractor or its representatives shall be present at the punch list inspection. The purpose of the punch list inspection is to

determine whether the Work has been completed in accordance with the Contract Documents, including all Change Orders, all interpretations and instructions previously issued.

If Contractor fails to attend any punch list inspection, the Contractor shall be charged for the cost of the Construction Manager, Engineer, the Inspector, and other design professionals who attended the punch list inspection.

Punch List.
The Construction Manager and the Engineer shall notify the Contractor in writing of any deficiencies to be remedied prior to final acceptance, by preparing a written list, known in the industry as a punch list.

The Contractor shall remedy all items shown on the punch list prior to final acceptance by the Construction Manager and the Engineer.

No one is authorized to amend the Contract Documents by use of the punch list; it is provided solely for the benefit of the Contractor to enable him to determine what items must be corrected before final acceptance will be recommended by the Construction Manager and the Engineer. The County reserves the right to require compliance with the Contract Documents, notwithstanding the issuance of a punch list or the completion by the Contractor of all items on the punch list.

In the event that the Work still does not comply with the Contract Documents, the County reserves the right to issue such further punch lists as may be required, or to deduct from the final payment the cost of correcting any work not completed in accordance with the Contract Documents, but accepted by the County, without the issuance of further punch lists.

If punch list work needs to be performed after the County has taken occupancy of a phase, the work shall be conducted outside of normal operating hours at the direction of the Construction Manager.

9.7.2. Use of Work Prior to Acceptance. Whenever, in the opinion of the County, the Work or any part thereof, is in a condition suitable for use, and the best interests of the County require such use, the County may take possession of, connect to, and open for public or County use that portion of the Work.

9.7.3. Repairs or Renewal in the Work.Prior to the Date of Completion, the Contractor shall make all repairs or renewals in the portion of the Work occupied made necessary due to defective material or workmanship, or the operations of the Contractor, ordinary wear and tear accepted.

9.7.4. Effect of Occupancy.
The County occupancy as contemplated in this Article shall not constitute acceptance by the County of the Work or any part thereof. Such use shall neither relieve the Contractor of any of its responsibilities under the Contract Documents, nor act as a waiver by the County of any of the terms or conditions of the Contract Documents. Any damage done by the County is the responsibility of the County.

9.7.5. Coordination with Other Activities.
The Contractor shall conduct its operations so as not to interfere unreasonably with the County's use of the occupied portions of the site. The Contractor shall submit periodic schedules to the Construction Manager proposing the times, areas, and types of work to be done within such areas.

If the work produces conditions rendering the occupied portions of building, the Site, or other areas uninhabitable, either because of noise, dust, vibration, smoke, fumes, or for any other cause whatsoever, the Construction Manager may suspend the Work or direct the Contractor to modify the Construction Schedule, and the Contractor shall comply.

Except as provided by Change Order, the Contractor shall not be entitled to a time extension or increase in the Contract Sum by virtue of conflicts between the Contractor's work and the County's occupancy.

9.7.6. Warranties required by the Contract Documents shall commence on the date of the recording of the Notice of Completion on the Project.

9.8 FINAL COMPLETION, CONTRACT CLOSEOUT AND FINAL PAYMENT

9.8.1. Contractor's Request for Final Payment. When the Contractor determines that the Contract is complete and all items on the punch list have been satisfied, or contends that such items are not required by the Contract Documents, the Contractor shall submit a request for final payment.

9.8.2. Additional Submissions. Simultaneously with the Contractor's request for final payment, the Contractor shall submit the following items to the Construction Manager:

.1 As-built drawing information pursuant to Section 4.11.3.

.2 Three (3) sets of documentation completely covering the operation and maintenance of the mechanical and electrical installation, elevators, kitchen equipment, and all other equipment required by the technical specifications to be furnished with such manuals. The documentation shall include charts, diagrams, performance curves, catalog information, lubrication manuals, and details pertaining to the functioning of various items of equipment. The documentation shall be divided logically into "systems" on the basis of operation, without respect to trades, subcontractors or arbitrary specifications sections. The relationship of the "systems" shall be clearly and concisely detailed.

No payment will be processed unless accompanied by the listed documents in acceptable form.

Final Estimate.

Upon receipt of the submittals required by this Article, the Construction Manager shall prepare a written estimate of the sum due to the Contractor. This estimate shall take into account the Contract Sum, as adjusted by any Change Orders; amounts already paid; and sums to be retained for incomplete work and for any other cause under the Contract Documents.

The Engineer shall prepare a statement of final inspection, stating that the Work has been given a final inspection, that the Contractor has submitted the required documents, setting forth with detail any deviations in the Work as completed from the Contract Documents, and estimating the cost of correction of such deviations.

The Engineer's statement shall be transmitted to the County along with the Contractor's request for final payment. The Construction Manager shall provide a copy of the Engineer's statement of final inspection and the Construction Manager's estimate of the sum due to the Contractor.

If the Contractor contests the estimate of sums due prepared by the Construction Manager,

within seven (7) calendar days following service of Construction Manager's estimate of the sum due, the Contractor shall file its protest in writing with the County, setting forth in detail all grounds alleged by it to justify an adjustment to the Construction Manager's final estimate. Failure to file a timely protest shall constitute a waiver and acceptance by the Contractor of the Construction Manager's estimate.

Notice of Completion and Acceptance of Contract.
Acceptance of the Work by the County and the recordation of a Notice of Completion shall be in the manner prescribed by law, provided that the Work shall then be fully and satisfactorily completed and the provisions of the Contract Documents fully and satisfactorily performed in all respects.

Certificate of Final Payment.
Within ten (10) days after the recordation of the Notice of Completion, the County shall present a certificate of final payment stating the entire balance found to be due the Contractor. The amount set forth in that certificate shall then be due and payable, less retentions due to stop notices.

Approval of Final Payment.
Following receipt of the certificate of final payment by the County, the County shall authorize final payment to the Contractor in the sum specified on the certificate of final payment, subject to retentions for stop notices as provided in Article 14. Final payment shall be made within sixty (60) days after recordation of the Notice of Completion and in accordance with Public Contract Code Section 7107.

Withholding for Stop Notices.
The County may, in its sole discretion, and at any time, withhold from the Contractor any unpaid claims alleged in Stop Notices filed pursuant to Civil Code Section 3179 et seq. The County reserves all remedies it may have in the event of a stop notice dispute. The basic standard to determine a sufficient withholding in the event of a Stop Notice shall be one hundred fifty percent (150%) of the total of all stop notices filed; provided, however, the County reserves the right to withhold different or greater sums in its discretion.

Non-Waiver.
Neither acceptance of, nor payment for, the Work or any part thereof, nor any extension of time, nor any possession taken by County shall operate as a waiver of any of the provisions of this Contract, nor shall a waiver of any breach of this Contract be held to be a waiver of any other or subsequent breach. In addition, recordation of a Notice of Completion shall not be deemed an acceptance of latent defects, nor shall it constitute a waiver of any of the provisions of this Agreement.

9.8.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by the issuance of Change Orders affecting final completion, and the Construction Manager so confirms, the County shall, upon application by the Contractor and certification by the Construction Manager and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Construction Manager prior to certification of such payment. Such payment shall be made under the Terms and Conditions governing final payments, except that it shall not constitute a waiver of claims. AIA Documents G707, Consent of Surety Company to Final Payment or if appropriate G707-A, Consent of Surety

to Reduction in or Partial Release of Retainage, shall be used.

9.8.4 The acceptance of final payment shall, after the Date of Substantial Completion of the Project, constitute a waiver of all claims by the Contractor.

9.8.5 All provisions of this Agreement, including without limitation those establishing obligations and procedures, shall remain in full force and effect notwithstanding the making or acceptance of final payment.

ARTICLE 10
PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The responsibility for maintaining a safe working site shall be the Contractor's, and the County and Construction Manager undertake no obligation to suspend the work or notify the Contractor of any hazardous conditions or noncompliance with safety laws.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

.1 all employees on the Work and all other persons who may be affected thereby;

.2 all the work and all materials and equipment to be incorporated therein, whether in storage or off the site, under the care, custody or control of the Contractor or any of the Contractor's Subcontractors or Sub-subcontractors;

.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and

.4 the work of the County or other separate contractors.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and the progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying County and users of adjacent facilities. The Contractor shall enforce any instructions from the Construction Manager or County regarding placement of signs, fires, danger signals, barricades, radios, noise and smoking.

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy all damage or loss to any property referred to in Clauses 10.2.1.2. and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, anyone directly or indirectly employed by any of them, or any one for whose acts any of them may be liable, and for which the Contractor is responsible under Clauses 10.2.1.2 and section 10.2.1 subsection iii , except damage or loss attributable solely to the acts or omissions of the County, the Construction Manager, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 4.17 .

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the County and the Construction Manager.

10.2.7 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.2.8 Traffic Signs and Traffic Control

.1 Existing signs, lights, traffic signals, control boxes, hydrants, meters, and other similar items occurring within the street or sidewalk areas shall be kept free of obstructions and accessible at all times. All such items shall be protected from the Contractor's operations and shall not be obliterated or obscured by its equipment or materials.

.2 Should it be necessary to cover up, move, or alter such items, this shall be done only with permission of the authorities having jurisdiction over the items involved.

.3 Should it be necessary to block a street or sidewalk, the Contractor shall first notify the Construction Manager and the police and fire departments and other agencies with jurisdiction, and shall comply with their instructions, including scheduling limitations.

10.2.9 Security of the Site.

.1 The Contractor's attention is directed to Specifications Section 01500 (if applicable) regarding requirements for fencing the Site, gates, and screening. The Contractor's attention is further directed to the security requirements in the Construction Administrative Procedures Manual.

10.2.10 Removal of Barricades.

.1 Upon completion of the Work, the Contractor shall remove from the site all materials used for barricades, temporary scaffolding, or any other temporary uses.

10.2.11 Protection of Adjacent Property; Notices.

.1 In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin, and protect as may be necessary all foundations and other parts of all existing structures on the Site or adjacent to the Site which are in any way affected by the excavations or other operations connected with the completion of the Work.

.2 Prior to excavation, the Contractor shall notify all public utilities and governmental agencies of the work proposed, and shall ascertain from them the exact location of their utilities.

.3 Prior to commencing any work which in any way affects adjoining or adjacent land or buildings thereon, or public utilities, the Contractor shall notify the Construction Manager, who will send the County and occupants thereof a notice, which specifies the type of work to be done, the schedule of the work, the impacts expected from the work and the protective measures being taken by the Contractor. The notice shall also specify that any person receiving notice who has questions regarding it may contact the Construction Manager.

.4 Whenever any notice is required to be given to any adjoining or adjacent landowner, utility, governmental agency or other party before commencement of any work, the notice shall be given by the Contractor at least seven days in advance of the work, or longer if required by law or regulation, with a copy delivered to the Construction Manager.

.5 The Contractor shall, at the written instruction of the Construction Manager, meet with any recipient of such notice to explain and discuss the proposed work.

10.2.12 Fire Protection.

.1 The Contractor shall take all steps necessary to protect all structures from fires and sparks originating from the Work, shall comply with all laws and regulations regarding fire protection, and shall comply with all instructions of the fire department with jurisdiction.

.2 The Contractor shall notify the Construction Manager and the fire department in writing at least 72 hours prior to disconnection of either water or electrical service to the site, and shall comply with the fire department's instructions regarding fire safety.

10.2.13 Valley Fever

.1 Coccidioidomycosis, also known as "Valley Fever" or "cocci", is a disease caused by Coccidoides fungi which infect the lungs. When the fungus spores present in soil are disturbed, the spores may become airborne and can be inhaled. Contractor is hereby notified that the spores which cause Valley Fever are endemic to Tulare County. Activities which disturb soil or expose workers to dust, such as digging, operating earth-moving equipment, driving vehicles, and working in wind-blown areas, may increase the risk of Valley Fever in workers. Information regarding preventing and recognizing the symptoms of Valley Fever are available from the California Department of Public Health and the California Department of Industrial Relations. The provisions of this section shall be made a part of every subcontract executed pursuant to this Contract.

10.2.14 Repairs or Replacement.

.1 Any damage to existing conditions, or to any other improvement or property above or below the surface of the ground, whether private or public, arising from performance of this Contract shall be repaired within 48 hours by the Contractor without expense to the County, unless disruption of existing facility operations or creation of a safety hazard has occurred, in which case damage will be corrected immediately.

.2 If, in the opinion of the Engineer, the best interest of the County requires that repairs be made prior to the execution of any further work, the Construction Manager will so notify the Contractor who shall delay or discontinue that part of the Work until the necessary repair has been made. Such delay shall not be considered unavoidable and no extension of the Contract Time will be granted therefore.

.3 Upon the failure of the Contractor to comply with any such order, or upon the Contractor's failure to make immediate emergency repairs which are necessary to protect the Work, the County shall do that work itself as is necessary to protect life and property, in its sole discretion, and deduct the total cost of such work from the next progress payment. No prior notice to the Contractor shall be necessary for the County to take this action.

10.3 **EMERGENCIES**

10.3.1 In any emergency affecting the safety of persons or property, including adjoining property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. The Contractor shall immediately notify the Construction Manager of such actions. Any costs to the Contractor for expenditures or time shall be borne by the Contractor.

ARTICLE 11
INSURANCE

11.1 **CONTRACTOR'S INSURANCE**

11.1.1 Bidders and their subcontractors attention is directed to the insurance requirements below. It is highly recommended that Bidders confer with their respective insurance carriers or brokers to determine in advance of bid submission the availability of insurance certificates and endorsements as prescribed and provided herein. If an apparent low bidder fails to comply strictly with the insurance requirements, that Bidder may be disqualified from award of the Contract and forfeits its Bid Bond.

11.1.2 Contractor and subcontractors shall provide and maintain insurance for the duration of the warranty period against claims for injuries to persons and damage to property, which may arise from, or in connection with, performance under the Agreement by the CONTRACTOR, its agents, representatives, employees or subcontractors, if applicable.

11.1.3 Minimum Scope & Limits of Insurance

.1 Coverage at least as broad as Commercial General Liability Insurance of $4,000,000 combined single limit per occurrence. If the annual aggregate applies it must be $4,000,000 or higher. Insurance Services Office Commercial General Liability coverage (occurrence form CG 00 01) or Insurance Services Office Form (CG 00 09 11 88 County's and Contractor's Protective Liability Coverage Form - Coverage for Operations of Designated Contractor).

.2 Comprehensive Automobile Liability Insurance of $1,000,000 per occurrence for bodily injury and property damage. If the annual aggregate applies it must be no less than $2,000,000.

.3 Workers' Compensation Insurance as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than $1,000,000 per accident for bodily injury or disease.

.4 Builders' Risk:

i The County will provide Builder's Risk Insurance. Bidders are to exclude the cost of Builder's Risk Insurance from their bid.

.5 Contractor's Pollution Legal Liability.

i. The Contractor shall provide Contractor's Pollution Legal Liability and/or errors and omissions with a limit no less than $1,000,000 per claim or occurrence and $2,000,000 aggregate per policy period of one year.

11.1.4 Specific Provisions of the Certificate

.1 If any of the required insurance is written on a claims made form, the retroactive date must be before the date of the Contract or the beginning of the Contract work and must be maintained and evidence of insurance must be provided for at least five (5) years after completion of the Contract work.

.2 The General Liability and Automobile Liability policies are to be endorsed to contain the following provisions:

.3 *The COUNTY, its officers, agents, officials, employees and volunteers are to be covered as additional insureds as respects: liability arising out of work or operations performed by or on behalf of the Contractor; or automobiles owned, leased, hired or borrowed by the CONTRACTOR.*

.4 *For any claims related to this project, the CONTRACTOR 's insurance coverage shall be primary insurance as respects the COUNTY, its officers, agents, officials, employees and volunteers. Any insurance or self-insurance maintained by the COUNTY, its officers, agents, officials, employees or volunteers shall be excess of the CONTRACTOR 's insurance and shall not contribute with it.*

.5 *Each insurance policy required by this Agreement shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days prior written notice has been provided to the County.*

11.1.5 The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the County for all work performed by the CONTRACTOR, its employees, agents and subcontractors:

.1 Waiver of Subrogation. The workers' compensation policy shall be endorsed with a waiver of subrogation in favor of the COUNTY for all work performed by the CONTRACTOR, its employees, agents and subcontractors. CONTRACTOR waives all rights against the COUNTY and its officers, agents, employees and volunteers for recovery of damages to the extent these damages are covered by the workers compensation and employers liability. CONTRACTOR waives all rights against the DISTRICT and its officers, agents, employees and volunteers for recovery of damages to the extent these damages are covered by the workers compensation and employers liability.

.2 <u>Deductibles and Self-Insured Retentions</u>

i The COUNTY Risk Manager must approve any deductible or self-insured retention that exceeds $100,000.

11.1.6 <u>Acceptability of Insurance</u>

A. Insurance must be placed with insurers with a current rating given by A.M . Best and Company of no less than A:VII and a Standard & Poor's Rating (if rated) of at least BBB and from a company approved by the Department of Insurance to conduct business in California. Any waiver of these standards is subject to approval by the

County Risk Manager.

11.1.7 Verification of Coverage

.1 *Prior to approval of this Agreement by the* COUNTY, *the* CONTRACTOR *shall file with the submitting department, certificates of insurance with original endorsements effecting coverage and a copy of the declarations page from the policy in effect in a form acceptable to the* COUNTY. *Endorsements must be signed by persons authorized to bind coverage on behalf of the insurer. The* COUNTY *reserves the right to require certified copies of all required insurance policies at any time.*

11.2 **ADDITIONAL CONSTRUCTION INSURANCE REQUIREMENTS:**

11.2.1 Payment Bond: For public works projects of more than $25,000 a "payment bond" is required in the full amount of the Contract price, and shall insure to the benefit of persons performing labor or furnishing materials in connection with the work of the Contract. This bond shall be maintained in full force and effect until all work under the Contract is completed and accepted by the COUNTY, or until all claims for materials and labor have been paid, whichever is longer.

11.2.2 Performance Bond: For public works projects of more than $25,000 a "performance bond" is required in the full amount of the Contract price and shall insure the faithful performance by Contractor of all work under the Contract. It shall also insure the replacing of, or making acceptable, any defective materials or faulty workmanship.

11.2.3 Acceptability of Surety: Only California admitted sureties with current AM Best Rating of no less than VII.

ARTICLE 12
CHANGES IN THE WORK

12.1 **CHANGE ORDERS**

12.1.1 Definition: A Change Order is a written order to the Contractor signed to show the agreement of the County, the Contractor, the Engineer, and the Construction Manager issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time shall be changed only by Change Order. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including the adjustment in the Contract Sum or the Contract Time, for full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.

12.1.2 Subject to legal requirements relating to competitive bidding, the County, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletion or other revisions, the Contract Sum and Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.

PCO/Work Orders.

Changes also may be made pursuant to a PCO/Work Order, which shall direct a change in the Work and state a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. A PCO/Work Order shall be used in the absence of total agreement on the terms of a Change Order, or when time does not permit processing of a Change Order prior to implementation of the change. Work completed under a

PCO/Work Order not yet converted to a Change Order may be billed on progress billings only to an amount that does not cause the total billing to exceed 85% of Contract value as modified by approved change orders.

Upon receipt of a PCO/Work Order, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager within five (5) calendar days of the Contractor's agreement or disagreement with the method, if any, provided in the PCO/Work Order for determining the proposed adjustment in the Contract Sum or Contract Time.

Failure to respond to and return a PCO/Work Order to the County within five (5) days indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

Costs mean an itemized breakdown of all labor (by crafts), materials, sales taxes, large equipment rentals, etc., for each portion of the Work which comprises the change order including any subcontractor's itemized breakdown.

The Contractor's combined overhead and profit for work performed by its own forces shall be fifteen percent (15%) of the costs. If the changed work is performed by a Subcontractor, the Subcontractor shall also be entitled to an allowance of fifteen percent (15%) of its labor costs for overhead and profit, and fifteen (15%) of its material costs. The Contractor shall be allowed to mark-up the Subcontractor's price five (5%) for its overhead and profit. Cumulative total markup for all tiers of contractors and subcontractors shall not exceed twenty percent (20%).

The cost or credit to the County resulting from a change in the Work shall be determined in one or more of the following ways:

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

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

.3 by cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 by the method provided in Subparagraph 13.1.3.1 and 13.1.3.2.

.5 A "cost plus" adjustment subject to the following limitations:

a. Record Keeping. In the event that the pricing method selected is the "cost plus" method described above, the Contractor shall keep and present daily, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data of the labor, materials, and equipment used during that day. All labor shall be recorded on separate time sheets clearly identified with the PCO/WO number and scope of extra work involved. These time sheets shall be signed daily by the Inspector or the Construction Manager. No costs will be allowed for time not recorded and signed the same day the work takes place. The Contractor and the Construction Manager shall discuss and attempt to resolve any disputes concerning the Contractor's daily records at the time the report is submitted.

b. Reconciliation. The Contractor shall on a monthly basis accompanying the progress payment request submit a reconciliation for all work performed under a cost plus PCO during the period of the progress payment. A final reconciliation shall be submitted within 30 days after the work of the PCO is completed. The reconciliation shall recap all costs and appropriate markups for the period. No costs will be allowed for work not included in a reconciliation within the time periods specified.

12.1.3 If none of the methods set forth in Clauses 12.1.2.1, 12.1.2.2, or 12.1.2.3 is agreed upon, the Contractor, provided that a written order signed by the County is received, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Construction Manager, on the basis of reasonable expenditures or savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit as specified below. In such case, and also under Clause 12.1.2.3 above, the Contractor shall keep and present, in such form as the County or the Construction Manager may prescribe, an itemized accounting of actual cost together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor including social security, Medicare and unemployment insurance and fringe benefits required pursuant to Section 16.9; workers' or workmen's compensation insurance; rental value of equipment and machinery exclusive of small tools, whether rented from the Contractor or others; and the additional costs of supervision as follows:

12.1.3.1 Costs of first line supervision labor, including labor burden as described in 12.1.3. "First Line Supervision" shall mean a working foreman or lead craft worker other than the project superintendent;

12.1.3.2 Actual cost of the project superintendent associated with any period of compensable delay caused by issuance of the change order. In the absence of a compensable delay, all of the project superintendent's time is considered to have been paid for as part of the overhead;

Upon determination of cost by the Construction Manager, payments to the Contractor may be made based on the Construction Manager's approval of a Project Certificate for Payment. If the Contractor disputes the Construction Manager's cost determination, the Contractor may initiate a claim per the claims and disputes resolution provisions of Paragraph 7.4.

"Overhead" shall include the following: Preparation of all paperwork related to changes in the Work, including field review, estimating and cost breakdown; coordination and supervision, both office and field, including the project superintendent; vehicles including gas and maintenance; small tools, incidentals and consumables; engineering, detailing, and revisions to shop drawings and as-built drawings; general office expense; extended and unabsorbed home office overhead; warranty; costs of bonds, liability insurance, and all taxes; and all other expenses not specifically included in Section 12.1.3 above.

The amount or credit to be allowed by the Contractor or subcontractor to the County, as confirmed by the Construction Manager, for any deletion or change that results in a decrease in the Contract Sum will be the amount of the actual net cost plus five percent (5%) for overhead and profit. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall

be figured on the basis of the net increase or decrease, if any, with respect to that change.

12.1.4 Variation in Estimated Quantities: If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated as so changed in a proposed Change Order, that application or the agreed unit prices to the quantities of Work proposed will cause substantial inequity to the County or the Contractor, the applicable unit prices shall be equitably adjusted.

Effect on Sureties.
All changes authorized by the Contract Documents may be made without notice to or consent of the sureties on the Contract bonds, and shall not reduce the sureties' liability on the bonds.

The County reserves the right to require additional payment or performance bonds to secure a change order.

12.2 CONCEALED CONDITIONS

12.2.1 If this Contract requires the digging of trenches or other excavations that extend deeper than four feet below the existing surface, the following provision shall apply to those trenches or excavations:

12.2.1.1 In the event that any of the following described conditions is suspected to exist in the trench or excavation, the Contractor shall promptly, and before the condition is disturbed, notify the Construction Manager, in writing, of any:

a. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

b. Subsurface or latent physical conditions at the site differing materially from those indicated.

c. Unknown physical conditions at the site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

12.2.1.2 Upon receipt of notice from the Contractor, the Construction Manager, the County and the Engineer shall promptly investigate the conditions, and if it is determined that the conditions do materially so differ or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a Change Order or PCO/Work Order under the procedures described in 12.3.

12.2.1.3 In the event that a dispute arises between the County and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's

cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract Documents, but shall proceed with all work to be performed under the Contract Documents. The Contractor shall retain any and all rights provided either by the Contract Documents or by law which pertain to the resolution of disputes and protests between the contracting parties.

12.3 **REQUEST FOR EQUITABLE ADJUSTMENT**

12.3.1 If the Contractor considers a Request for Equitable Adjustment is justified for an increase in the Contract Sum or Time, the Contractor shall promptly, upon first observance of the condition giving rise to the request, provide the Construction Manager and County written notice of such condition and circumstance. This notice shall be given by the Contractor before proceeding to execute the Work, except in emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 11.3. No such request shall be valid unless so made. Any change in the Contract Sum or Time resulting from such request for equitable adjustment shall be authorized by Change Order.

12.3.2 If the Contractor requests that additional cost or time is involved because of, but not limited to, (1) any written interpretation pursuant to Subparagraph 2.2.8, (2) any order by the County to stop the Work pursuant to Paragraph 3.3 where the Contractor was not at fault, or any such order by the Construction Manager as the County's agent, (3) any written order for a minor change in the Work issued pursuant to Paragraph 13.4, the Contractor shall make such request for equitable adjustment as provided in Subparagraph 13.3.1.

12.4 **MINOR CHANGES IN THE WORK**

12.4.1 The Construction Manager will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be enacted by written order issued through the Construction Manager, and shall be binding on the County and the Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 13
UNCOVERING AND CORRECTION OF WORK

13.1. **UNCOVERING OF WORK**

13.1.1. If any portion of the Work should be covered contrary to the request of the Construction Manager or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Construction Manager, be uncovered for their observation and shall be replaced at the Contractor's expense.

13.1.2. If any other portion of the Work has been covered which the Construction Manager has not specifically requested to observe prior to it's being covered, the Construction Manager may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and

replacement shall, by appropriate Change Order, be charged to the County. If such Work is found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the County or a separate Contractor as provided in Article 5 in which event the County shall be responsible for the payment of such costs.

13.2. CORRECTION OF WORK

13.2.1. The County shall have the right to reject materials and workmanship which are determined by the Construction Manager, the Engineer, or the Inspector to be defective or fail to comply with the Contract Documents. Rejected workmanship shall be corrected satisfactorily, and rejected materials shall be removed from the premises and replaced, all without cost to the County.

13.2.2. The Contractor shall correct, within seven (7) days, all Work rejected by the Construction Manager as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion of the Work and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Construction Manager's additional services made necessary thereby.

13.2.3. If, within 3 years after the recordation of the Notice of Completion of the Work or designated portion thereof, or within 3 years after acceptance by the County of designated equipment, or within such longer period of time as may be prescribed by the terms of any applicable special warranty required by the Contract Documents, any of the Work to be found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the County to do so unless the County has previously given the Contractor a written acceptance of such condition, This obligation shall survive both final payment for the Work or designated portion thereof and termination of the Contract. The County shall give such notice promptly after discovery of the condition.

13.2.4. The Contractor shall, at its sole expense, remove from the site all portions of the Work, which are defective or nonconforming and which have not been corrected under Subparagraphs 4.5.1, 13.2.1 and 13.2.3,unless removal is waived by the County.

13.2.5. If the Contractor fails to correct defective or nonconforming Work as provided in Subparagraphs 4.5.1, 13.2.1 and 13.2.2, the County may correct it in accordance with Paragraph 3.4.

13.2.6. If the Contractor does not proceed with the correction of such defective or nonconforming Work within a reasonable time fixed by written notice from the Construction Manager, the County may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the County may, upon ten additional days' written notice, sell such Work at auction or at private sale and shall account for the proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Construction Manager, Engineer or other Professional's additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the County.

13.2.7. 14.2.6 The Contractor shall bear the cost of making good all work of the County or separate contractors destroyed or damaged by such correction or removal.

13.2.8. 14.2.7 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to any other obligation, which the Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time periods noted in Subparagraph 12.2.2, or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents, relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the Contractor's obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

13.3. ACCEPTANCE OF DEFECTIVE OR NONCONFORMING WORK

13.3.1. If the County prefers to accept defective or nonconforming Work, the County may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 14
TERMINATION OF THE CONTRACT

14.1. TERMINATION BY THE CONTRACTOR

14.1.1. If the Work is stopped for a period of sixty days under an order of any court or other public authority having jurisdiction, or as a result of an act of government such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or a Subcontractor or any agents or employees or any other persons performing any of the Work under a Contract with the Contractor, then the Contractor may, upon thirty additional days' written notice to the County and the Engineer, terminate the Contract and recover from the County payment for all work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery.

14.2. TERMINATION BY THE COUNTY

14.2.1. Termination by the County for Cause

If the Contractor is adjudged bankrupt, or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of the Contractor's insolvency, or stop notices are served upon the County, or if the Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or fails to make prompt payment to Subcontractors for materials or labor, or the Contractor or a subcontractor persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or persistently disregards instructions of the Construction Manager, Engineer or County, or otherwise is guilty or a subcontractor is guilty of a substantial violation of a provision of the Contract Documents, or the Contractor fails to provide and keep in full force and effect all insurance required by Article 11, or fails to cause all subcontractors to so comply, and fails after written notice to commence and continue correction of such default, neglect or violation with diligence and promptness, the County upon

certification by the Construction Manager that sufficient cause exists to justify such action, may, after an additional written notice and without prejudice to any other remedy the County may have, terminate the Contract.

Procedure for Termination for Cause.
Unless within seven (7) days of the delivery of such notice, the Contractor shall cease such violation and make satisfactory arrangements for a correction thereof, which arrangements are set forth in a written agreement signed by the Contractor and the Construction Manager, the Contractor's right to complete the Work shall cease and terminate.

In the event of any such termination, the County shall, immediately give written notice thereof to the surety and to the Contractor and the surety shall have the rights and obligations set forth in the performance bond. If the County is forced to take over the Work, it may prosecute the same to completion by Contract or by any other method it may deem advisable, for the account and at the expense of the Contractor, and the Contractor and its sureties shall be liable to the County for any excess costs, including management, supervision, and design support, occasioned thereby. In such event, the County may, without liability take possession of and utilize in completing the Work, the Contractor's materials, equipment, tools, construction equipment and machinery whether stored at the Site or elsewhere, thereon owned by the Contractor and may finish the Work by whatever methods the County may deem expedient. Whenever the Contractor's right to proceed is terminated, the Contractor shall not be entitled to receive any further payment until the Work is finished.

14.2.2. If the unpaid balance of the Contract Sum exceeds all direct and indirect costs of finishing the Work, including compensation for the Construction Manager's additional services made necessary thereby, Contractor will only be paid for its actual unpaid costs from such excess. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the County. The amount to be paid to the Contractor or to the County, as the case may be, shall be certified by the Construction Manager, upon application, in the manner provided in Paragraph 10.4 and this obligation for payment shall survive the termination of the Contract.

14.2.3. Suspension of Performance: Independent of any right to terminate this Agreement, the authorized representative of County for which CONTRACTOR'S services are to be performed, may immediately suspend performance by CONTRACTOR, in whole or in part, in response to health, safety or financial emergency, or a failure or refusal by CONTRACTOR to comply with the provisions of this Agreement, until such time as the cause for suspension is resolved, or a notice of termination becomes effective.

County will have the right to terminate this Agreement without cause by giving thirty (30) days prior written notice of intention to terminate pursuant to this provision, specifying the date of termination. County will pay to the CONTRACTOR the compensation earned for conforming, non-defective, work performed and not previously paid for to the date of termination. County will not pay CONTRACTOR for lost anticipated profits or other economic loss. The payment of such compensation is subject to the restrictions on payment of compensation otherwise provided in this Agreement, and is conditioned upon receipt from CONTRACTOR of any and all plans, specifications, records, photographs, logs, and estimates, and other documents pertaining to the Project.
No sanctions will be imposed.

In connection with any termination for convenience, Contractor shall allow County,

Construction Manager or any authorized representative(s) to inspect, audit, or reproduce any records to the extent necessary for County or Construction Manager to evaluate and verify the costs incurred by Contractor in performing the Work, including direct and indirect costs such as overhead allocations. Contractor will make this material available upon 48-hours' written notice from County or Construction Manager. County and Construction Manager may inspect and copy, from time to time and at reasonable times and places, any and all information, materials and data of every kind and character (hard copy, as well as computer readable data if it exists), including without limitation, books, papers, documents, subscriptions, recordings, estimates, price quotations, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers, monthly, quarterly, yearly or other financial statements, and any and all other information or documentation that may, in the judgment of County or Construction Manager, have any bearing on or pertain to any matters, rights, duties, or obligations under or covered by the Contract Documents. Such records shall include but not be limited to, the following: accounting records, payroll records, job cost reports, job cost history, margin analysis, written policies and procedures, subcontract files (contracts, correspondence, change order files, including documentation covering negotiated settlements), backcharge logs and supporting documentation, general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends, and any other documents customarily maintained by contractors performing work on public works projects or that County or Construction Manager otherwise deem necessary to substantiate charges related to a Termination.

If this Contract is terminated for default under Article 15 and if it is later determined that the default was wrongful, such default termination automatically shall be converted to and treated as a termination for convenience under this Section. In such event, Contractor shall be entitled to receive only the amounts payable under this Section, and Contractor specifically waives any claim for any other amounts or damages, including any claim for consequential damages or lost profits.

ARTICLE 15
ADDITIONAL INSTRUCTIONS

15.1 SUBSTITUTION OF MATERIALS

When a specific manufacturer, trade name or material is specified or indicated, it is to establish a standard of quality and shall not be constructed as limiting competition. Materials, products, processes, or articles indicated are specified by the name brand of the manufacturer or by patent or proprietary names, shall be deemed to be followed by the words "or equal". If the Contractor desires to use material other than that specified he or she shall request approval of such substitution, in writing to the County's Representative. Requests for substitutions shall be in the hands of the County's Representative no later than (14) calendar days prior to the date in which addenda will be issued for pre-bid requests per section 00100 Instructions to bidders. Materials found acceptable will be approved by a duly authorized Addendum. Also per section 00100, if a bidder submits non-approved material substitutions, Itemized Breakdown: The Contractor shall submit a financial breakdown of the work, itemized by crafts or sections as designated by the Construction Manager. The Contractor's payment shall be based upon the monthly percentage of completion of these items.

Lien Waivers: The County or Construction Manager may require the Contractor to submit, along with the progress payment request, notarized lien waivers from each subcontractor, materials or equipment supplier. Lien waivers shall comply with Civil Code § 3262. The aggregate sum of which shall reflect previous progress payments.

15.1.1 it assumes the risk that said substitution may not be approved. Approval of non-approved material substitutions will be made post-bid through the due diligence process. For post-bid substitutions requests, data substantiating the request may be submitted up to 35 days following the Notice of Award. Materials found acceptable will be approved by duly authorized Change Order. It is the intent of this article to comply with Public Contracts Code Section 3400.

If the Contractor desires to use material other than that specified, he or she shall request approval of such substitution, in writing, to the Construction Manager. Such application constitutes a certification that the Contractor:

A. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.

B. Will provide the same warranty for equal as for specified product.

C. Will coordinate installation and make other changes which may be required for work to be complete in all respects.

D. Waives claims for additional costs which may subsequently become apparent.

The Engineer then will determine whether or not the proposed material is equal in quality and utility to the material specified, and its decision shall be final.

Requests for equal materials will only be considered when offered by the Contractor as required by this article.

Requests for substitutions shall be in the hands of the Construction Manager no later than seven (7) calendar days prior to the date on which a decision is needed. Data substantiating the request may be submitted up to 15 days following the Notice of Award. Materials found acceptable will be approved by a duly authorized Addendum or Change Order.

15.1.2 Submittals for approval of substitute materials shall contain sufficient information, descriptive brochures, drawings, samples or other data as is necessary to provide direct comparison to the specified materials. Each submittal shall be well marked and identified as to types and kind of the items being submitted for approval. It is the sole responsibility of the Contractor to submit complete descriptive and technical information so the Engineer can make proper appraisal. Lack of proper information will be sufficient cause for rejection. Reference to catalogs that the Engineer may or may not have will not be acceptable.

15.1.3 The Engineer's review for approval is for quality of visual appearance. It is the Contractor's responsibility to confirm and correlate all quantities and dimensions and coordinate with all trades whose work may be affected by the requested substitution.

15.1.4 Substitutions.
Unless otherwise provided in the technical specifications, the Contractor may make proposals for substitutions to materials and/or processes shown or specified only under one or more of the following conditions:

.1 Unavailability: If the specified product or an equal is no longer available in the marketplace.

.2 Delay: If obtaining the specified product or an equal will delay completion of the Work through no fault of the Contractor.

.3 Better material system or process: If a better material system or process is available at no additional cost.

.4 Savings: If a material which meets all of the performance requirements of the specified material is available at a savings to the County.

A proposal for substitution shall include all information required by the Engineer to evaluate the substitute material or process. All substitutions shall be submitted for approval. Such proposal constitutes a certification that the Contractor:

.5 Has investigated the proposed product and determined that it meets or exceeds the performance requirements of the specified product.

.6 Will provide the same or better warranty for substitution as for specified product.

.7 Will coordinate installation and make other changes, including work of other Contractors, which may be required for the work to be complete in all respects at no additional cost to the County.

Effect of Approval of Substitution.
If the substitution is approved, the Contractor shall be solely and directly responsible for setting approved substituted materials and/or equipment into the available space, and for the proper operation of the substituted equipment with all other equipment with which it may be associated, all in a manner acceptable to the County.

No time extensions shall be granted on account of a substitution. The Contract Sum shall be adjusted by the price difference between the approved substitution and the originally specified item.

Time for Proposing Substitution; Decision.
Substitution proposals will not be considered prior to bidding. All requests for substitutions shall be made within the same time requirement for initial submittals. Failure to timely submit a substitution request shall constitute a waiver by the Contractor and an acceptance of the specified materials. Late submittals may be considered only when the Construction Manager consents in writing, and the County's best interests so require.

The Construction Manager and the Engineer shall evaluate a timely substitution request, and shall approve, deny, approve with conditions, or initiate the procedure for a change order in response to the Contractor's request. This decision shall be final. If the proposed substitution is rejected, the Contractor shall provide the material originally specified. No time extensions will be granted in connection with substitution requests.

Failure by the Contractor to identify all deviations from the Contract Documents in its request for substitution shall render any County action taken thereon null and void. The Contractor shall bear all costs resulting from any error in the request for substitution. Only one request for substitution will be considered for each product. When substitution

is not accepted, specified product shall be provided.

Samples and Testing of Proposed Substitutions; Costs of Adapting to Work.
When the Construction Manager or Engineer determines that samples and testing are required to evaluate a request for a substitution, the Construction Manager shall so advise the Contractor, and specify the materials or work to be sampled. The Contractor shall, at no cost to the County, provide samples as required by Article 7 dealing with samples and testing, or the Technical Specifications.

The Contractor shall bear all costs of sampling and testing required to decide a request for substitution, and if a substitution is accepted, the Contractor shall bear all costs associated therewith, including the cost of the Construction Manager's, Engineer's and/or Engineer's services required to adapt the substitution to the design to the complete satisfaction of the County, and all costs of mechanical, electrical, structural, or other changes needed to adapt the substitution to the Work.

15.2 REFERENCE TO STANDARDS

15.2.1 Reference to known standards shall mean and intend the latest edition or amendment, in effect on the date of the Bid, unless specifically indicated otherwise, and to such portions of it that relate and apply directly to the material or installation called for on the project.

15.2.2 Where material is specified solely by reference to standard specifications, the Contractor shall, if requested by the Construction Manager, submit to the Construction Manager for his or her approval, data on all such material proposed to be incorporated into the Work of the Contractor listing the name and address of the vendor, the manufacturer or producer, and the trade or brand names of such materials.

The standard referred to, except as modified in the specifications, shall have full force and effect as though printed in these specifications. These standards are not furnished to the bidder for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements.

.1 Where Federal Specifications are referred to as a measure of quality and standard, they refer to Federal Specifications established by the Procurement Division of the United States Government and are available from the Superintendent of Documents, U.S. Government Printing Office.

.2 Where Federal Specification numbers are used, they refer to the latest edition including amendments thereto.

.3 Where Commercial Standards (CS) or Product Standards (PS) are referred to as a measure of quality, standard, and method of fabrication, they refer to Commercial Standards and Product Standards issued by the U.S. Department of Commerce.

.4 Where ASTM serial numbers are used, they refer to the latest tentative specifications, standard specifications, standard method or standard methods of testing, issued by the American Society for Testing Materials, unless specifically noted.

15.3 **SPECIFICATIONS**

15.3.1 The Specifications are organized into Divisions, Sections, and Trade headings based on the Construction Specifications Institute's 48-Division format and the Master format numbering system. This organization shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of the Work to be performed by any trade. The Contractor shall be responsible for examining all sections of the Specifications for inter-related items of the Work, and for furnishing each item identified or specified.

15.3.2 No responsibility will be assumed by the County or the Construction Manager for omissions or duplications by the Contractor in the completion of the Contract due to any alleged error in the arrangement of the material in these Specifications nor shall any such segregation of work and materials operate to make the Construction Manager an arbiter in defining the limits to the agreements between the Contractor and its subcontractors or suppliers.

15.3.3 The misplacement, addition or omission of any letter, word or punctuation mark shall in no way damage the true spirit, intent or meaning of these Specifications.

15.3.4 The words "shown", "indicated", "noted", "scheduled" or words of that effect shall be understood to mean that reference is made to the Drawings accompanying these Specifications.

15.3.5 Where reference herein is made to colors or finishes "as selected", the reference is to the Construction Manager with concurrence by the County.

15.4 **APPROVED APPLICATORS**

15.4.1 Where specific instruction in these Specifications require that a particular product and/or materials be installed and/or applied by an "approved applicator" of the manufacturer, it shall be the Contractor's responsibility to insure that any subcontractors used for such work be approved applicators.

15.5 **DELIVERY AND STORAGE OF MATERIALS**

15.5.1 Deliver all manufactured materials in the original packages, containers or bundles (with the seals intact) bearing the name or identification mark of all manufacturers.

15.5.2 Deliver fabrications in as large assemblies as practicable and where specified to be shop-primed or shop-finished; they shall be packaged or crated as require to preserve such priming or finish intact and free from abrasion.

15.5.3 Store all materials in such manner as necessary to properly protect same from damage, as materials or equipment damage by handling, weather, dirt or from any other cause will not be acceptable.

15.5.4 Store materials off sidewalks, roadways, and underground services to cause no obstructions. The Contractor shall be responsible for protecting all material and equipment furnished under the Contract.

15.6 **WORKMANSHIP**

15.6.1 Where not more specifically described in any of the various Sections of these

Specifications, workmanship shall conform to all of the methods and operations of best standards and accepted practices of the trade or trades involved, and shall include all items of fabrication, construction, or installation regularly furnished or required for completion (including any finish), and for successful operation as intended.

15.6.2 All work shall be executed by mechanics skilled in their respective lines of work.

15.6.3 When completed, all parts shall have been durably and substantially built and shall present a neat, workmanlike appearance.

15.7 FINAL GUARANTEE

15.7.1 The Contractor shall be held responsible for, and must make good any defects through faulty, improper, or inferior workmanship or materials, arising or discovered in any part of its work or structure, piping and appurtenances, within three (3) years after the filing of the Notice of Completion. The Performance Bond, furnished by the Contractor, shall cover such defects and protect the County against them.

15.8 HOURS OF WORK

15.8.1 Eight (8) hours of labor shall constitute a legal day's work upon all work done hereunder, and it is expressly stipulated that no worker employed at any time by the Contractor, or by a subcontractor under this Contract, upon the work, shall be required or permitted to work thereon more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week, except as provided in Section 1810-1815 inclusive, of the Labor Code of the State of California, all the provisions whereof are deemed to be incorporated herein as if fully set out; and it is further expressly stipulated that for each and every violation of said last named stipulation, said Contractor shall forfeit, as a penalty to the County, twenty-five dollars ($25.00) for each worker employed by the Contractor in the execution of this Contract, for each calendar day during which said worker is required or permitted to labor more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week in violation of the provisions of said section of the Labor Code.

15.8.2 The Contractor and each subcontractor shall also keep or cause to be kept, an accurate record showing the names and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the work contemplated by this Agreement, which record shall be open at all reasonable hours to the inspection of the County or its officer or agents, and to the Division of Labor Law Enforcement of the Department of Industrial Relations, its deputies and agents.

15.8.3 Notwithstanding the above stipulations, pursuant to Section 1815 of the Labor Code, work performed by employees of contractors in excess of eight (8) hours per day and forty (40) hours during any one week shall be permitted upon the project upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1 1/2) times the basic rate of pay.

15.8.4 Whenever the Contractor arranges to work at night or any time when work is conducted other than the normal 40-hour week, or to vary the period during which work is carried on each day, it shall give the Construction Manager a minimum of 48-hours notice so that inspection may be provided. Additional inspection costs incurred because of overtime or shift work shall be paid by the County. If this overtime work is necessitated by the Contractor's error or failure to perform, the cost of inspection will be borne by the Contractor.

15.9 WAGE RATES

15.9.1 Pursuant to Section 1770-1780 of the Labor Code of the State of California, the Department of Industrial Relations has determined the general prevailing rate of per diem wages and rates for legal holidays and overtime in the locality in which this work is to be performed, for each craft or type of worker or mechanic needed to execute this Contract. Said wage rates pursuant to Section 1773.2 of the Labor Code are on file with the Clerk of the Board of Supervisors, Administration Building, County Civic Center, 2800 W. Burrel Avenue, Visalia, CA and will be made available to any interested person upon request. They may also be obtained on the internet at www.dir.ca.gov/DLSR/pwd.html. Those prevailing wage rates hereby are incorporated in this Agreement and made a part hereof.

15.9.2 It shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractor under him to pay not less than the said specified rates to all laborers, worker, and mechanics employed by them in the execution of the Contract, and to pay all laborers, workers and mechanics not less often than once weekly. The Contractor to whom the Contract is awarded shall post a copy of the determination of prevailing wages at the job site. The Contractor shall require all subcontractors to comply with Sections 1770-1780 of the Labor Code of the State of California and shall insert into every subcontract the requirements contained therein. The Contractor shall be responsible for compliance by each subcontractor with Labor Code Section 1776.

15.9.3 It is hereby further agreed that the Contractor shall forfeit to the County, as a penalty, fifty dollars ($50.00) for each laborer, worker, or mechanic employed for each calendar day or portion thereof, who is paid less than the said stipulated rates for any work done under the Contract, by him or by any subcontractor under him. The difference between said stipulated rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than said stipulated rate shall be paid to each worker by the Contractor. The Contractor, and each subcontractor, shall keep or cause to be kept an accurate record showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection with the public work. The records shall be open at all reasonable hours to the inspection of the County, to its officers and agents, and to the Division of Labor Law Enforcement of the State Department of Industrial Relations, its deputies and agents. In addition, the Contractor shall submit a certified copy of the payroll records of the Contractor and each subcontractor to the awarding body within seven (7) days after the payroll week ending date.

15.9.4 In case it becomes necessary for the Contractor or any subcontractor to employ on the work under this Contract any person in a trade or occupation (except executive, supervisory, administrative, clerical or other non-manual workers as such) for which no minimum wage rate is specified, the Contractor shall immediately notify the County who will promptly ,after consultation with the DIR, determine the prevailing rate for such additional trade or occupation from the time of the initial employment of the person affected and during the continuance of such employment. The Contractor and all subcontractors shall pay each worker engaged in the specified work not less than those rates. Pending such determination, the wages may be assumed to be those in the applicable collective bargaining agreement, but no adjustment in the Contract Price shall be made if such assumption is incorrect.

15.9.5 No contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code § 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code § 1771.1(a)]. No contractor or subcontractor may be awarded a Contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code § 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

According to sections 1770-1780 of the Labor Code of the State of California, the Director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages in the locality for each craft or type of worker needed to execute the Contract.

The Contractor to whom the Contract is awarded and any subcontractor under it will pay all workers employed on the work at least the rates determined by the Director of the Department of Industrial Relations. Copies of the prevailing rate of per diem wages are on file with the Department of Industrial Relations, Division of Apprenticeship Standards, 455 Golden Gate Avenue 10th Floor, San Francisco, California 94102, and at the principal office of the Owner, and are available to any interested party on request.

According to Labor Code § 1775, the Contractor will, as a penalty to the Owner, forfeit not more than $200.00 for each calendar day or portion of a day, for each worker paid less than the prevailing rates as determined by the director for the work or craft in which the worker is employed. The amount of this penalty will be determined by the California State Labor Commissioner and will be based on the consideration of the Contractor's failure to pay the correct rate as a good faith mistake, penalties assessed against the Contractor within the previous three years for failing to meet its prevailing wage obligations, or the Contractor's willful failure to pay the correct rates of prevailing wages.

According to Public Contract Code § 6109, with respect to subcontractors which are ineligible to perform work on public works projects according to Labor Code § 1777.1 or 1777.7:

1. The Contractor must not allow any such subcontractor to work on this project.
2. The Contractor must repay to the Owner any money paid to any such subcontractor allowed to work on this project.
3. The Contractor will pay the wages of the workers of any such subcontractor allowed to work on this project.

According to Labor Code § 1776, the Contractor and each subcontractor are required to keep or cause to be kept an accurate record showing the names and occupations of all laborers, workers and mechanics employed by it in connection with the execution of this Contract or any subcontracts, and showing also the actual per diem wage paid to each of such workers, which records will be open at all reasonable hours to inspection by the Owner, its officers and agents and to representatives of the Division of Labor Standards Enforcement of the State Department of Industrial Relations. The certified payroll records are required to be on forms provided by the Division of Labor Standards Enforcement or will contain the same information as the forms provided by the division.

15.10 **APPLICATION OF HIGHEST STANDARDS AND REQUIREMENTS**

15.10.1 Whenever two or more standards or requirements appear in these General Conditions or in any other part of the Contract Documents that form the Contract, the highest standard or requirement shall be applied and followed in the performance under this Contract.

15.11 NONDISCRIMINATION IN EMPLOYMENT

15.11.1 Federal and State Laws prohibit discrimination in employment. The California Fair Employment Practices Act (Labor Code § 1410 to 1433) prohibits discrimination in employment on the basis of race, religion, color, sex, physical handicap, medical condition, marital status, age, national origin or ancestry, and applies to all employers, employment agencies and labor organizations.

15.11.2 Title VII of the Federal 1964 Civil Rights Act (42 U.S.C. § 2000e - 2000e - 17) prohibits employment discrimination on the basis of race, color, sex, religion, or national origin, and applies to all employers that employ at least 15 workers during each working day in each of 20 or more calendars weeks in the current or preceding year.

15.11.3 In addition to these two laws of general application, there are other Federal and State laws that prohibit employment discrimination in particular cases.

15.11.4 The County of Tulare is an Affirmative Action Employer and expects all of its contractors and suppliers to familiarize themselves with, and comply with, all applicable laws relating to employment discrimination.

15.11.5 To the extent required by law, the Contractor shall meet all requirements of law relating to the participation of minority, women, and disabled veteran business enterprise contracting goals, and shall comply with Public Contract Code § 10115 et seq. and all applicable regulations. Contractor further agrees that, when required, Contractor will ensure compliance by all subcontractors and will complete all forms required by all agencies exercising jurisdiction over the project.

15.12 APPRENTICES

15.12.1 Pursuant to Sections 1770-1780 of the Labor Code of the State of California, the Department of Industrial Relations has determined the general prevailing rate of per diem wages in the locality for each craft or type of worker needed to execute the Work. Said wage rates pursuant to § 1773.2 of the Labor Code are on file with the Clerk of the Board of Supervisors, Administration Building, County Civic Center, Visalia, California, and will be made available to any interested person on request.

15.12.2 Pursuant to Section 1775 of the Labor Code of the State of California, nothing in this chapter shall prevent the employment of properly registered apprentices upon public works.

15.12.3 Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed only at the work of the craft or trade to which he or she is registered.

15.12.4 Only apprentices, as defined in § 3077, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4 (commencing at Section 3070), Division 3, of the Labor Code, are eligible to be employed on public works. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he or she is training.

15.13 **PROVISIONS REQUIRED BY LAW DEEMED INSERTED**

15.13.1 Every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted, and this Contract shall be read and enforced as though it were included, and if through mistake or otherwise any provision is not inserted or is not correctly inserted, upon application of either party the Contract shall be amended to make the insertion or correction.

15.13.2 Conflict of Interest.

No official of the County who is authorized on behalf of the County to negotiate, make, accept, or approve, any consulting, inspection, construction, or materials supply Contract, or any subcontract in connection with the construction of the Project, or any land acquisition in connection with the Project, shall become directly or indirectly interested personally in this Contract or in any part thereof.

No officer, employee, attorney, Engineer, or inspector of or for the County who is authorized on behalf of the County to exercise any executive, supervisory, or other similar function in connection with the construction of the Project shall become directly or indirectly interested personally in this Contract or any part thereof.

15.13.3 No Verbal Agreements.

No verbal agreement or conversation with any officer, agent, or employee of the County, either before, during, or after the execution of the Contract Documents shall affect or modify any term or condition contained in the Contract Documents, nor shall such verbal agreement or conversation entitle the Contractor to any additional payment or time to perform whatsoever under the terms of this Agreement.

15.13.4 Anti-Trust Assignment.

By execution of the Contract Documents, or any subcontract awarded by the Contractor, the Contractor or any subcontractor offers and agrees to assign and hereby does assign to the County all rights, title, and interest in and to all causes of action the Contractor or subcontractor may have under Section 4 of the Clayton Act (15 USC § 15) or under the Cartwright Act (Chapter 2 of Part 2 of Division 7 of the Business and Professions Code, commencing with § 16700), arising from purchases of goods, services, or materials pursuant to this public works Contract or subcontract. This assignment shall be made and shall become effective upon execution of the Contract.

15.14 Contractor Not Agent, Nor Employee.

Neither the Contractor nor any subcontractor, or any officer, agent, or employee of either, is, nor shall they represent themselves to be, an officer, agent, or employee of the County for any purpose whatsoever.

No person employed by the Contractor, or by any subcontractors, are, nor shall they be construed to be in any manner or for any purpose whatsoever, employees of the County

ARTICLE 16
GUARANTEE

16.1 Contractor guarantees that all materials and workmanship shall conform to the Contract Documents and agrees to replace, at its sole cost and expense, and in conformity with the Contract Documents, any defective material and any and all work defectively or improperly performed or installed within a period of **one (1) year** after final acceptance in accordance with paragraph 9.8 of the General Conditions. The Contractor shall, in no

case longer than fifteen (15) days after receipt of written notice thereof, commence to repair and/or replace any defect in materials or workmanship which may develop during said **1-year** period, and any damage to adjacent materials resulting from the repairing or replacing of such defects, at its own expense and without cost to County. In the event Contractor fails to remedy any such defect within 15 days after receipt of such written notice (unless Contractor has commenced the repair and is diligently pursuing the repair to completion), County may proceed to have such defects remedied at Contractor's expense and Contractor shall pay the costs and charges incurred thereby. Emergency repairs, including but not limited to power, water, sewer, fire and life safety, shall have a 48-hour response time. The cost and repair of any supplementary damage caused by construction defects will be the sole responsibility of the Contractor. Neither acceptance nor payment nor any provision in these documents shall be deemed to be a waiver by County to relieve Contractor of any responsibility under this Contract. The Contractor shall submit a written guarantee on the form that follows.

ARTICLE 17
TITLE VI ASSURANCES

17.1 During the performance of this Agreement, the contractor, for itself, its assignees and successors in interest (hereinafter collectively referred to as CONTRACTOR) agrees as follows:

17.1.1 Compliance with Regulations: CONTRACTOR shall comply with the regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the REGULATIONS), which are herein incorporated by reference and made a part of this agreement.

17.1.2 Nondiscrimination: CONTRACTOR, with regard to the work performed by it during the AGREEMENT, shall not discriminate on the grounds of race, color, sex, national origin, religion, age, or disability in the selection and retention of sub-applicants, including procurements of materials and leases of equipment. CONTRACTOR shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the agreement covers a program set forth in Appendix B of the Regulations.

17.1.3 Solicitations for Sub-agreements, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by CONTRACTOR for work to be performed under a Sub-agreement, including procurements of materials or leases of equipment, each potential sub-applicant or supplier shall be notified by CONTRACTOR of the CONTRACTOR'S obligations under this Agreement and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

17.1.4 Information and Reports: CONTRACTOR shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the California Department of Transportation or FHWA to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of CONTRACTOR is in the exclusive possession of another who fails or refuses to furnish this information, CONTRACTOR shall so certify to the California Department of Transportation or the FHWA as appropriate, and shall set forth what efforts CONTRACTOR has made to obtain the information.

17.1.5 Sanctions for Noncompliance: In the event of CONTRACTOR's noncompliance with the nondiscrimination provisions of this agreement, the California Department of Transportation

shall impose such agreement sanctions as it or the FHWA may determine to be appropriate, including, but not limited to:

(a) withholding of payments to CONTRACTOR under the Agreement within a reasonable period of time, not to exceed 90 days; and/or

(b) cancellation, termination or suspension of the Agreement, in whole or in part.

17.1.6 Incorporation of Provisions: CONTRACTOR shall include the provisions of paragraphs 17.1 through 17.1.6 in every sub-agreement, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. CONTRACTOR shall take such action with respect to any sub-agreement or procurement as the California Department of Transportation or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance, provided, however, that, in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a sub-applicant or supplier as a result of such direction, CONTRACTOR may request the California Department of Transportation enter into such litigation to protect the interests of the State, and, in addition, CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

GUARANTEE

Guarantee for _____County of Tulare_____. We hereby guarantee that the **CNG Fueling System at the Tulare County – Transit Operations and Maintenance Facility Project**, which has been constructed in **Visalia, California**, has been constructed in accordance with the drawings and specifications, and that the work as installed will fulfill the requirements included in the specifications. The undersigned agrees to repair or replace any or all so such work, together with any other adjacent work which may be damaged in connection with such construction, that may prove to be defective in workmanship or material within a period of _____**one calendar year**___ by the _____County of Tulare_____ , ordinary wear and tear and unusual abuse or neglect expected.

In the event of the undersigned's failure to comply with the above-mentioned conditions within a reasonable period of time, as determined by the County, but not later than ten (10) days after being notified in writing by the County, the undersigned authorizes the County to to have said defects repaired and made good at the expense of the undersigned, which will pay the costs and charges therefore upon demand.

	Countersigned
_____	_____
(Proper name)	(Proper name)
Date of signature: _____	Date of signature: _____
_____	_____
(Printed name)	(Printed name)
By: _____	By: _____
_____	_____
(Signature of Subcontractor or General Contractor)	(Signature of General Contractor if for Subcontractor)

Representatives to be contacted for services;

Name: _____

Address: _____

_____

Telephone Number: _____

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END OF SECTION 000700

SECTION 003146 - PERMITS

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

Contractor must procure all permits, licenses, contracts and other services needed to prosecute the work. You must pay for all permits, licenses, contracts and other services. Payment is included in the contract price and no additional compensation will be allowed.

Submit a traffic control plan for acceptance by the Engineer. The traffic control plan shall depict the traffic control devices to be used and their location and shall be prepared by a licensed Traffic Engineer or Civil Engineer. Payment for the traffic control plan is included in the traffic control system.

You are required to pay for the cost of furnishing all flaggers, including transporting flaggers and furnishing stands and towers for flaggers to provide for the passage of traffic through the work as specified in sections 7-1.03 and 7-1.04.

You must comply with all applicable requirements and provisions of the environmental document(s) and the permits obtained for this project.

A delay to the controlling operation due to environmental requirements will be considered a temporary suspension of work under Section 8-1.06. No contract adjustment or additional compensation will be made for delays caused by environmental requirements. The days on which the suspension is in effect shall not be considered working days as defined in Section 8-1.06B.

You must comply with Article 10 of the Tulare County Ordinance Code Chapter 3, Part IV, "Recycling and Diversion of Construction and Demolition Debris," which requires you to recycle 100% of inert solids (asphalt, concrete, rock, stone, brick, sand, soil and fines) and 50% by weight of the remaining construction and demolition material generated by the work. Submit the required Pre-Plan portion of the Construction and Demolition Waste Recycling and Reuse Plan after the award of the contract to the Engineer with the contract documents identifying the material type, hauler, disposal location and the percentage of material to be reused or recycled. There is no filing fees required for this submission of this plan. A copy of the Ordinance, the form for the Construction and Demolition Waste Recycling and Reuse Plan and other information may be found at:

http://www.co.tulare.ca.us/government/solid_waste/construction_n_demolition/default.asp

Submit to the Engineer the required Final Report of the Construction and Demolition Waste Recycling and Reuse Plan prior to the Engineer's acceptance of the work.

Full compensation for all labor, tools, equipment and reporting requirements required for compliance with the Recycling and Diversion of Construction and Demolition Debris Ordinance shall be considered as included in the items of work generating this debris and no additional compensation will be allowed therefor.

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and you encounter materials you reasonably believe to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, you may continue work in unaffected areas reasonably believed to be safe. You must immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and you will be compensated for the delay in conformance with the provisions in Section 8-1.07.
Comply with the requirements of the permits acquired by the County for this project located elsewhere in these special provisions.
You must comply with all applicable San Joaquin Valley Unified Air Pollution Control District (SJVAPCD) regulations and requirements.

If applicable, obtain a Demolition Permit Release from SJVAPCD. Nothing herein or elsewhere within these special provisions shall be construed as limiting your responsibility for complying with all applicable rules and regulations. You are responsible for payment of all the fees required to obtain the Demolition Permit Release.

For projects that will result in land disturbance of greater than one acre file the Notice of Intent and pay the appropriate fee as required by the terms of General Permit No. CSA000002, for the discharge of storm water associated with construction activity.

Payment for conforming to the requirements in these permits shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

END OF SECTION 003146

PROJECT MANUAL

Tulare County Transit Operations & Maintenance Facility (TOMF) - CNG

14004 Avenue 256
Visalia, CA

Construction Documents

LICENSED ARCHITECT
PATRICIA M. THORNTON
C-33332
REN. 11/30/2019
2/22/2019
STATE OF CALIFORNIA

PREPARED FOR:
TULARE COUNTY

February 22, 2019
AW Job No. 2015.134

Arrington Watkins Architects
5240 N. 16th Street
Suite 101
Phoenix, Arizona 85016
Telephone: (602) 279-4373
Fax: (602) 279-9110

TABLE OF CONTENTS

DIVISION 21 - FIRE SUPPRESSION

NOT USED

DIVISION 22 - PLUMBING

NOT USED

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

NOT USED

DIVISION 26 - ELECTRICAL

REGISTERED PROFESSIONAL ENGINEER BRYAN A. GLASS No. E 17773 ELECTRICAL STATE OF CALIFORNIA

Date: 2/22/2019

DIVISION 27 - COMMUNICATIONS

NOT USED

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

NOT USED

DIVISION 31 - EARTHWORK

REGISTERED PROFESSIONAL ENGINEER GARTH A. PECCHENINO No. 52678 CIVIL STATE OF CALIFORNIA

Date: 2/22/2019

DIVISION 32 - EXTERIOR IMPROVEMENTS

REGISTERED PROFESSIONAL ENGINEER MONIQUE C. MELLO NO. 74523 CIVIL STATE OF CALIFORNIA

Date: 2/22/2019

DIVISION 33 - UTILITIES

NOT USED

DIVISION 43 - PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

END TABLE OF CONTENTS

SECTION 01 00 00

SITE USE AND SECURITY REQUIREMENTS

PART 1 - GENERAL

1.01 CONSTRUCTION SITE

A. Safety and security must be maintained at all times, on the Construction Site and lay down areas. It is the Contractor's responsibility to coordinate construction activities that may affect County operations or any surrounding business. A twenty-four (24) hour advance written notice shall be given to the Owner or Owner's Representative for any activities or conditions that may affect operations, personnel, or clients.

B. The Construction Site is the area to be enclosed within temporary construction fences erected by the Contractor to separate and secure the construction activities from the Public.

C. Access to Construction Site shall be provided in accordance with requirements of Section 01 5000 – Temporary Facilities and Controls.

D. Internal security for remodeling shall be provided.

PART 2 - FACILITY ENTRY/EXIT REQUIREMENTS

2.01 Access for County business must be maintained.

2.02 Weapons, drugs and alcohol cannot be brought onto County property or the Construction Site.

2.03 Safety and security for all tools, equipment and stored or in-place materials on the site are the responsibility of the Contractor. The owner assumes no liability for loss or damage to tools or equipment.

2.04 Contractor must immediately report any major losses or major unexplained damages to equipment to the Owner or Owner's Representative.

2.05 Contractor's and construction personnel shall not talk to or interact with the media for any reason without prior written approval for the Owner or Owner's Representative.

2.06 The County reserves the right to inspect lunch boxes, toolboxes, clothing and equipment of any and all construction personnel permitted into existing secured areas.

2.07 The County reserves the right to require immediate removal of any worker or employee from areas deemed to be considered secure in nature.

2.08 The work hours at the site will be agreed upon by the Contractor and Owner.

PART 3 - SITE LIGHTING

3.01 The Contractor shall provide adequate security lighting for the ground floor of the Construction Site throughout the evening and nighttime non-work hours.

PART 4 - DISRUPTIONS TO ELECTRICAL SERVICE

4.01 Electrical service shall be provided in accordance with Section 01 5000 – Temporary Facilities and Controls.

4.02 The Owner or Owner's Representative must have at least twenty-one (21) days advance written notice prior to the electricity being shut off to any area outside of the construction site. At the discretion of the Owner or Owner's Representative, more notice may be required.

4.03 The length of time electricity is off is to be coordinated with the Owner or Owner's Representative and kept to the absolute minimum.

PART 5 - EXCAVATIONS

5.01 The Owner or Owner's Representative must have a minimum of five (5) working days advance written notice prior to any excavation.

5.02 Prior to any excavation, the specific location of all known underground utilities shall be marked.

5.03 Contractor is responsible for the location of all known utilities, on-site and off-site in the location of any excavation.

5.04 The Contractor shall be fully aware of the location of all known shut-off valves, and switches prior to commencing excavation.

5.05 All excavations must be properly marked and barricaded during daylight hours and adequately illuminated, barricaded, and marked during the hours of darkness. All excavations within City rights of way must comply with City of Visalia requirements.

5.06 Based on security and safety issues, more stringent controls may be implemented; however, the Contractor will be advised prior to revisions to this Section.

END OF SECTION

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Work restrictions.
5. Specification and drawing conventions.

B. Related Requirements:
1. Section 01 5000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: "Tulare County Transit Operations & Maintenance Facility (TOMF) - CNG," or "Tulare County Transit Facility (TOMF) - CNG."
1. Project Location: 14001 Avenue 256, Visalia, California.

B. Owner: County of Tulare, California.
1. Owner's Representative: Ross Miller.

C. Architect: Kyle Swanson, Arrington Watkins Architects LLC.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:
1. Construction of a new onsite CNG slow-fill dispensing provided for the buses. Project includes site improvements including paving, and striping, as well as utilities, and CNG equipment as indicated in plans and specifications.

B. Type of Contract.
1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

1.5 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 7 p.m., Monday through Friday, unless otherwise indicated or restricted by the County of Tulare.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
   1. Notify Owner not less than two days in advance of proposed utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
   1. Notify Owner not less than two days in advance of proposed disruptive operations.

E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

1.6 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
   2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
   3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 12 00

MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.

B. Specific requirements for work of each contract are also indicated in individual Specification Sections and on Drawings.

C. Related Requirements:

1. Section 01 1000 "Summary" for the Work covered by the Contract Documents, restrictions on use of Project site, and work restrictions.

1.2 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, the condition at which roofing is insulated and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1.3 PROJECT COORDINATOR

A. Project coordinator shall be responsible for coordination between the General Construction Contract, Plumbing Contract, HVAC Contract and Electrical Contract.

B. Mechanical/electrical coordinator, who shall be under the direction of the Project coordinator, shall be responsible for coordination between the Plumbing Contract, HVAC Contract, and Electrical Contract.

1. Mechanical/electrical coordinator shall be licensed to practice as a professional engineer in location of Project.

1.4 COORDINATION ACTIVITIES

A. Coordination activities of Project coordinator include, but are not limited to, the following:

1. Provide overall coordination of the Work.
2. Coordinate shared access to workspaces.
3. Coordinate product selections for compatibility.
4. Provide overall coordination of temporary facilities and controls.
5. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.

6. Coordinate construction and operations of the Work with work performed by each Contract and separate contracts.
7. Prepare coordination drawings in collaboration with each contractor to coordinate work by more than one contract.
8. Coordinate sequencing and scheduling of the Work including a combined contractors' construction schedule for entire Project.
9. Provide photographic documentation.
10. Provide quality-assurance and quality-control services specified in Section 01 4000 "Quality Requirements."
11. Coordinate sequence of activities to accommodate tests and inspections, and coordinate schedule of tests and inspections.
12. Provide information necessary to adjust, move, or relocate existing utility structures affected by construction.
13. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one contractor has worked.
14. Coordinate cutting and patching.
15. Coordinate protection of the Work.
16. Coordinate firestopping.
17. Coordinate completion of interrelated punch list items.
18. Coordinate preparation of Project record documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
19. Print and submit record documents if installations by more than one contractor are indicated on the same contract drawing or shop drawing.
20. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
21. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.

B. Responsibilities of Project coordinator for temporary facilities and controls include, but are not limited to, the following:

1. Provide common-use field office for use by all personnel engaged in construction activities.
2. Provide telephone service for common-use facilities.

1.5 GENERAL REQUIREMENTS OF CONTRACTS

A. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.

1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
2. Trenches and other excavation for the work of each contract shall be the work of each contract for its own work.
3. Blocking, backing panels, sleeves, and metal fabrication supports for the work of each contract shall be the work of each contract for its own work.
4. Furnishing of access panels for the work of each contract shall be the work of each contract for its own work. Installation of access panels shall be the work of the General Construction Contract.

5. Equipment pads for the work of each contract shall be the work of each contract for its own work.
6. Roof-mounted equipment curbs for the work of each contract shall be the work of the General Construction Contract.
7. Painting for the work of each contract shall be the work of the General Construction Contract.
8. Cutting and Patching: Each contract shall perform its own cutting; patching shall be under the General Construction Contract.
9. Through-penetration firestopping for the work of each contract shall be provided by each contract for its own work.
10. Contractors' Startup Construction Schedule: Within five working days after startup horizontal bar-chart-type construction schedule submittal has been received from Project coordinator, submit a matching startup horizontal bar-chart schedule showing construction operations sequenced and coordinated with overall construction.

B. Substitutions: Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with remainder of the work.

1. The General Construction Contract shall coordinate substitutions.

C. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Section 01 5000 "Temporary Facilities and Controls," each contractor is responsible for the following:

1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
3. Its own field office, complete with necessary furniture, utilities, and telephone service.
4. Its own storage and fabrication sheds.
5. Temporary enclosures for its own construction activities.
6. Staging and scaffolding for its own construction activities.
7. General hoisting facilities for its own construction activities, up to 2 tons (2000 kg).
8. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
9. Progress cleaning of work areas affected by its operations on a daily basis.
10. Secure lockup of its own tools, materials, and equipment.
11. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.

D. Temporary Heating, Cooling, and Ventilation: The General Construction Contractresponsible for temporary heating, cooling, and ventilation before weathertight enclosure of building is complete. The HVAC Contract is responsible for temporary heating, cooling, and ventilation after permanent enclosure of building is complete.

E. Use Charges: Comply with the following:

1. Sewer Service: Include the cost for sewer service use by all parties engaged in construction activities at Project site in the Plumbing Contract.
2. Water Service: Include the cost for water service, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site in the Plumbing Contract.

3. Electric Power Service: Include the cost for electric power service, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site in the Electrical Contract.

1.6 GENERAL CONSTRUCTION CONTRACT

A. Work in the General Construction Contract includes, but is not limited to, the following:

1. Remaining work not identified as work under other contracts.

B. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:

1. Temporary facilities and controls that are not otherwise specifically assigned to the Plumbing Contract, HVAC Contract, and Electrical Contract.

1.7 PLUMBING CONTRACT

A. Work in the Plumbing Contract includes, but is not limited to, the following:

1. Plumbing connections to equipment furnished by the General Construction Contract, HVAC Contract, and Electrical Contract.

B. Temporary facilities and controls in the Plumbing Contract include, but are not limited to, the following:

1. Plumbing connections to existing systems and temporary facilities and controls furnished by the General Construction Contract, HVAC Contract, and Electrical Contract.

1.8 HVAC CONTRACT

A. Work in the HVAC Contract includes, but is not limited to, the following:

1. Mechanical connections to equipment furnished by the General Construction Contract, Plumbing Contract, and Electrical Contract.

B. Temporary facilities and controls in the HVAC Contract include, but are not limited to, the following:

1.9 ELECTRICAL CONTRACT

A. Work in the Electrical Contract includes, but is not limited to, the following:

1. Electrical connections to equipment furnished by the General Construction Contract, Plumbing Contract, and HVAC Contract.

B. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:

1. Electrical connections to existing systems and temporary facilities and controls furnished by the General Construction Contract, Plumbing Contract and HVAC Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use facsimile of form provided in Project Manual.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Certificates and qualification data, where applicable or requested.
      g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
      h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
      i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
      j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
      k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

b. Requested substitution will not adversely affect Contractor's construction schedule.

c. Requested substitution has received necessary approvals of authorities having jurisdiction.

d. Requested substitution is compatible with other portions of the Work.

e. Requested substitution has been coordinated with other portions of the Work.

f. Requested substitution provides specified warranty.

g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed unless otherwise indicated.

C. Substitutions for Convenience: Architect will consider requests for substitution if received within 90 days after the Notice to Proceed.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Requested substitution will not adversely affect Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.
i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

Arrington Watkins Architects

PRIOR APPROVAL REQUEST FORM
(During the Bidding Phase)

Project: Tulare County Transit Operations & Maintenance Facility (TOMF) - CNG

Substitution Request Number: _____

From: _____

To: _____

Date: _____

A/E Project Number: AW 2015.134

Re: _____

Contract For: _____

Specification Title: _____

Description: _____

Section: _____ Page: _____

Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Website: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Will changes be required to building design (architecturally, structurally, mechanically, or electrically) in order to properly install proposed substitution? ☐ Yes ☐ No

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation. ☐ Yes ☐ No

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Website: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 013300.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 013300.
☐ Substitution Rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by:

Date:

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SUBSTITUTION REQUEST FORM
(After the Bidding Phase)

Project: Tulare County Transit Operations & Maintenance Facility (TOMF)

Substitution Request Number: _____

From: _____

To: _____

Date: _____

A/E Project Number: AW 2015.134

Re: _____

Contract For: _____

Specification Title: _____

Description: _____

Section: _____ Page: _____

Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Website: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New Product ☐ 2-5 Years Old ☐ 5-10 Years Old ☐ More than 10 Years Old

Differences between Proposed Substitution and Specified Product: _____

_____

Point by point comparative data attached - REQUIRED by A/E

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of work: ☐ Yes ☐ No Explain: _____

_____

Savings to Owner for accepting Substitution:_____Dollars ($_____)

Proposed substitution changes contract time: ☐ Yes ☐ No [Add] [Deduct]_____days

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 013300.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 013300.
☐ Substitution Rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on "Architect's Supplemental Instructions" form.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
   2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      e. Quotation Form: Use forms acceptable to Architect.

B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4. Include costs of labor and supervision directly attributable to the change.
   5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and

finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Section 01 2500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Work Change Proposal Request Form: Use form acceptable to Architect.

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
   1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INTERPRETATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Administrative requirements for requests for information / interpretation.

1.2 DEFINITIONS

A. Request For Information / Interpretation (RFI):
1. A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as RFI.
2. A properly prepared request for information / interpretation shall include a detailed written statement that indicates the specific Drawings or Specification in need of clarification and the nature of the clarification requested.
   a. Drawings shall be identified by drawing number and location on the drawing sheet.
   b. Specifications shall be identified by Section number, page and paragraph.
3. Requests for Information: Request made by Contractor concerning items not indicated on drawings or contained in Project Manual that is required to properly perform the work.
4. Requests for Interpretation: Request made by Contractor in accordance with Owner's Representative's third party obligations to the contract for construction.

B. Improper RFI's:
1. RFI's that are not properly prepared.
2. Improper RFI's will be processed by the Architect at the Architect's standard hourly rate and Architect will charge the Owner, and such costs will be deducted from monies still due the Contractor. The Contractor will be notified by the Architect prior to the processing of improper RFI's.

C. Frivolous RFI's:
1. RFI's that request information that is clearly shown on the Contract Documents.
2. Frivolous RFI's may be returned unanswered or may be processed by the Architect at the Architect's standard hourly rate and Architect will charge the Owner, and such costs will be deducted from monies still due the Contractor. The Contractor will be notified by the Architect prior to the processing of frivolous RFI's.

1.3 CONTRACTOR'S REQUESTS FOR INFORMATION

A. RFI's shall be submitted on Document 00 6313 included in the Project Manual.
1. Forms shall be completely filled in, and if prepared by hand, shall be fully legible after photocopying or transmission by facsimile (fax).
2. RFI's shall be submitted in numerical order with no breaks in the consecutive numbering.
3. Each page of attachments to RFI's shall bear the RFI number and shall be consecutively numbered in chronological order.
4. RFI's may be submitted by E-Mail.
   a. Submittal by E-Mail is the preferred method of submittal.

b. Address for E-Mail will be distributed by the Architect at the Pre-Construction Conference.

c. An electronic version of Document 00 6313 will be provided upon request.

B. When the Contractor is unable to determine from the Contract Documents, the material, process or system to be installed, the Architect shall be requested to make a clarification of the indeterminate item.

1. Wherever possible, such clarification shall be requested at the next appropriate project meeting, with the response entered into the meeting minutes. When clarification at the meeting is not possible, either because of the urgency of the need, or the complexity of the item, Contractor shall prepare and submit an RFI to the Architect.
2. RFI requesting clarification of an item required of a document known to have been prepared by a consultant to the Architect, may be sent directly to the consultant with a copy to the Architect, if this direct communication is approved by the Architect.

C. Contractor shall endeavor to keep the number of RFI's to a minimum. In the event that the process becomes unwieldy, in the opinion of the Architect, because of the number and frequency of RFI's submitted, the Architect may require the Contractor to abandon the process and submit future requests as either submittals, substitutions or requests for change.

D. RFI's shall be originated by the Contractor.

1. RFI's from subcontractors or material suppliers shall be submitted through, reviewed by, and signed by the Contractor prior to submittal to the Architect.
2. RFI's from subcontractors or material suppliers sent directly to the Owner's Representative, Architect or the Architect's consultants shall not be accepted and will be returned unanswered.

E. Contractor shall carefully study the Contract Documents to assure that the requested information is not available therein. RFI's which request information available in the Contract Documents will be deemed either "improper" or "frivolous" as noted above.

F. In cases where RFI's are issued to request clarification of coordination issues, for example, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar items, the Contractor shall fully lay out a suggested solution using drawings or sketches drawn to scale, and submit same with the RFI. RFI's which fail to include a suggested solution will be returned unanswered with a requirement that the Contractor submit a complete request.

G. RFI's shall not be used for the following purposes:

1. To request approval of submittals
2. To request approval of substitutions,
3. To request changes which are known to entail additional cost or credit. (A Change Order Request form shall be used.)
4. To request different methods of performing work than those drawn and specified.

H. In the event the Contractor believes that a clarification by the Architect results in additional cost or time, Contractor shall not proceed with the work indicated by the RFI until a Change Order (or Construction Change Directive, if applicable to project) is prepared and approved. RFI's shall not automatically justify a cost increase in the work or a change in the project schedule.

1. Answered RFI's shall not be construed as approval to perform extra work.

2. Unanswered RFI's will be returned with a stamp or notation: Not Reviewed.

I. Contractor shall prepare and maintain a log of RFI'S, and at any time requested by the Architect, Contractor shall furnish copies of the log showing outstanding RFI'S. Contractor shall note unanswered RFI's in the log.

J. Contractor shall allow up to 5 working days review and response time for RFI'S, unless review is required of multiple consultants, then the review and response period shall be 7 working days.
   1. The Architect will endeavor to respond in a timely fashion to RFI's.
   2. RFI shall state requested date/time for response, however, this requested date/time for response is not a guarantee that the RFI will be answered by that date/time if that date/time is too expeditious

1.4 ARCHITECT'S RESPONSE TO RFI'S

A. Architect will respond to RFI's on one of the following forms:
   1. Properly prepared RFI's:
      a. Response directly upon Request for Information / Interpretation form.
      b. Architect's Supplemental Instruction.
      c. Request for Proposal.
   2. Improper or Frivolous RFI's
      a. Notification of Processing Fee(s).
      b. Unanswered RFI's will be returned with a stamp or notation: Not Reviewed.
   3. Answers to properly prepared RFI's may or may not be made directly upon the RFI form as deemed appropriate by the Architect.

B. Architect may opt to retain RFI's for discussion during regularly scheduled project meetings for inclusion of responses in meeting minutes in lieu of responding on a written form.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

DOCUMENT 00 6313

REQUEST FOR INTERPRETATION FORM

Project: Tulare County Transit Facility (TOMF)
14004 Avenue 256
Visalia, California

R.F.I Number: _____

From: _____

To: Arrington Watkins Architects LLC

Date: _____

5240 N 16th St, Phoenix AZ 85016

A/E Project Number: 2015.134

Specification Section: Paragraph: Drawing Reference: Detail

Request:

* Requested Date/Time for Response:

Signed by:

Response:

☐ Attachments

Response From: To: * Date Rec'd: * Date Ret'd:

Signed by:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ File

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* Contractor shall allow up to 5 working days review and response time for RFI'S, unless review is required of multiple consultants, then the review and response period shall be 7 working days..

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SCHEDULE OF VALUES

A. With first Application for Payment, submit three (3) copies of completed AIA Document G703 Continuation Sheet indicating the scheduled value of major categories and subcontracts for the Work, for approval of the Architect.

B. For each item, provide a column for listing:
1. Item number
2. Description of Work
3. Scheduled Value
4. Previous Applications
5. Work in Place and Stored Materials under this Application
6. Authorized Change Orders
7. Total Completed and Stored to Date of Application
8. Percentage of Completion
9. Balance to Finish
10. Retainage.

C. For identification, include the following Project Identification:
1. Project name and location
2. Project number
3. Owner's name and location
4. Architect's name and location

1.2 PAY REQUEST

A. The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by approved AIA Document G703, Continuation Sheet. A minimum of three (3) original copies of these forms shall be submitted for each application. Submit additional copies if requested by the Owner or Architect.
1. Present required information in typewritten form or on electronic media printout.
2. Execute certification by signature of authorized officer.
3. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
4. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.

B. With each Application for Payment submit lien releases for the previous payment, substantiation for stored materials, monthly progress reports and updates, and any other pertinent items required by the Owner or Architect and identified during the Pre-Construction Conference.
1. AIA Documents G706, Contractor's Affidavit of Payment of Debts and Claims, G706-A, Contractor's Affidavit of Release of Liens, Documents G707, Consent of Surety Company to Final Payment shall be used.
2. If appropriate, G707-A, Consent of Surety to Reduction in or Partial Release of Retainage shall be used.

C. When acceptable to the Owner, the Contractor may submit for payment on properly stored materials not yet incorporated into the work. Materials stored on the site must be in a secured area and be protected from damage, weather, theft or vandalism. The Contractor shall be responsible for replacing any damaged or missing materials.

D. Materials stored off the job site must be in the supplier's storage area, separated from other materials, and clearly labeled for this particular project. Insurance certificates for the material naming the Owner as an additional insured, loss payee shall be delivered with the pay request.

E. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule.
4. Submittal schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
7. Initial progress report.
8. Report of preconstruction conference.
9. Certificates of insurance and insurance policies.

F. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

G. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Consult Owner about the need for additional affidavits and other requirements.
2. Evidence of completion of Project closeout requirements.
3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
4. Updated final statement, accounting for final changes to the Contract Sum.
5. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
6. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
7. Retain first subparagraph below if a surety is involved.
8. AIA Document G707-1994, "Consent of Surety to Final Payment."
9. Evidence that claims have been settled.
10. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
11. Final liquidated damages settlement statement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Coordination drawings.
   2. Project meetings.

1.2 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid.
   2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
   3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
   4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
   5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
   6. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.

1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Tentative construction schedule.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for RFIs.
   g. Procedures for testing and inspecting.
   h. Procedures for processing Applications for Payment.
   i. Distribution of the Contract Documents.
   j. Submittal procedures.
   k. Preparation of record documents.
   l. Use of the premises.
   m. Work restrictions.
   n. Working hours.
   o. Owner's occupancy requirements.
   p. Responsibility for temporary facilities and controls.
   q. Procedures for moisture and mold control.
   r. Procedures for disruptions and shutdowns.
   s. Construction waste management and recycling.
   t. Parking availability.
   u. Office, work, and storage areas.
   v. Equipment deliveries and priorities.
   w. First aid.
   x. Security.
   y. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. Contract Documents.
   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.

g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at weekly intervals.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      1) Review schedule for next period.
   b. Review present and future needs of each entity present, including the following:
      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Progress cleaning.
      10) Quality and work standards.

11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Contractor's construction schedule.
   2. Construction schedule updating reports.
   3. Daily construction reports.
   4. Site condition reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
   1. Working electronic copy of schedule file, where indicated.
   2. PDF electronic file.

B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
   1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration,

remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at weekly intervals.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work under More Than One Contract: Include a separate activity for each contract.
   3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
   4. Work Restrictions: Show the effect of the following items on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.
   5. Work Stages: Indicate important stages of construction for each major portion of the Work.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
   1. Unresolved issues.
   2. Unanswered Requests for Information.
   3. Rejected or unreturned submittals.
   4. Notations on returned submittals.
   5. Pending modifications affecting the Work and Contract Time.

F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Startup Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
   1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.
      a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
   2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
   3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Purchase of materials.
    d. Delivery.
    e. Fabrication.
    f. Utility interruptions.
    g. Installation.
    h. Work by Owner that may affect or be affected by Contractor's activities.
    i. Testing.
    j. Punch list and final completion.
    k. Activities occurring following final completion.
2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.

F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

2.3 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
   1. List of subcontractors at Project site.
   2. List of separate contractors at Project site.
   3. Approximate count of personnel at Project site.
   4. Equipment at Project site.
   5. Material deliveries.
   6. High and low temperatures and general weather conditions, including presence of rain or snow.
   7. Accidents.
   8. Meetings and significant decisions.
   9. Unusual events.
   10. Stoppages, delays, shortages, and losses.
   11. Meter readings and similar recordings.
   12. Emergency procedures.
   13. Orders and requests of authorities having jurisdiction.
   14. Change Orders received and implemented.
   15. Construction Change Directives received and implemented.
   16. Services connected and disconnected.
   17. Equipment or system tests and startups.
   18. Partial completions and occupancies.
   19. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
   1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawing and Project record drawings.
      a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
      b. Contractor shall execute a data licensing agreement in the form of supplied by the Architect.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension

of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 7 days for review of each resubmittal.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-06 1000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-06 1000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name of Construction Manager.
   e. Name of Contractor.
   f. Name of firm or entity that prepared submittal.
   g. Names of subcontractor, manufacturer, and supplier.
   h. Category and type of submittal.
   i. Submittal purpose and description.
   j. Specification Section number and title.
   k. Specification paragraph number or drawing designation and generic name for each of multiple items.
   l. Drawing number and detail references, as appropriate.
   m. Location(s) where product is to be installed, as appropriate.
   n. Related physical samples submitted directly.
   o. Indication of full or partial submittal.
   p. Transmittal number[, numbered consecutively].
   q. Submittal and transmittal distribution record.
   r. Other necessary identification.
   s. Remarks.

E. Options: Identify options requiring selection by Architect.

F. Deviations: Identify deviations from the Contract Documents on submittals.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:
1. Post electronic submittals as PDF electronic files directly to Architect's FTP site specifically established for Project.
   a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:
   a. PDF electronic file..

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings in the following format:
   a. PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.

1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Contractor's Construction Schedule: Comply with requirements specified in Section 01 3200 "Construction Progress Documentation."

F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 2900 "Payment Procedures.

G. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 4000 "Quality Requirements."

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 "Closeout Procedures."

I. Maintenance Data: Comply with requirements specified in Section 01 7823 "Operation and Maintenance Data."

J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

K. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

M. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

P. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

Q. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

R. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

S. Schedule of Tests and Inspections: Comply with requirements specified in Section 01 4000 "Quality Requirements."

T. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

U. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

V. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

W. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 7700 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
   3. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
   1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
   1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
   2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
   1. Date of issue.
   2. Project title and number.

3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. Other required items indicated in individual Specification Sections.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
   2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
      d. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.

   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
   2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
      a. Allow seven days for initial review and each re-review of each mockup.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   6. Demolish and remove mockups when directed unless otherwise indicated.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
   2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as

requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

1.	AABC	Associated Air Balance Council; www.aabc.com.
2.	AAMA	American Architectural Manufacturers Association; www.aamanet.org.
3.	AAPFCO	Association of American Plant Food Control Officials; www.aapfco.org.
4.	AASHTO	American Association of State Highway and Transportation Officials; www.transportation.org.
5.	AATCC	American Association of Textile Chemists and Colorists; www.aatcc.org.
6.	ABMA	American Bearing Manufacturers Association; www.americanbearings.org.
7.	ACI	American Concrete Institute; (Formerly: ACI International); www.concrete.org.
8.	ACPA	American Concrete Pipe Association; www.concrete-pipe.org.
9.	AEIC	Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
10.	AF&PA	American Forest & Paper Association; www.afandpa.org.
11.	AGA	American Gas Association; www.aga.org.
12.	AHAM	Association of Home Appliance Manufacturers; www.aham.org.
13.	AHRI	Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
14.	AI	Asphalt Institute; www.asphaltinstitute.org.
15.	AIA	American Institute of Architects (The); www.aia.org.
16.	AISC	American Institute of Steel Construction; www.aisc.org.
17.	AISI	American Iron and Steel Institute; www.steel.org.
18.	AITC	American Institute of Timber Construction; www.aitc-glulam.org.
19.	AMCA	Air Movement and Control Association International, Inc.; www.amca.org.
20.	ANSI	American National Standards Institute; www.ansi.org.
21.	AOSA	Association of Official Seed Analysts, Inc.; www.aosaseed.com.
22.	APA	APA - The Engineered Wood Association; www.apawood.org.
23.	APA	Architectural Precast Association; www.archprecast.org.
24.	API	American Petroleum Institute; www.api.org.
25.	ARI	Air-Conditioning & Refrigeration Institute; (See AHRI).
26.	ARI	American Refrigeration Institute; (See AHRI).
27.	ARMA	Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
28.	ASCE	American Society of Civil Engineers; www.asce.org.
29.	ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
30.	ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org
31.	ASME	ASME International; (American Society of Mechanical Engineers); www.asme.org.
32.	ASSE	American Society of Safety Engineers (The); www.asse.org.

33.	ASSE	American Society of Sanitary Engineering; www.asse-plumbing.org.
34.	ASTM	ASTM International; (American Society for Testing and Materials International); www.astm.org.
35.	ATIS	Alliance for Telecommunications Industry Solutions; www.atis.org.
36.	AWEA	American Wind Energy Association; www.awea.org.
37.	AWI	Architectural Woodwork Institute; www.awinet.org.
38.	AWMAC	Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
39.	AWPA	American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40.	AWS	American Welding Society; www.aws.org.
41.	AWWA	American Water Works Association; www.awwa.org.
42.	BHMA	Builders Hardware Manufacturers Association; www.buildershardware.com.
43.	BIA	Brick Industry Association (The); www.gobrick.com.
44.	BICSI	BICSI, Inc.; www.bicsi.org.
45.	BIFMA	BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46.	BOCA	BOCA; (Building Officials and Code Administrators International Inc.); (See ICC).
47.	CDA	Copper Development Association; www.copper.org.
48.	CEA	Consumer Electronics Association; www.ce.org.
49.	CFFA	Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
50.	CFSEI	Cold-Formed Steel Engineers Institute; www.cfsei.org.
51.	CGA	Compressed Gas Association; www.cganet.com.
52.	CISCA	Ceilings & Interior Systems Construction Association; www.cisca.org.
53.	CISPI	Cast Iron Soil Pipe Institute; www.cispi.org.
54.	CLFMI	Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
55.	CPA	Composite Panel Association; www.pbmdf.com.
56.	CRI	Carpet and Rug Institute (The); www.carpet-rug.org.
57.	CRRC	Cool Roof Rating Council; www.coolroofs.org.
58.	CRSI	Concrete Reinforcing Steel Institute; www.crsi.org.
59.	CSA	CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
60.	CSI	Construction Specifications Institute (The); www.csinet.org.
61.	CSSB	Cedar Shake & Shingle Bureau; www.cedarbureau.org.
62.	CTI	Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
63.	CWC	Composite Wood Council; (See CPA).
64.	DASMA	Door and Access Systems Manufacturers Association; www.dasma.com.
65.	DHI	Door and Hardware Institute; www.dhi.org.
66.	ECA	Electronic Components Association; www.ec-central.org.
67.	ECAMA	Electronic Components Assemblies & Materials Association; (See ECA).
68.	EIA	Electronic Industries Alliance; (See TIA).
69.	EIMA	EIFS Industry Members Association; www.eima.com.
70.	EJMA	Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
71.	ESD	ESD Association; (Electrostatic Discharge Association); www.esda.org.
72.	ESTA	Entertainment Services and Technology Association; (See PLASA).

73.	EVO	Efficiency Valuation Organization; www.evo-world.org.
74.	FM Approvals	FM Approvals LLC; www.fmglobal.com.
75.	FM Global	FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
76.	FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
77.	FSA	Fluid Sealing Association; www.fluidsealing.com.
78.	FSC	Forest Stewardship Council U.S.; www.fscus.org.
79.	GA	Gypsum Association; www.gypsum.org.
80.	GANA	Glass Association of North America; www.glasswebsite.com.
81.	GS	Green Seal; www.greenseal.org.
82.	HI	Hydraulic Institute; www.pumps.org.
83.	HI/GAMA	Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
84.	HMMA	Hollow Metal Manufacturers Association; (See NAAMM).
85.	HPVA	Hardwood Plywood & Veneer Association; www.hpva.org.
86.	HPW	H. P. White Laboratory, Inc.; www.hpwhite.com.
87.	IAPSC	International Association of Professional Security Consultants; www.iapsc.org.
88.	IAS	International Approval Services; (See CSA).
89.	ICBO	International Conference of Building Officials; (See ICC).
90.	ICC	International Code Council; www.iccsafe.org.
91.	ICEA	Insulated Cable Engineers Association, Inc.; www.icea.net.
92.	ICPA	International Cast Polymer Alliance; www.icpa-hq.org.
93.	ICRI	International Concrete Repair Institute, Inc.; www.icri.org.
94.	IEC	International Electrotechnical Commission; www.iec.ch.
95.	IEEE	Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
96.	IES	Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
97.	IESNA	Illuminating Engineering Society of North America; (See IES).
98.	IEST	Institute of Environmental Sciences and Technology; www.iest.org.
99.	IGMA	Insulating Glass Manufacturers Alliance; www.igmaonline.org.
100.	IGSHPA	International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
101.	ILI	Indiana Limestone Institute of America, Inc.; www.iliai.com.
102.	Intertek	Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
103.	ISFA	International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
104.	ISO	International Organization for Standardization; www.iso.org.
105.	ISSFA	International Solid Surface Fabricators Association; (See ISFA).
106.	ITU	International Telecommunication Union; www.itu.int/home.
107.	KCMA	Kitchen Cabinet Manufacturers Association; www.kcma.org.
108.	LMA	Laminating Materials Association; (See CPA).
109.	LPI	Lightning Protection Institute; www.lightning.org.
110.	MBMA	Metal Building Manufacturers Association; www.mbma.com.
111.	MCA	Metal Construction Association; www.metalconstruction.org.
112.	MFMA	Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
113.	MFM	Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
114.	MHIA	Material Handling Industry of America; www.mhia.org.
115.	MIA	Marble Institute of America; www.marble-institute.com.

116.	MMPA	Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
117.	MPI	Master Painters Institute; www.paintinfo.com.
118.	MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
119.	NAAMM	National Association of Architectural Metal Manufacturers; www.naamm.org.
120.	NACE	NACE International; (National Association of Corrosion Engineers International); www.nace.org.
121.	NADCA	National Air Duct Cleaners Association; www.nadca.com.
122.	NAIMA	North American Insulation Manufacturers Association; www.naima.org.
123.	NBGQA	National Building Granite Quarries Association, Inc.; www.nbgqa.com.
124.	NCAA	National Collegiate Athletic Association (The); www.ncaa.org.
125.	NCMA	National Concrete Masonry Association; www.ncma.org.
126.	NEBB	National Environmental Balancing Bureau; www.nebb.org.
127.	NECA	National Electrical Contractors Association; www.necanet.org.
128.	NeLMA	Northeastern Lumber Manufacturers Association; www.nelma.org.
129.	NEMA	National Electrical Manufacturers Association; www.nema.org.
130.	NETA	InterNational Electrical Testing Association; www.netaworld.org.
131.	NFHS	National Federation of State High School Associations; www.nfhs.org.
132.	NFPA	NFPA; (National Fire Protection Association); www.nfpa.org.
133.	NFPA	NFPA International; (See NFPA).
134.	NFRC	National Fenestration Rating Council; www.nfrc.org.
135.	NHLA	National Hardwood Lumber Association; www.nhla.com.
136.	NLGA	National Lumber Grades Authority; www.nlga.org.
137.	NOMMA	National Ornamental & Miscellaneous Metals Association; www.nomma.org.
138.	NRCA	National Roofing Contractors Association; www.nrca.net.
139.	NRMCA	National Ready Mixed Concrete Association; www.nrmca.org.
140.	NSF	NSF International; (National Sanitation Foundation International); www.nsf.org.
141.	NSPE	National Society of Professional Engineers; www.nspe.org.
142.	NSSGA	National Stone, Sand & Gravel Association; www.nssga.org.
143.	NTMA	National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
144.	NWFA	National Wood Flooring Association; www.nwfa.org.
145.	PCI	Precast/Prestressed Concrete Institute; www.pci.org.
146.	PDI	Plumbing & Drainage Institute; www.pdionline.org.
147.	PLASA	PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
148.	RCSC	Research Council on Structural Connections; www.boltcouncil.org.
149.	RFCI	Resilient Floor Covering Institute; www.rfci.com.
150.	SAE	SAE International; (Society of Automotive Engineers); www.sae.org.
151.	SCTE	Society of Cable Telecommunications Engineers; www.scte.org.
152.	SDI	Steel Deck Institute; www.sdi.org.
153.	SD	Steel Door Institute; www.steeldoor.org.
154.	SEFA	Scientific Equipment and Furniture Association; www.sefalabs.com.
155.	SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).

156. SIA Security Industry Association; www.siaonline.org.
157. SJI Steel Joist Institute; www.steeljoist.org.
158. SMA Screen Manufacturers Association; www.smainfo.org.
159. SMACNA Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
160. SPFA Spray Polyurethane Foam Alliance; www.sprayfoam.org.
161. SPIB Southern Pine Inspection Bureau; www.spib.org.
162. SPRI Single Ply Roofing Industry; www.spri.org.
163. SRCC Solar Rating and Certification Corporation; www.solar-rating.org.
164. SSINA Specialty Steel Industry of North America; www.ssina.com.
165. SSPC SSPC: The Society for Protective Coatings; www.sspc.org.
166. STI Steel Tank Institute; www.steeltank.com.
167. SWI Steel Window Institute; www.steelwindows.com.
168. SWPA Submersible Wastewater Pump Association; www.swpa.org.
169. TCA Tilt-Up Concrete Association; www.tilt-up.org.
170. TCNA Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
171. TEMA Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
172. TIA Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
173. TIA/EIA Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
174. TMS The Masonry Society; www.masonrysociety.org.
175. TPI Truss Plate Institute; www.tpinst.org.
176. TPI Turfgrass Producers International; www.turfgrasssod.org.
177. TRI Tile Roofing Institute; www.tileroofing.org.
178. UL Underwriters Laboratories Inc.; www.ul.com.
179. UNI Uni-Bell PVC Pipe Association; www.uni-bell.org.
180. USGBC U.S. Green Building Council; www.usgbc.org.
181. WASTEC Waste Equipment Technology Association; www.wastec.org.
182. WCLIB West Coast Lumber Inspection Bureau; www.wclib.org.
183. WCMA Window Covering Manufacturers Association; www.wcmanet.org.
184. WDMA Window & Door Manufacturers Association; www.wdma.com.
185. WI Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
186. WMMPA Wood Moulding & Millwork Producers Association; (See MMPA).
187. WSRCA Western States Roofing Contractors Association; www.wsrca.com.
188. WPA Western Wood Products Association; www.wwpa.org.
189. IAPMO International Association of Plumbing and Mechanical Officials; www.iapmo.org.
190. ICC International Code Council; www.iccsafe.org.
191. ICC-ES ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. COE Army Corps of Engineers; www.usace.army.mil.
2. CPSC Consumer Product Safety Commission; www.cpsc.gov.
3. DOC Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD Department of Defense; http://dodssp.daps.dla.mil.
5. DOE Department of Energy; www.energy.gov.

6.	EPA	Environmental Protection Agency; www.epa.gov.
7.	FAA	Federal Aviation Administration; www.faa.gov.
8.	FG	Federal Government Publications; www.gpo.gov.
9.	GSA	General Services Administration; www.gsa.gov.
10.	HUD	Department of Housing and Urban Development; www.hud.gov.
11.	LBL	Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; http://eetd.lbl.gov.
12.	OSHA	Occupational Safety & Health Administration; www.osha.gov.
13.	SD	Department of State; www.state.gov.
14.	TRB	Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
15.	USDA	Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16.	USDA	Department of Agriculture; Rural Utilities Service; www.usda.gov.
17.	USDJ	Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18.	USP	U.S. Pharmacopeia; www.usp.org.
19.	USPS	United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

1.	CFR	Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2.	DOD	Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; http://dodssp.daps.dla.mil.
3.	DSCC	Defense Supply Center Columbus; (See FS).
4.	FED-STD	Federal Standard; (See FS).
5.	FS	Federal Specification; Available from Department of Defense Single Stock Point; http://dodssp.daps.dla.mil.
6.	Available from Defense Standardization Program; www.dsp.dla.mil.	
7.	Available from General Services Administration; www.gsa.gov.	
8.	Available from	National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
9.	MILSPEC	Military Specification and Standards; (See DOD).
10.	USAB	United States Access Board; www.access-board.gov.
11.	USATBCB	U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:
1. Section 01 1000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including: Owner's independent vendors installing equipment and cable**,** Architect, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from existing water system is available for use. Contractor will pay for meter and use. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
   3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   1. Locate facilities to limit site disturbance as specified in Section 01 1000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
   1. Install electric power service overhead unless otherwise indicated.
   2. Connect temporary service to Owner's existing power source, as directed by Owner.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

J. Electronic Communication Service: Provide communications means in the primary field office adequate for use by Architect and Owner to access project electronic documents and maintain electronic communications. Equip computer with not less than the following:
   1. Internet Service: Broadband modem, router and ISP, and equipped with hardware firewall.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
   2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
   1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
   2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 31 2000 "Earth Moving."
   3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
   4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 32 1216 "Asphalt Paving."

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

G. Waste Disposal Facilities: Comply with requirements specified in Section 01 7419 "Construction Waste Management and Disposal."

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 7300 "Execution."

I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Comply with requirements of current EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 31 1000 "Site Clearing."

D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways.

E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

F. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
   1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
   2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire prevention program.
   1. Prohibit smoking in construction areas.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
   3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
   4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
   1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   2. Keep interior spaces reasonably clean and protected from water damage.
   3. Discard or replace water-damaged and wet material.
   4. Discard, replace, or clean stored or installed material that begins to grow mold.
   5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
   1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
   2. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 57 23

STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Contractor shall prepare and implement a Storm Water Pollution Prevention Program that complies with the Construction General Permit (CGP), Waste Discharge Requirements Order No. 2009-0009 DWQ (National Pollutant Discharge Elimination System (NPDES) Permit No.CAS000002 prior to commencement of construction activities. The document is available from the State Water Resources Control Board website at: http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml

B. Discharge of pollutants (any substance, material, or waste other than clear, uncontaminated storm water) from the project into the storm drain system is strictly prohibited by the Central Valley Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (Basin Plan).

C. The Storm Water Pollution Prevention Plan shall be prepared by a Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer (QSD). The SWPPP shall be submitted the County for approval following Section 01 3300 – Submittal Procedures.

D. Contractor shall provide all material, labor, equipment for installation, implementation, and maintenance of all surface-water pollution prevention measures. This work includes the following:

1. Provide, place, and install effective measures for preventing runoff of soil, silts, gravel, hazardous chemicals or other materials prohibited by the Central Valley RWQCB from entering the storm water drainage system.
2. Management of on-site construction materials in such a manner as to prevent said materials from contacting storm water or wash water and running off into the storm drain system.
3. Complying with applicable standards and regulations specified herein.
4. Maintain the most current revised Storm Water Pollution Prevention Plan (SWPPP) at the Contractor's work site in hard copy. An electronic copy of the original and each revision shall be forwarded to the County.
5. Installation of Post-Construction Best Management Practices (BMPs), if applicable, in accordance with California Stormwater Quality Association's (CASQA's) *New Development and Redevelopment Stormwater Best Management Practice Handbook* and *Municipal Stormwater Best Management Practice Handbook.*

E. Contractor shall have storm water pollution prevention measures in place and conduct inspections year-round. It is the responsibility of the Contractor to be prepared for a rain event in the non-rainy season, and to be aware of weather predictions.

F. Contractor shall have a certified Qualified SWPPP Practitioner (QSP) oversee all BMP installations and monitoring as required by the CGP.

1.02 SUBMITTALS

A. Initial Permit Registration Documents (PRDs):
   1. Notice of Intent (NOI).
   2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination): The Contractor shall comply with additional permit requirements which are based on the outcome of the construction project risk determination. These requirements are outlined in the CGP.
   3. Site Map.
   4. SWPPP including a Construction Site Monitoring Program (CSMP) shall be certified by a Qualified SWPPP Developer (QSD) and shall meet the minimum criteria using the SWPPP template in Section 2, Appendix B of the CASQA - Construction BMP Handbook Portal available at http://www.casqa.org/. The SWPPP must contain all required elements specified in the CGP.
   5. County will secure the Annual Permit Fee which is payable to the SWRCB.

B. Additional PRD Requirements:
   1. The Annual Report is due by August 15th of each year. The reporting period is July 1st to June 30th.
      a. Submittal of the report is completed by filling out the Annual Report form in the State Water Resources Control Board's Storm Water Multi-Application Report Tracking System (SMARTS) on-line reporting system.
      b. Records of all inspections and training shall be submitted to the County with the Annual Report.
   2. Notice of Termination (NOT) required within 90 days of when construction is complete. The NOT shall include the following documentation.

      a. Photos showing final site stabilization.
      b. Annual Report for the final reporting period up to the point of when construction was completed.
      c. Post-Construction Water Balance Calculation. The Contractor shall perform a post- construction assessment using the SMARTS CGP post-construction calculator for all non-LUP projects which increase the area impervious surface from pre-project conditions. The NOT shall only be submitted if the post-project Runoff Volume minus Volume Credits are equal or less than the Pre-Project.

C. Site work shall not commence until the initial Permit Registration Documents (PRDs) have been electronically submitted to SMARTS and a WDID number has been issued to confirm coverage under the CGP. PRDs will be reviewed and certified by the County.

PART 2 - PRODUCTS

2.01 MATERIAL

A. General: Provide materials as required for execution of the work.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall ensure that the SWPPP is current. Any change to schedule or BMPs shall be updated in SMARTS within 30 days.

3.02 SWPPP TOPICS

A. The Contractor shall be responsible for the implementation of the SWPPP in accordance with the CGP until an NOT has been filed.

B. Inspections shall be performed weekly, pre-storm, post-storm and at least once each 24-hour period during qualifying storm events by the QSP or a trained representative of the QSP. Non- storm water discharge observations shall be performed quarterly. A qualifying storm event has a 50 percent or greater probability of precipitation. Repairs and design changes to BMPs shall be implemented within 72 hours of identification.

C. Installation of all post-construction BMPs (if applicable) shall be in accordance with CASQA's *New Development and Redevelopment Stormwater Best Management Practice Handbook* and *Municipal Stormwater Best Management Practice Handbook.*

D. Retention of Records - All required storm water records must be maintained by the discharger for 3 years from the date the NOT was approved by the RWQCB. Contractor shall provide copies of stormwater documents, inspections and reports to the County at project completion.

3.03 ENVIRONMENTAL ENFORCEMENT

A. The Central Valley RWQCB has authority to enforce, through codified regulations, any portions of this Section that may violate applicable regulations. Agency enforcement may include but is not limited to: citations, orders to abate, bills for cleanup costs and administration, civil suits, and criminal charges. Contract compliance action by the County shall not be construed to void or suspend any enforcement actions by these or other regulatory agencies.

B. Contractor shall notify the County within 24 hours after issuance of any citation(s) issued by any regulatory agency and shall be responsible for all fines and costs necessary to correct the conditions listed in the citation(s) to include all legal fees and County expenses.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
      a. Form of Approval: As specified in Section 01 3300 "Submittal Procedures."
      b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 3300 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.

3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 7700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the

specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 2500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.

B. Related Requirements:
1. Section 01 1000 "Summary" for limits on use of Project site.
2. Section 01 7700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
3. Section 07 8413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 INFORMATIONAL SUBMITTALS

A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

C. Certified Surveys: Submit two copies signed by land surveyor.

D. Final Property Survey: Submit 2 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions

outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 3100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Contractor or his sub-contractor shall employ a qualified surveyor to lay out the Work using accepted surveying practices.
   1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
   2. Establish limits on use of Project site.
   3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
   4. Inform installers of lines and levels to which they must comply.
   5. Check the location, level and plumb, of every major element as the Work progresses.
   6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
   7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

D. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a

certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 4000 "Quality Requirements"

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 73 20

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Cutting, fitting and patching, required to complete Work, and for:
1. Making several parts fit together properly.
2. Uncovering portions of Work to provide for installation of ill-timed Work.
3. Removing and replacing defective and non-conforming Work.
4. Removing samples of installed Work required for testing, as directed by Architect.
5. Providing routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
6. Attaching new materials to existing remodeling areas.

1.2 SUBMITTALS

A. In advance of executing any cutting or alterations, submit written request to Architect requesting consent to proceed with cutting which affects:
1. Work of Owner or other trades.
2. Structural value or integrity of any element of Project.
3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
4. Efficiency, operational life, maintenance or safety of operational elements.
5. Visual qualities of sight-exposed elements.

B. Include in request:
1. Identification of Project.
2. Description of affected Work.
3. Necessity for cutting, alteration or excavation.
4. Effect of Work of Owner or other trades, or structural or weatherproof integrity of Project.
5. Description of proposed Work:
a. Scope of cutting, patching, alteration, or excavation.
b. Trades which will execute Work.
c. Products proposed to be used.
d. Extent of refinishing to be done.
6. Alternatives to cutting and patching.
7. Cost proposal, when applicable.
8. Written permission of trades whose Work will be affected.

C. Submit written notice to Architect designating time Work will be uncovered to provide for observation.

1.3 PAYMENT FOR COSTS

A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of Architect and Engineer to be paid by Contractor.

B. Cost of Work done on written instructions of Architect, other than defective or nonconforming Work, will be paid by Owner on approval of written Change Order. Provide written cost proposals prior to proceeding with cutting and patching proposed by Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide for replacement of Work removed. Comply with Contract Documents for type of Work standards and Specification requirements for each specific product involved.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect existing conditions of Work, including elements subject to movement or damage during cutting and patching, and excavating and backfilling. After uncovering Work, inspect conditions affecting installation of new products and verify procedures with Architect.

B. Report unsatisfactory or questionable conditions in writing to Architect/Engineer. Do not proceed with Work until further instructions are received.

3.2 PREPARATION

A. Provide shoring, bracing and supports as required to maintain structural integrity of Work.

B. Provide devices and methods to protect other portions of Work from damage, including elements which may be exposed by cutting and patching Work. Maintain excavations free from water.

3.3 ERECTION, INSTALLATION AND APPLICATION

A. Performance:
1. Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
2. Execute cutting and demolition by methods which prevent damage to other Work to provide proper surfaces to receive installation of repairs and new Work.

B. Where practicable, employ installer or fabricator to perform cutting and patching for:
1. Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants and waterproofing.
2. Sight-exposed finished surfaces.

C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes as shown on Drawings and as specified.

D. Fit Work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces. Conform to fire code requirements for penetrations and maintain integrity of fire walls and ceilings.

E. Restore Work which has been cut or removed. Install new products to provide completed Work in accordance with requirements of Contract Documents and as required to match surrounding areas and surfaces.

F. Refinish entire surfaces as necessary to provide an even, matching finish as follows:
   1. Painted Walls or Ceilings: To nearest intersection with another finish or corner.
   2. Where Applied Finishes Occur (i.e. wallcovering, tile, wood paneling): To nearest intersection of finish without damage to adjacent material. Where match of pattern, grain, texture, or similar finish cannot be made, refinish area to intersection with other finish or corner.
   3. Manufactured or Shop Fabricated Materials: Replace entire affected surface or material.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Salvaging nonhazardous demolition and construction waste.
   2. Recycling nonhazardous demolition and construction waste.
   3. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Facilitate recycling and salvage of materials.

1.4 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 30 days of date established for the Notice to Proceed.

1.5 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
   1. Material category.
   2. Generation point of waste.
   3. Total quantity of waste in tons (tonnes).
   4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).

5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. LEED Submittal: LEED letter template for Credit MR 2.1, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

H. Qualification Data: For waste management coordinator.

1.6 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: LEED-Accredited Professional, certified by USGBC. Waste management coordinator may also serve as LEED coordinator.

B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 01 3100 "Project Management and Coordination."

1.7 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
   1. Distribute waste management plan to everyone concerned within three days of submittal return.
   2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
   2. Comply with Section 01 5000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until installation.
   4. Protect items from damage during transport and storage.
   5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to Owner.
   4. Transport items to Owner's storage area designated by Owner.
   5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
   1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
      a. Inspect containers and bins for contamination and remove contaminated materials if found.
   2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
   4. Store components off the ground and protect from the weather.
   5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

A. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
   1. Pulverize concrete to maximum 1-1/2-inch (38-mm) size.

C. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

D. Metals: Separate metals by type.
   1. Structural Steel: Stack members according to size, type of member, and length.
   2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

E. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

F. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

G. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.

H. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
   1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

I. Carpet Tile: Remove debris, trash, and adhesive.
   1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

K. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:
   1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
   2. Polystyrene Packaging: Separate and bag materials.
   3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
   4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:
   1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
   2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
   1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
   1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 77 00

PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 FINAL CLEANING

A. Perform the following special cleaning for trades at completion of Work. Employ experienced workmen or professional cleaners for the final cleaning:
   1. Remove marks, stains, fingerprints, soil and dirt from paint and stain.
   2. Remove spots, soil, paint and mastic and wash.
   3. Clean fixtures, equipment and piping; remove stains, paint, dirt and dust.
   4. Clean concrete walks and slabs of cement droppings, paint and other objectionable materials to present a neat, clean appearance.
   5. Clean exterior and metal surfaces.
   6. Remove oil, stains, dust, dirt, paint and the like from items required to have a polished finish; polish and leave without finger marks or other blemishes.

B. Existing improvements, inside or outside the property which are disturbed, damaged or destroyed by the Work under the Contract shall be restored to the condition in which they originally were, or to the satisfaction of the Architect/Engineer.

1.2 PROJECT RECORD DOCUMENTS

A. As the work progresses, the Contractor shall maintain a complete and accurate record of changes or deviations from the Contract Documents and Shop Drawings, indicating the Work as actually installed. Record information in the appropriate locations on a record set of blue line prints of the Drawings and Shop Drawings and a copy of the Specifications that are maintained solely for the purpose of this documentation. Keep this record set of Contract Documents and Shop Drawings at the project site for review by the Owner and Engineer. Information contained in the record documents shall include, but not be limited to:
   1. Modifications made by Addenda, Change Orders, Construction Change Directives and Engineer's Supplemental Instructions that shall be transferred to the record documents.
   2. Location of site underground pipes, conduits, ducts, cables and similar work, dimensioned horizontally to permanent points of reference and located vertically by indicating depth of burial. Dimensions shall be accurate within +6 inches.
   3. Location of building plumbing piping, sprinkler piping, control valves, heating and air conditioning equipment, mechanical piping, ductwork, major conduit runs, power, control and alarm wiring, etc., dimensioned horizontally to permanent points of reference. Dimensions shall be accurate within 6 inches. By notation, describe the vertical location of the item such as "below slab," "above ceiling," etc.
   4. Modifications made to accommodate field conditions.
   5. Location and function of mechanical and electrical control devices and shut-off valves.
   6. Revise Drawings and panel schedules to show final circuiting of electrical fixtures and equipment.

B Upon Substantial Completion of the Work, deliver the complete set of Record Documents to the Architect for approval. Refer to section 01 7839.

C. Owner's Manual: refer to specification 01 7823.

1.3 SPARE PARTS AND MAINTENANCE MATERIALS

A. Deliver spare parts, tools, extra stocks of material and similar physical items required by individual specification sections to the Owner with a copy of the transmittal to the Engineer. Obtain signed receipts from the Owner for all items.

PART 2 - PRODUCTS

2.1 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1. Refer to the Request for Proposal, Uniform General Terms and Conditions for terms of the period for correction of the Work.

B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the General Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties to not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the General Contractor.

C. Separate Prime Contracts: Each Prime contractor is responsible for warranties related to its own contract.

2.2 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by the standard warranties or to provide greater rights for the Owner.

2.3 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access of correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding; reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty an equitable adjustable for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The General Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether Owner had benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interrupted as limitations on the time in which ADOA can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

2.4 SUBMITTALS

A. Submit written warranties to Owner prior to the date certified for Substantial Completion. If the ADOA's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner.

1. When a designated portion of the Work is completed and occupied or used by Owner, by separate agreement with the General Contractor, during the construction period, submit properly executed warranties to the Owner within 15 days of the completion of that designated portion of the Work.

B. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the General Contractor, or subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

C. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11-inch paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and name, address, and telephone number on the Installer.
2. Identify each binder on the front spine with the typed or printed title "WARRANTIES", Project title of name, and name of the General Contractor.
3. When warranted construction required operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 3 - EXECUTION

3.1 LIST OF WARRANTIES

A. Schedule: Provide warranties on products and installations.

3.2 CORRECTION OF WARRANTY WORK

A. The General Contractor is required to perform warranty repair work. When the General Contractor fails to perform the Warranty Repair Work in accordance with these Contract Documents, Owner may complete the Repair Work and seek reimbursement, for the expenses incurred, from the General Contractor.

B. Owner Project Manager and/or User Agency shall serve as the Warranty Coordinator and shall designate an Alternate Warranty Coordinator who shall have the authority and responsibility to perform the Coordinator's functions when the Coordinator is absent. The Warranty Coordinator shall maintain:
   1. An updated list of all building/systems that are covered by a Warranty.
   2. An updated schedule of all equipment under Warranty and their Warranty period.

C. Before authorizing repairs to. Or replacement of parts on any building/system, the Warranty Coordinator shall determine if a valid Warranty, covering the specific failure, exists. The Warranty Coordinator shall avoid, whenever possible, any action that may void a Warranty.

D. When a valid warranty exists, the Warranty Coordinator shall contact the General Contractor regarding the terms of the Warranty. The Warranty Coordinator shall provide copies of the Warranty Notification to Owner Project Manager, User Agency, the General Contractor and the responsible subcontractors, manufacturers and suppliers.

E. If there is no Warranty covering the specific failure, or if the Warranty has expired, the Warranty Coordinator shall ensure that the necessary repairs/replacements are completed in accordance with the appropriate written instructions.

F. Warranty Coordinator shall evaluate all failures covered by a Warranty and determine the required timeframe for correction based on the urgency of the failure. Failures will be categorized as Emergency, Urgent or General. Upon notification of Warranty work required, the Sub-contractor shall complete the Warranty repair work in the following timeframe:
   1. Emergency repair work within 6 hours
   2. Urgent repair work within 16 hours
   3. General service or repairs within 5 days

G. Emergency failures require immediate action to resolve imminent threats to health, life, safety or a security system failure. When the Warranty Coordinator determines that an emergency situation exists, he/she shall authorize immediate action to control the emergency and prevent greater loss.
   1. Upon determination that the failure is covered by a Warranty, the Coordinator shall complete a Warranty Notification Form, immediately notify the General Contractor and coordinate with the General Contractor for immediate repair.
   2. The Warranty Coordinator may extend the allowable timeframe, provided the General Contractor has submitted a written request and has documented that the problems requiring the time extension are beyond their control. The General Contractor shall reach an agreement with the Warranty Coordinator on the specific repairs to be performed, when the repairs will be completed, and document the agreement in a letter to the recipients of the Warranty Notification.

H. In the event that the General Contractor fails to respond and/or restore the building/systems to operating condition within the specified time period, the Warranty Coordinator will arrange for the work to be performed by qualified personnel/contractors. The General Contractor shall be responsible to reimburse Owner for the expenses incurred.

I. Warranty Coordinator shall monitor all on-site repairs done by any contractor in response to a warranty claim request to ensure compliance with the repair agreement. The Warranty Coordinator shall ensure that each Warranty claim is fully documented.
   1. General Contractor shall assign a representative to walk with Owner Warranty Coordinator to review completed Project at eleven months after Substantial

Completion date. General Contractor shall document any found deficiencies. Items found requiring correction, modification, or Warranty attention shall be documented and resolved as noted in this specification section.

END OF SECTION

WARRANTY NOTIFICATION Warranty File Claim Number _____

To: _____ Facility

_____

_____ Date

_____

Warranty repair service is requested for the following problem:

Problem Description

Equipment involved Equipment ID Number

Location of Problem-Building/Room Number or Area Warranty Coordinator Familiar with Problem

Severity of Problem:

☐ Emergency ☐ Urgent ☐ General

FOLLOW-UP TELEPHONE CALLS:

Called on at

Called on at

Called on at

This request for service will remain an outstanding item until a disposition response including the contractor's representative signature, is received.

CONTRACTOR DISPOSITION:

Date Request Received Time Received

Who Resolved When

Description of Action Taken

Contractor's Representative Signature

Your assistance in obtaining prompt correction of this problem is appreciated.

Sincerely,
Warranty Coordinator

Arrington Watkins Architects

Project Closeout Checklist

Project name: Tulare County Transit Operations & Maintenance Facility (TOMF) - CNG

Owner: County of Tulare, State of California Project Number: AW 2015.134

No.	Description	Responsibility	Date complete
1	Final cleaning – interior		
2	Final cleaning/rubbish removal – site		
3	Remove all temporary site facilities, trailers, etc.		
4	Punch list walk-thru with Owner and A/E; and final walk-thru after completion of punch list items		
5	Secure as-built drawings and specifications from subcontractors		
6	Submit complete set of Record Documents to Architect for approval		
7	Collect all final invoices/billings; complete and deliver final billing		
8	Complete and collect all final lien waivers		
9	Final inspections/secure certificate of occupancy from code body		
10	Contact insurance carrier(s) – policy end		
11	Secure operations and maintenance (O & M) manuals		
12	Secure all product warranties (*may be part of O & M)		
13	Systems start-up and Owner employee demonstration and training programs; submit demonstration and training videos to Owner		
14	Supply Owner with additional material and spare parts per spec		
15	Collect and transfer keys to Owner prior to final keying		
16	Reconcile change orders and retainages		
17	Prepare final Owner's manual(s) per specification		
18	Corrections of warranty work prior to Substantial Completion		
19	Complete final A/E affidavits and closeout documents		
20	Notice of completion/closeout documents from A/E		
21			
22			
23			
24			
25			

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Product maintenance manuals.
   5. Systems and equipment maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:
   1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
      a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
      b. Enable inserted reviewer comments on draft submittals.
   2. One paper copy. Include a complete operation and maintenance directory. Provide paper copy to Owner after PDF version has been reviewed and approved by Architect.

C. Manual Submittal: Submit each manual in final PDF form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return a copy with comments.
   1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.
   3. Manual contents.

C. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for Construction Manager.
   7. Name and contact information for Architect.
   8. Name and contact information for Commissioning Authority.
   9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
   10. Cross-reference to related systems in other operation and maintenance manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
   1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
   2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
   1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine **to** hold label describing contents and with pockets inside covers to hold folded oversize sheets.
      a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
   2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
   3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.

4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
   2. Performance and design criteria if Contractor is delegated design responsibility.
   3. Operating standards.
   4. Operating procedures.
   5. Operating logs.
   6. Wiring diagrams.
   7. Control diagrams.
   8. Piped system diagrams.
   9. Precautions against improper use.
   10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
   1. Product name and model number. Use designations for products indicated on Contract Documents.
   2. Manufacturer's name.
   3. Equipment identification with serial number of each component.
   4. Equipment function.
   5. Operating characteristics.
   6. Limiting conditions.
   7. Performance curves.
   8. Engineering data and tests.
   9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
   1. Startup procedures.
   2. Equipment or system break-in procedures.
   3. Routine and normal operating instructions.
   4. Regulation and control procedures.
   5. Instructions on stopping.
   6. Normal shutdown instructions.
   7. Seasonal and weekend operating instructions.
   8. Required sequences for electric or electronic systems.
   9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:
1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.

F. Comply with Section 01 7700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit copies of record Drawings as follows:
      a. Initial Submittal:
         1) Submit COLOR PDF electronic files of the scanned (paper) record prints.
         2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
      b. Final Submittal:
         1) Submit one paper-copy set(s) of marked-up record prints to the Owner.
         2) Submit COLOR PDF electronic files of the scanned paper record prints to the Architect and Owner.

B. Record Specifications: Submit annotated PDF electronic files or scans of the paper annotated Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Record data as soon as possible after obtaining it.
      c. Record and check the markup before enclosing concealed installations.
   2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
3. Identification: As follows:
a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders and record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.
   3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
   1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within fourteen days of end of each training module.
   1. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.4 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

a. System, subsystem, and equipment descriptions.
b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.
d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:
   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.
5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.

8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 7823 "Operation and Maintenance Data."

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
   2. Owner will furnish an instructor to describe Owner's operational philosophy.
   3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
   1. Schedule training with Owner**,** with at least 14 days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
   1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Architect.

C. Narration: Describe scenes on video recording by audio narration by microphone while recording or dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.

D. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PRE-DEMOLITION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Pre-demolition Photographs or Video: Submit before Work begins.

1.5 CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

F. Storage or sale of removed items or materials on-site is not permitted.

G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

D. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
   1. Comply with requirements for existing services/systems interruptions specified in Section 01 10 00 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
   2. Arrange to shut off indicated utilities with utility companies.
   3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
      a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
      c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
      d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
      e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
      f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
      g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

A. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining

construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:
1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 03 15 12

POST INSTALLED CONCRETE ANCHORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following types of post installed anchors:

1. Expansion anchors.
2. Sleeve anchors.
3. Adhesive anchors.

B. Related Sections:

1. Division 03 Section "Cast-in-Place Concrete."
2. Division 05 Section "Metal Fabrications."

1.3 REFERENCES

A. ACI:

1. ACI 318 – Building Code Requirements for Structural Concrete
2. ACI 355.2 – Standard for Evaluating the Performance of Post-Installed Mechanical Anchors in Concrete

B. ASTM:

1. ASTM A36 – Standard Specification for Carbon Structural Steel
2. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
3. ASTM A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
4. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
5. ASTM A615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
6. ASTM B633 – Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
7. ASTM B695 – Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
8. ASTM C881 – Standard Specification Epoxy-Resin-Based Bonding Systems for Concrete
9. ASTM E488 – Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements

10. ASTM E1512 – Standard Test Methods for Testing Bond Performance of Bonded Anchors
11. ASTM F593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

C. Federal Specifications A-A-1922A, A-A01923A and A-A-55614 for Expansion and Shield-Type Anchors

D. ICC-ES
1. ICC-ES AC70 – Acceptance Criteria for Fasteners Power-Driven into Concrete, Steel and Masonry Elements
2. ICC-ES AC193 – Acceptance Criteria for Mechanical Anchors in Concrete Elements
3. ICC-ES AC308 – Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements

1.4 SUBMITTALS

A. Product Data: For each type of product indicated; include manufacturer's written installation instructions, physical characteristics, and load tables.

B. Evaluation Reports: From ICC-ES or IAPMO ES for each type of post installed anchor indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed post-installed anchor installations similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of not less than 3 years of successful in-service performance.

B. Evaluation Service Approval: Use only products that have current ICC or IAPMO Evaluation Service approval.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to job site in manufacturer's or distributor's packaging undamaged, complete with installation instructions.

B. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage or deterioration.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Carbon and Alloy Steel Nuts: ASTM A563.

B. Carbon Steel Washers: ASTM F436.

C. Carbon Steel Threaded Rod: ASTM F 1554; or ASTM A193 Grade B7; or ISO 898 Class 5.8.

D. Wedge Anchors: ASTM A510; or ASTM A108.

E. Stainless Steel Bolts, Hex Cap Screws, and Studs: ASTM F593.

F. Stainless Steel Nuts: ASTM F594.

G. Zinc Plating: ASTM B633.

H. Hot-Dip Galvanizing: ASTM A153.

2.2 POST INSTALLED ANCHORS

A. Basis of Design: Post installed anchors shall be of manufacturer, type, and size as indicated on Drawings; manufacturers indicated on the Drawings are selected from the following:

1. Hilti Corporation.
2. Simpson Strong-Tie Company.

B. Post Installed Anchors, General:

1. Load Capacity: Capable of sustaining, without failure, a load equal to four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 unless otherwise indicated.
3. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts (Type 304), ASTM F 593, and nuts, ASTM F 594.

C. Expansion Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming to ICC ES AC01 or ICC ES AC193. Type and size as indicated on Drawings.

1. Anchorage to Concrete, provide one of the following:

a. Hilti Kwik Bolt TZ, ICC ESR-1917 (carbon steel and AISI Type 304 Stainless Steel).
b. Simpson Strong-Tie, Strong-Bolt 2 wedge anchor, ICC ESR-3037.

D. Sleeve Anchors: Torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming ICC ES AC193. Type and size as indicated on Drawings.

1. Subject to compliance with requirements, provide one of the following:

a. Hilti; HAD-P Undercut Anchor, ICC ESR-1546.

E. Adhesive Anchors: Two component, all weather, high performance epoxy complying with descriptive requirements of ASTM C 881, Type IV, Grade 3, Classes A, B, and C, except for gel time; mixed and dispensed through motionless, static mixing nozzle and dispensing tool. Threaded steel rod, inserts or reinforcing dowels, complete with nuts, washers, adhesive injection system, and manufacturer's installation instructions. Type and size as indicated on Drawings.

1. Anchorage to Concrete, provide one of the following:

   a. Hilti: Threaded rods or steel reinforcing bars with HIT RE 500 V3 Adhesive Anchoring System, ICC ESR-3814.
   b. Simpson Strong-Tie: Threaded rods or steel reinforcing bars with SET-XP Adhesive Anchorage System, ICC ESR-2508.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install anchors in accordance with manufacturer's written installation instructions and as indicated on Drawings.

B. Drilling Concrete:

1. Base Material Strength: Do not drill holes in concrete until concrete complies with the following for the type of anchor indicated:

   a. Expansion Anchors: Do not drill base material until base material has cured 28 days minimum.
   b. Adhesive Anchors: Do not drill base material until base material has cured 7 days minimum.

2. Drill holes with rotary impact hammer drills using carbide-tipped bits and core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.

   a. Cored Holes: Where anchors are to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer.
   b. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.

C. Wedge Anchors, Sleeve Anchors, and Undercut Anchors: Protect threads from damage during anchor installation. Sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed and replaced unless otherwise directed by the Architect.

D. Cartridge Injection Adhesive Anchors: Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

E. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.

3.3 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Base Material Strength: Do not test anchors until base material has cured for a minimum of 28 days and has achieved design strength.

C. Testing: Each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory. Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Structural Engineer. If any anchor fails testing, all anchors of the same type, diameter, and which were installed by the same trade and not previously tested, shall be tested until twenty (20) consecutive anchors pass, then resume the initial test frequency.

1. Minimum anchor embedments, proof loads and torques shall be as indicated on the Drawings.
2. Torque shall be applied with a calibrated torque wrench.
3. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed D/10, where D is the nominal anchor diameter.
4. Testing frequency shall be per 2013 CBC 1913A.7.3.

   a. Sill Plate Bolting: Test 10 percent of anchors.
   b. Structural Applications other than Sill Plate Bolting: Test all anchors.
   c. Non-Structural Applications (Equipment Anchorage): Test 50 percent or alternate bolts in a group, including at least one-half the anchors in each group, shall be tested.

5. Test acceptance criteria shall be per 2013 CBC 1913A.7.4

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Slabs-on-grade.

B. Related Sections:

1. Division 01 Section “Quality and Testing Requirements” for administrative and procedural requirements for quality assurance including independent testing requirements.
2. Division 26 Sections as applicable to Electrical items embedded in concrete.
3. Division 31 Sections as applicable to earthwork.
4. Division 32 Sections as applicable to concrete paving and site concrete work.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

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

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1. Shop drawings shall be in accordance with ACI SP-66 or CRSI “Manual of Standard Practice.”
2. Mill certificates: Steel producer's certificates of mill analysis, tensile, and bend tests for reinforcing steel. Submit certificates accompanying the Shop Drawings.

D. Construction Joint Layout Shop Drawings: Show locations of proposed construction and control joints other than, or in addition to, those as indicated on the drawings. Location of joints is subject to approval of the Architect.

E. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Curing compounds.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

F. Material Test Reports: For aggregates, from a qualified testing agency, indicating compliance with requirements:

G. Mill certificates: Steel producer's certificates of mill analysis, tensile, and bend tests for reinforcing steel. Submit certificates accompanying the Shop Drawings.

H. Steel Reinforcement Record Drawings: Shop drawings shall be corrected to reflect actual field changes and shall be submitted to the Architect.

I. Delivery Tags: Delivery tags for all concrete.

J. Batch Plant Inspection Waiver: When batch plant inspection waiver is requested, evidence of compliance shall be submitted to, and approved by, the Governing Agency; refer to requirements in Part 3 Article "Field Quality Control."

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills required for work performed under this Section. In actual installation of the work of this Section, use adequate numbers of skilled workmen to insure installation in strict accordance with the contract documents design.

B. Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

C. Testing Agency: An independent agency retained by the Owner, acceptable to the Architect, and qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 318-11, “Building Code Requirements for Structural Concrete” with amendments per 2013 California Building Code, Chapter 19, Section 1905.
3. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

4. Review inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, [steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Identification: Bundle and tag reinforcing steel with grades and suitable identification marks for checking, sorting and placing. Use waterproof tags and markings and do not remove until steel is in place.

1.7 COORDINATION

A. Slab Finishes: Coordinate slab finish requirements with trades installing or applying floor finishes or treatments over slabs. Finishes shall include but not be limited to concrete sealing, topical concrete vapor control barrier, ceramic tile, resinous/fluid applied floor systems, adhered resilient floor systems, and adhered carpet.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Earth Forms: Use for sides of footings only where soil is firm and stable and concrete will not be exposed. Where earth forms are used, cut excavations neat and accurate to size for placing concrete directly against the excavation.

B. Rough-Formed Finished Concrete: Use for formed concrete that will not be exposed in the finished work, fabricate forms of plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Smooth-Formed Finished Concrete: Use for formed concrete that will be exposed in the finished work, fabricate forms of form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. Slabs on Grade and Foundations: Use precast concrete blocks, plastic-coated steel with bearing plates or specifically designed wire-fabric supports fabricated of plastic. Precast blocks shall be not less than 3 inches by 3 inches square and shall have a compressive strength equal to or greater than the strength of the surrounding concrete.

D. Fabricating Reinforcement: Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice" or ACI SP-66 and the details shown on the Drawings.

1. In the case of fabricating errors, do not rebend or straighten reinforcement in a manner that will damage or weaken the material.
2. Bends shall be made cold using pin sizes as recommended ACI 318 as modified by T24, CCR, Part 2.
3. Unacceptable Work: Reinforcement with any of the following defects will not be permitted:

   a. Bar lengths, depths, and bends exceeding specified fabrication tolerance.
   b. Bends or kinks not indicated on the project Drawings or the final Shop Drawings.
   c. Bars with reduced cross-section due to excessive rusting or other cause.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type II, gray.

   a. Fly Ash: ASTM C 618, Class F. The use of a quality fly ash will be permitted as a cement-reducing admixture

B. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source.

1. Where concrete expansion from alkali silica or alkali carbonate reactions is anticipated, provide aggregate with documented service record data of at least 10 years' satisfactory

service in similar applications and service conditions using similar aggregates and cementitious materials.

2. Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the grading requirements of ASTM C33.
3. Coarse aggregate: Coarse aggregate shall consist of a clean, hard, fine grained, sound crushed rock, or washed gravel or a combination of both. It shall be free from oil, organic matter, or other deleterious substances. Aggregate shall be uniformly graded from one-quarter inch size to maximum size.
4. The maximum size of aggregates used in the project shall be consistent with the dimensions and form of the section being placed, the location and spacing of the reinforcing bars, and with the method of compaction, and shall be such as will produce dense and uniform concrete free from rock pockets, honey-comb and other irregularities. The nominal maximum size of the aggregate shall not be more than one-fifth the narrowest dimension between forms, one-third the depth of slabs nor three-fourths the minimum clear spacing between reinforcing bars.
5. Combined Grading: The combined grading shall be such that the percentage by weight of the combined aggregates shall fall within the limits established as follows:

Sieve number or size in inches (maximum)	Percentage by Weight		
	1-1/2”	1”	3/4”
Passing a 2 inch	---	---	---
Passing a 1-1/2 inch	95-100	---	---
Passing a 1 inch	70-90	90-100	---
Passing a 3/4 inch	50-80	70-95	90-100
Passing a 3/8 inch	40-60	45-70	55-75
Passing a No. 4	35-55	35-55	40-60
Passing a No. 8	25-40	27-45	30-46
Passing a No. 16	16-34	20-38	23-40
Passing a No. 30	12-25	12-27	13-28
Passing a No. 50	2-12	5-15	5-15
Passing a No. 100	0-3	0-5	0-5

6. Special grading or size limitations: When reviewed and approved by the Architect, other gradings or maximum size limitations may be used if mixes are designed and tested in accordance with the concrete mixture specified in the “Concrete Mixtures” Article.
7. Soundness of Aggregates: Both the coarse and fine aggregate shall be tested by the use of a solution of sodium or magnesium sulfate, or both, whenever in the judgment of the Architect, such tests are necessary to determine the quality of the material. Such tests shall be performed in accordance with ASTM C88 and the results shall show compliance with the limits set forth in ASTM C33.
8. Reactivity: Aggregates shall be free from any substance which may be deleteriously reactive with the alkalines in the cement in an amount sufficient to cause excessive expansion of the concrete or which will interfere with normal hydration of the cement. Acceptability of the aggregate shall be based upon satisfactory evidence that the aggregate is free from such materials.
9. Aggregates shall be tested, when required by the Architect prior to the concrete mix being established, in accordance with the following specifications:

Test	Specification
Abrasion	ASTM C131 and C535
Gradation	ASTM C136
Alkali Reactivity	ASTM C289 and C227
Organic Impurities	ASTM C40
Clay Lumps	ASTM C142

10. Maximum Coarse-Aggregate Size: Nominal size as indicated on Drawings.
11. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.4 ADMIXTURES

A. Admixtures shall be reviewed and approved by the Architect.

B. Calcium chloride, thiocyanates or admixtures containing more than 0.05% chloride ions are not permitted.

C. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Certification of requirements and chloride ion content is required from the admixture manufacturer prior to mix design review.

1. Air-entraining Admixture: ASTM C260.

   a. Available Products: Subject to compliance with requirements, provide one of the following products:

      1) Euclid Chemical Company (The); Air Mix.
      2) BASF/Master Builders, Inc.; Micro-Air.
      3) Sika Corporation; Sika AER.

2. Water-reducing Admixtures: ASTM C494 Type A.

   a. Available Products: Subject to compliance with requirements, provide one of the following products:

      1) Euclid Chemical Company (The); Eucon WR-75.
      2) BASF/Master Builders Inc.; Pozzolith 220N.
      3) Sika Corporation; Plastocrete 161.

3. Water-reducing, Retarding Admixtures: ASTM C494 Type D.

   a. Available Products: Subject to compliance with requirements, provide one of the following products:

      1) Euclid Chemical Company (The); Eucon Retarder-75.
      2) BASF/Master Builders Inc.; Pozzolith 300 R.
      3) Sika Corporation; Plastiment.

4. High Range Water-Reducing Admixture (HRWR): ASTM C494 type F or G.

   a. Available Products: Subject to compliance with requirements, provide one of the following products:

      1) Euclid Chemical Company (The); Eucon 37.
      2) BASF/Master Builders Inc.; Rheobuild 1000.
      3) Sika Corporation; Sikament 300.

b. When more than 30 minutes is required between the addition of admixtures to final placement of the concrete, a combination of water-reducing, set controlling admixtures (ASTM C494, Types A, D and E) may be used.

5. Non-Corrosive, Non-Chloride Accelerator: ASTM C494 Type C or E.

a. Available Products: Subject to compliance with requirements, provide one of the following products:

1) Euclid Chemical Company (The); Accelguard 80.
2) BASF/Master Builders Inc.; Pozzutec 20+.
3) Sika Corporation, Plastocrete 161FL.

b. The admixture manufacturer shall have long-term (more than one year duration) non-corrosive test data on metal deck and reinforcing steel from an independent testing laboratory using an acceptable accelerated corrosion test method such as using electrical potential measures.

2.5 CURING AND SEALING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Construction Chemicals - Building Systems; Confilm.
b. ChemMasters; SprayFilm.
c. Conspec by Dayton Superior; Aquafilm.
d. Dayton Superior Corporation; Sure Film (J-74).
e. Edoco by Dayton Superior; BurkeFilm.
f. Euclid Chemical Company (The), an RPM company; Eucobar.
g. Lambert Corporation; LAMBCO Skin.
h. L&M Construction Chemicals, Inc.; E-CON.
i. Meadows, W. R., Inc.; EVAPRE.
j. Sika Corporation; SikaFilm.
k. Symons by Dayton Superior; Finishing Aid.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, clear or white polyethylene film, 6 mil minimum thickness, or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Construction Chemicals - Building Systems; Kure 200.
b. ChemMasters; Safe-Cure Clear.
c. Conspec by Dayton Superior; W.B. Resin Cure.
d. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).

e. Edoco by Dayton Superior; Res X Cure WB.
f. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
g. L&M Construction Chemicals, Inc.; L&M Cure R.
h. Meadows, W. R., Inc.; 1100-CLEAR.
i. Symons by Dayton Superior; Resi-Chem Clear.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Construction Chemicals - Building Systems; Kure 1315.
b. ChemMasters; Polyseal WB.
c. Conspec by Dayton Superior; Sealcure 1315 WB.
d. Edoco by Dayton Superior; Cureseal 1315 WB.
e. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
f. Meadows, W. R., Inc.; Vocomp-30.
g. Symons by Dayton Superior; Cure & Seal 31 Percent E.

2. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.7 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.8 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301, ACI 318, Chapter 5, and Chapter 19 of the California Building Code.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

a. The testing agency used for preparing mixture designs shall be different from the testing agency retained by the Owner for testing concrete strength and materials.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 15 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to the following percentages by weight of cement.
1. Reinforced concrete exposed to chloride in service: 0.15 percent.
2. Other reinforced concrete: 0.30 percent.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Proportion normal-weight concrete mixture as indicated on Drawings for strength, slump, water/cement ratio, and maximum aggregate size.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Project site mixing of structural concrete will not be permitted. Project site mixing of concrete for other purposes may be permitted only when reviewed and approved by the Architect. When allowed, measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ACI 318. Mix concrete materials in appropriate drum-type batch machine mixer, the capacity of the mixer shall be such that it will handle one or more full sack batches.

C. Control of Admixtures:

1. Admixtures shall be charged into the mixer as solutions and shall be measured by means of an approved mechanical dispensing device. The liquid shall be considered a part of the mixing water. Admixtures that cannot be added in solution may be weighed or may be measured by volume if so recommended by the manufacturer.
2. If two or more admixtures are used in the concrete, they shall be added separately to avoid possible interaction that might interfere with the efficiency of either admixture or adversely affect the concrete.
3. Addition of retarding admixtures shall be completed within 1 minute after addition of water to the cement has been completed, or prior to the beginning of the last three-quarters of the required mixing, whichever occurs first.
4. Admixtures shall be used in accordance with the manufacturer's instructions.

D. Concrete shall be mixed only in quantities for immediate use. Concrete which has set shall not be retempered, but shall be discarded.

E. When concrete arrives at the project with slump below that suitable for placing, as indicated by the specifications, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. The water shall be incorporated by additional mixing equal to at least half of the total mixing required. An addition of water shall be accompanied by a quantity of cement sufficient to maintain the proper water-cement ratio. Such addition shall be reviewed by the Architect.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

1. Where earth is used for forming sides of footings, increase the width of footings by 1 inch on each side of the footing.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.
2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

B. Conduits and Pipes Embedded in Concrete:

1. Pipes, other than conduits for electrical circuits, shall not be embedded in structural concrete unless specifically reviewed and approved by the Architect. Any pipe or conduit may pass through any walls or floor slab by means of a sleeve so located that it does not impair the strength of the structure. Openings larger than 12 inches in any dimension shall be as detailed on the structural plans.
2. Unless otherwise approved, embedded pipes or conduits, other than those merely passing through, shall be not larger in outside dimension than one-third the thickness of the slab, wall, or beam in which they are embedded, nor shall they be spaced closer than three diameters or widths on center and shall have at least 1-1/2 inches concrete cover.

3. Sleeves, pipes, or conduits of aluminum shall not be embedded in structural concrete unless effectively coated or covered to prevent aluminum-concrete reaction or electrolytic action between aluminum and steel.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete must be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Coordinate installation of steel reinforcement with installation of vapor barrier specified in Division 07 Section “Below Grade Vapor Retarder.”
2. Do not cut or puncture vapor retarder; if cut or damaged, vapor barrier shall be repaired in accordance with Division 07 Section “Below Grade Vapor Retarder.”

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 CONVEYING

A. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.

B. Conveying equipment shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or work day. Conveying equipment and operations shall conform to the following additional requirements:

1. Truck mixers, agitators and non-agitating units and their manner of operation shall conform to the applicable requirements of ASTM C94.
2. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. A suitable device shall be used at the discharge end to prevent apparent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.

C. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

D. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete. The loss of slump in pumping or pneumatic conveying equipment shall not

exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy. When the concrete is placed into final position by means of pumping, the pumping method for placing concrete shall be reviewed and approved by the Architect at least one week prior to placing the concrete.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

1. Reposition any misaligned reinforcement.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
4. Do not use reinforcement or reinforcement supports to support runways for concrete conveying equipment.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 305 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not permanently exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces permanently exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Slab Finishes: Provide finished slab surfaces as indicated below; confirm and coordinate surface finishes for adhered and fluid applied floor finishes with trades installing/applying respective floor systems required for the project conditions.

Finish Floor Application	Slab Finish Type
1. Surfaces to receive mortar setting beds for tile	Scratch Finish

flooring and similar applications.

2.	Surfaces to receive thinset tile flooring directly over concrete	Trowel and Fine Broom Finish
3.	Surfaces to receive adhered carpet, resilient sheet, or resilient tile flooring	Trowel and Fine Broom Finish
4.	Surfaces to receive epoxy or polyurethane fluid applied flooring	Light Broom Finish (Confirm with floor system manufacturer)
5.	Surfaces to be exposed and sealed concrete	Troweled Finish
6.	Ramped exposed concrete	Medium Broom Finish
7.	Surfaces to receive waterproof membranes	Floated Finish

C. Slab Flatness (F_F) and Levelness (F_L): Provide finished slab flatness and levelness as indicated below; confirm and coordinate surface finishes for floor finishes with trades installing/applying respective floor systems required for the project conditions.

	Application		Flatness (F_F)	Levelness (F_L)
1.	Multi-Use Room (Assembly Space)	Overall: Local:	40 28	30 22
3.	Slabs to receive polished concrete finish	Overall: Local:	40 28	30 22
4.	Slabs to receive resilient flooring	Overall: Local:	30 24	25 15
5.	Slabs to receive carpet flooring	Overall: Local:	25 17	20 15
6.	Other areas not specified	Overall: Local:	25 17	20 15

D. Slab Finish Types:

1. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
2. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing.
3. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Trowel and Fine-Broom Finish: After applying a trowel finish and while concrete is still plastic, slightly scarify surface with a fine broom to produce a fine directional finish.

5. Broom Finish: Immediately after float finishing, slightly roughen surface by brooming with fiber-bristle broom perpendicular to main traffic route and/or ramp surfaces. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days using a water saturated absorptive cover kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

   a. This method shall not be used on floor slabs receiving adhered floor systems, fluid applied floor systems, or sealers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
b. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 LIQUID FLOOR TREATMENTS

A. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling as long as possible and until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

    a. Limit cut depth to 3/4 inch.
    b. Make edges of cuts perpendicular to concrete surface.
    c. Perimeters of cut areas shall be square or rectangular in shape with cuts vertical and horizontal.
    d. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried.
    e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting Agency: Owner will engage and pay for a qualified independent testing and inspecting agency to perform tests and inspections as applicable and prepare reports.

1. Testing and Inspection Agency shall be acceptable to the Architect.

B. The Architect shall have the right to order the testing of any materials used in the concrete construction to determine if they are of the quality specified.

C. Contractor Responsibilities:

1. The Contractor shall maintain control of the quality of materials and workmanship in order to conform with the drawings and specifications.
2. To facilitate testing and inspection, the Contractor shall:

   a. Schedule tests and inspections with the Testing and Inspection Agency sufficiently in advance of operations to allow for the assignment of personnel and for the completion of testing and inspecting responsibilities.
   b. Provide access to the Work for the designated Testing and Inspection Agency.
   c. Furnish all necessary materials and labor to assist the designated Testing and Inspection Agency in obtaining and handling samples at the project or other sources of materials.
   d. Provide and maintain for the sole use of the Testing and Inspection Agency adequate facilities for safe storage and proper curing of concrete test specimens on the project site for the first 24 hr. as required by ASTM C31.

3. The Contractor shall correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

D. Testing and Inspection Services:

1. Testing and inspections shall be performed by the designated Testing and Inspection Agency.
2. Testing and inspections shall be in accordance with the 2013 California Building Code, Section 1705.3 and Table 1705.3, and shall include but not be limited to the following:

   a. Inspection of steel reinforcement.
   b. Verification of use of required design mixture.
   c. Sampling of concrete for strength tests, slump, air content, and temperature of concrete at time of placement.
   d. Inspection of concrete placement, including conveying and depositing.
   e. Inspection of curing procedures and maintenance of curing temperature.

E. Sampling and Testing of Steel Reinforcement:

1. Samples of reinforcing steel shall be taken by a designated approved testing agency at place of distribution prior to shipment or at project site.
2. Where samples are taken from bundles as delivered from the mill, with the bundles identified as to heat number and provided the mill analyses accompany the report, one

tensile test and one bend test shall be made from a specimen from each 10 tons or fraction thereof of each size of reinforcing steel.

a. Where positive identification of the heat number cannot be made or where random samples are to be taken, one series of tests shall be made from each 2-1/2 tons or fraction thereof of each size of reinforcing steel.

3. Each sample shall consist of no fewer than two pieces, each 18 inches long, of each size and grade or reinforcing steel.

F. Placement Record: A record shall be kept on-site of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure and shall be open to the inspection of the governing agency.

G. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture but not less than one sample for each 50 cu. yd. or fraction thereof and one sample for each 2,000 square feet of slab area.

a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M.

a. Cast and laboratory cure four standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at 7 days for information and two cured specimens at 28 days for strength acceptance, the fourth specimen shall be held in reserve in case additional testing in necessary.

a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive

strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7 and 28-day tests.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
11. Additional testing and inspecting will be performed to determine compliance of replaced or additional work with specified requirements.

    a. The cost of additional testing and inspection of replaced work will be paid for by the Owner with the amount being deducted from the Contract Amount by a Change Order.

3.16 PROTECTION OF SEALED FLOORS

A. Protect sealed floor surfaces from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by floor treatment installer.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel framing and supports for mechanical and electrical equipment.
2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
3. Metal bollards.

B. Related Sections:

1. Division 03 Section “Post Installed Concrete Anchors” for post installed anchors in concrete and/or masonry.
2. Division 03 Section "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, wedge-type inserts and other items indicated to be cast into concrete.

1.3 SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.

C. Welding certificates.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."

2. AWS D1.3, "Structural Welding Code--Sheet Steel."
3. AWS D1.6, "Structural Welding Code--Stainless Steel."

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

1.6 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 METAL PRODUCTS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A 500, cold-formed steel tubing.

D. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

1. Provide galvanized finish for exterior installations where indicated.

E. Cast Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.

F. Iron Castings: Either gray or malleable iron, unless otherwise indicated.

G. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 coating, structural steel, Grade 33, unless another grade is required by design loads.

2.2 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1.

D. Anchor Bolts and Unheaded Rods: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

2.3 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 09 painting Sections**.**

C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply 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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated on Drawings.

J. Weld connections to comply 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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts if units are installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

2.6 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with not less than two integrally welded steel strap anchors for embedding in concrete.

2.7 METAL BOLLARDS

A. Fixed Bollards: Fabricate fixed metal bollards from Schedule 40 galvanized steel pipe.

1. Size: As indicated on Drawings, not less than 4 inches nominal diameter.

B. Removable Bollards: Fabricate removable metal bollards from Schedule 80 steel pipe.

1. Size: As indicated on Drawings, not less than 4 inches nominal diameter.
2. Cap bollards with 1/4-inch thick steel plate.
3. Lift Handles: Provide removable bollards with two 1/2 inch diameter lift handles, 6 inches long and projecting 2 inches from bollard, located on opposite sides of the bollard.
4. Sleeves: Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch thick steel plate welded to bottom of sleeve. Sleeve inside diameter shall be 3/4 inch larger than bollard outside diameter. Depth of sleeve shall be not less than 24 inches deep or as indicated on the drawings.
5. Galvanize bollard and sleeve after fabrication.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123/A 123M, for galvanizing steel and iron products.
2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications.

C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

3.3 INSTALLING METAL BOLLARDS

A. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

B. Fill bollards solidly with concrete, mounding top surface to shed water.

C. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with nonshrink, nonmetallic grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward bollard.

1. Do not grout removable bollards with concrete.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.

1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified.

1.04 INFORMATIONAL SUBMITTALS

A. Warranties.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.07 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 180 deg F (100 deg C), material surfaces.

2.02 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide galvanized steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation, Grade 40; pre-painted by coil-coating process to comply with ASTM A 755/A 755M.

1. Surface: Manufacturer's standard clear acrylic coating on both sides.
2. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 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.

3. Color: As selected by Architect from manufacturer's full range.

2.03 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; non-perforated.

2.04 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Solder:
1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.05 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

C. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength**.**

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
   4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
   5. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
   1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
   2. Use lapped expansion joints only where indicated on Drawings.

D. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

E. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
   1. Do not solder metallic-coated steel sheet.

2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.02 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturers written installation instructions.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.

1.02 PERFORMANCE REQUIREMENTS

A. Joint Sealants: All sealants shall comply with SCAQMD Rule 1168 VOC limits and shall comply with Rule 1168 prohibition on the use of therein defined toxic compounds.

1.03 PRECONSTRUCTION TESTING

A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.04 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.05 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Field-adhesion test reports.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

B. Preinstallation Conference: Conduct conference at Project site.

1.07 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply

with performance and other requirements specified in this Section within specified warranty period.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Furnish products of one of the following manufacturers subject to compliance with specifications requirements:
   1. Pecora www.pecora.com
   2. Tremco Vulkem Paraseal www.tremcosealants.com
   3. Dow Corning Corp. www.dowcorning.com
   4. General Electric www.ge.com
   5. Sika Corp. www.sika.com
   6. Sonneborn / Chemrex www.chemrex.com

2.02 MATERIALS, GENERAL

A. General: Sealants, primers, back-up materials, preformed joint fillers, bond breakers and related materials shall be compatible with adjoining materials.

B. Sealant:
   1. General: The selection of proper sealant for a particular joint shall be in accordance with current published recommendations of the manufacturer.
   2. Types: See Schedule in Part 3 for the location where each type of sealant is to be provided.
      a. Type "A": 2-part or 3-part (self-leveling) urethane, conforming to ASTM C920, Type M, Grade P, Class 25, Use T;
         1) Pecora NR-200 Urexpan Sealant or Dynatred
         2) Tremco THC-900/901
         3) Vulkem 45/245
         4) Sikaflex 2c SL (self-leveling)
         5) Sonneborn SL-2.
      b. Type "B": 3-part chemically curing polyurethane sealant conforming to ASTM C920, Type M, Grade NS, Class 25, Use NT, M, A, O, and capable of withstanding movement of 50 percent in extension and compression, and sustained temperatures of 250 degrees F in service.
         1) Tremco Dymeric 240 FC Sealant
         2) Pecora Dynatrol II
         3) Vulkem 922
         4) Sikaflex 2c NS (non-sag)
         5) Sonneborn NP-2.
      c. Type "D": ASTM C920, Type S, Grade NS, Class 25, Use NT, M,A,O.
         1) Sika Sikaflex 1A
         2) Pecora Dynatrol 1
         3) Tremco DyMonic FC
         4) Pecora 345
         5) Sonneborn NP-1.

   3. Color: Provide standard or custom colors as selected by Architect. In general, colors shall match adjacent materials.

C. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

D. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant

manufacturer; compatible with joint forming materials.

E. Joint Filler (Backer):
1. Buildings: ASTM C1330, Type B; round bi-cellular or closed cell polyethylene or polyolefin, or open cell polyurethane foam rod as recommended by the sealant manufacturer for the application; oversized 30 to 50 percent; "SofRod" as manufactured by Nomaco, or as approved.
2. Pavement: ASTM D5249, Type 3, round bi-cellular or closed cell polyethylene, urethane or neoprene foam rod; oversized 30 to 50 percent; "SofRod" as manufactured by Nomaco.

F. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

2.03 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.04 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
1. Remove laitance and form-release agents from concrete.
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

D. Existing Exterior Joints: Remove existing sealant, clean joint as indicated above, and apply new sealant.

3.02 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.03 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.04 JOINT-SEALANT SCHEDULE

Install sealants at locations scheduled below and also where noted on drawings.

A. Expansion and Control Joints at:
   1. Masonry, concrete to concrete, stucco, steel and wood: Type "B".

B. Non-expanding Joints at:
   1. Concrete to concrete, stucco, masonry, aluminum, steel, and wood: Type "D".

END OF SECTION

SECTION 09 91 13

EXTERIOR PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes surface preparation and the application of paint systems on exterior substrates.
   1. Concrete.
   2. Steel.
   3. Galvanized metal.

1.02 DEFINITIONS

A. Gloss Level 1 (Matte, Flat): Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2 (Velvet, Flat): Not more than 10 units at 60 degrees and 35 units at 85 degrees, according to ASTM D 523

C. Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7 (High Gloss): More than 85 units at 60 degrees, according to ASTM D 523.

H. EG: Ethylene Glycol. Ethylene glycol is listed as a hazardous air pollutant (HAP) by the U.S. EPA

I. Blocking: Two painted surfaces sticking together such as a painted door sticking to a painted jamb.

J. RAVOC: Reactivity adjusted VOC 'Reactivity' means the ability of a VOC to promote ozone formation.

K. PDCA: Painting & Decorating Contractors of America www.pdca.org.

L. SSPC: Scopes of SSPC Surface Preparation Standards and Specifications. www.sspc.org.

M. Bio-Pruf: Biostabilizing additive, to protect products from premature microbial degradation.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
   1. Submit Samples on rigid backing, no smaller than 7 inches by 10 inches or larger than 8.5 inches by 11 inches.
   2. Label each Sample for project, architect, general contractor, painting contractor, paint color name and number, paint brand name, "P" number if applicable, and application area.

C. Product List: For each product indicated, include the following:
   1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
   2. Following the format prescribed in Part 2. PRODUCTS, submit physical properties data and appropriate test results for each proposed product substitution.
   3. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
   4. VOC content.

1.04 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5 percent, but not less than 1 gallon of each material and color applied.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C) or more than 120 deg F (49 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.06 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 105 deg F (10 and 41 deg C).

B. Do not apply paints in rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. Painting contractor should follow proper painting practices and exercise judgment based on his or her experience and project specific conditions as to when to proceed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products from products by one of the following:
   1. Dunn Edwards Corp.

2. Sherwin-Williams
3. Frazee/Comex

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

C. MPI numbers may not be included for each product. In this case, a comparable product has been included.

2.02 PAINT, GENERAL

A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

C. Colorants: The use of colorants containing hazardous chemicals, such as ethylene glycol, is prohibited.

D. Colors: As scheduled.

2.03 PRIMERS/SEALERS

A. Primer, Alkali Resistant, Water Based: MPI #3
1. Dunn-Edwards: Eff-Stop Select ESSL00.
2. Sherwin-Williams: Loxon Concrete and Masonry Primer, A24W8300

B. Primer, Alkali Resistant, Water Based: MPI #3
1. Dunn-Edwards: Eff-Stop Premium ESPR00.
2. Sherwin-Williams: Loxon Concrete and Masonry Primer, A24W8300

C. Primer, Bonding, Water Based: MPI #17
1. Dunn-Edwards: Ultra-Grip Premium UGPR00.
2. Sherwin-Williams: Adhesion Primer, B51W8050.

D. Primer, Bonding, Solvent Based:
1. Distributed by Dunn-Edwards: Zinsser Cover Stain, MPI #69.
2. Sherwin-Williams: N/A.
3. Description: All-purpose oil-based exterior primer-sealer.

2.04 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #107.
1. Dunn-Edwards: Bloc-Rust BRPR00-1 Series.
2. Sherwin-Williams: Pro Industrial ProCryl Universal Primer, B66W00310.

B. Primer, Epoxy-Ester, Anti-Corrosive for Metal: MPI #95
1. Dunn-Edwards: Galv-Alum Premium GAPR00.
2. Sherwin-Williams: Kem Kromik Universal Primer, B50WZ1.

C. Primer, Galvanized, Water Based: MPI #134.
   1. Dunn-Edwards: Ultra-Grip Premium UGPR00.
   2. Sherwin-Williams: DTM Acrylic Primer/Finish, B66W1

2.05 EPOXY PRIMERS

A. Description: For priming concrete or steel surfaces to receive high performance polyurethane topcoats.

2.06 WATER-BASED PAINTS

A. 100% Acrylic, Latex, Exterior Flat (Gloss Level 1): MPI #10.
   1. Dunn-Edwards: Acri-Hues W720.
   2. Sherwin-Williams: DuraCraft Exterior Acrylic Latex Flat, C01W00251

B. 100% Acrylic Enamel, Latex, Exterior Velvet (Gloss Level 2): MPI #214.
   1. Dunn-Edwards: Spartashield SSHL20.
   2. Sherwin-Williams: SOLO 100% Acrylic EgShel Interior/Exterior, B75W00051

C. 100% Acrylic Enamel, Latex, Exterior Eggshell (Gloss Level 3):
   1. Dunn-Edwards: Spartashield SSHL30.
   2. Sherwin-Williams: DuraCraft Acrylic Latex Satin, C07W00251.

D. 100% Acrylic Enamel, Latex, Exterior Low Sheen (Gloss Level 4): MPI #15.
   1. Dunn-Edwards: Spartashield SSHL40**.**
   2. Sherwin-Williams: DuraCraft Acrylic Latex Satin, C07W00251

E. 100% Acrylic Enamel, Latex, Exterior Semi-Gloss (Gloss Level 5): MPI #11.
   1. Dunn-Edwards: Spartashield SSHL50.
   2. Sherwin-Williams: DuraCraft Acrylic Laytex Gloss, C14W00251.

F. 100% Acrylic Enamel, Latex, Exterior, Gloss (Gloss Level 6): MPI #119.
   1. Dunn-Edwards: Gloss Spartashield SSHL60.
   2. Sherwin-Williams: DuraCraft Acrylic Latex Gloss, C14W00251

G. 100% Acrylic, Latex, Exterior Flat (Gloss Level 1):
   1. Dunn-Edwards: Spartashield SSHL10. MPI #10, MPI #16.
   2. Sherwin-Williams: DuraCraft Acrylic Latex Flat, C01W00251. MPI #10.

H. Premium Architectural Coating, Exterior, Water Based, eggshell (Gloss Level 3): MPI #161.
   1. Dunn-Edwards: Spartashield SSHL30.
   2. Sherwin-Williams: DuraCraft Acrylic Latex Satin, C07W00251

I. Premium Architectural Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5):
   1. Dunn-Edwards: Spartashield SSHL50. MPI #163, MPI#11, MPI#54.
   2. Sherwin-Williams: DuraCraft Acrylic Latex Gloss, C14W00251.

J. Premium Architectural Coating, Exterior, Water Based, Gloss (Gloss Level 6):
   1. Dunn-Edwards: Evershield EVSH60. MPI #164, MPI #154, MPI #119, MPI #114**.**
   2. Sherwin-Williams: SOLO Interior/Exterior Gloss, A77W00051.

2.07 SOLVENT-BASED PAINTS

A. Alkyd, Quick Dry, Semi-Gloss (Gloss Level 5): MP #81.
   1. Dunn-Edwards: Syn-Lustro Series 9V.
   2. Sherwin-Williams: Industrial Enamel, B54 Series.

B. Alkyd, Quick Dry, Gloss (Gloss Level 7): MPI #96.
   1. Dunn-Edwards: Syn-Lustro 10V.
   2. Sherwin-Williams: Steel Spec Fast Dry Alkyd, B55W00811.

C. Two Component Polyurethane Semi Gloss:
   1. Distributed by Dunn-Edwards: Carboline Carbothane 133 Series aliphatic polyester polyurethane, (Gloss Level 3-4).
   2. Sherwin-Williams: Hi Solids Polyurethane, B65W351/B60V30.

D. Two component Polyurethane Gloss:
   1. Distributed by Dunn-Edwards: Carboline Carbothane 134 Series aliphatic acrylic polyurethane (Gloss Level 6).
   2. Sherwin-Williams: Hi Solids Polyurethane, B65W311/B60V30.

2.08 TEXTURED AND HIGH-BUILD COATINGS

A. Primer for Textured Coating, Latex, Flat: MPI #3.
   1. Dunn-Edwards: Flex-Prime Select FPSL00.
   2. Sherwin-Williams: Loxon Concrete and Masonry Primer, A24W8300.

B. Intermediate Coat for Textured Coating, Latex, Flat:
   1. As recommended in writing by topcoat manufacturer.

C. Textured Coating, Latex, Flat: MPI #42.
   1. Dunn-Edwards: Flex-Tex W322/W323.
   2. Sherwin-Williams: UltraCrete Medium Masonry Texture Topcoat, A44W00811

D. Primer for Latex, Exterior, High Build:
   1. As recommended in writing by topcoat manufacturer.

E. Intermediate Coat for Latex, Exterior, High Build:
   1. As recommended in writing by topcoat manufacturer.

F. Latex, Exterior, High Build: MPI #40.

2.09 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
   1. Owner may engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
   2. Testing agency will perform tests for compliance with product requirements.
   3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will comply with requirements to use compatible products and systems as described in Paragraph 2.2.A. Contractor will be required to remove rejected materials from previously

painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Concrete: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:
   1. SSPC-SP 1. "Solvent Cleaning."
   2. SSPC-SP 2, "Hand Tool Cleaning."
   3. SSPC-SP 3, "Power Tool Cleaning."
   4. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   5. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
   6. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.03 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
   1. Use applicators and techniques suited for paint and substrate indicated.
   2. The number of coats scheduled is the minimum number of coats required. Additional coat(s) shall be applied at no additional cost to the Owner, to completely hide base material, provide uniform color, and to produce satisfactory finish results.
   3. Apply coatings without thinning except as specifically required by label directions, or required by these specifications. In such cases, thinning shall be the minimum reduction permitted.
   4. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
   5. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
   6. Paint entire exposed surface of window frames and sashes.
   7. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   8. Priming may not be required on items delivered with prime or shop coats, unless otherwise specified. Touch up prime coats applied by others as required ensuring an even primed surface before applying finish coat.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
   1. Paint the following work where exposed to view:
      a. Uninsulated metal piping.
      b. Pipe hangers and supports.
      c. Metal conduit.

3.04 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.05 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.06 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:
1. Latex System:
a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat, 100% acrylic, (Gloss Level 1), MPI #10.
d. Topcoat: Latex, exterior velvet, 100% acrylic, (Gloss Level 2), MPI #214.
e. Topcoat: Latex exterior eggshell, 100% acrylic, (Gloss Level 3).
f. Topcoat: Latex, exterior, low sheen, 100% acrylic (Gloss Level 4), MPI #15.
g. Topcoat: Latex, exterior semi-gloss, 100% acrylic, (Gloss Level 5), MPI #11.
h. Topcoat: Latex, exterior gloss, 100% acrylic, (Gloss Level 6), MPI #119.
2. Water-Based Premium Architectural Coating System:
a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: 100% acrylic exterior flat coating, water based, (Gloss Level 1), MPI #10.
d. Topcoat: Premium architectural coating, exterior low sheen, water based, 100% acrylic, (Gloss Level 3), MPI #161.
e. Topcoat: Premium architectural coating, exterior, water based, semi-gloss, (Gloss Level 5), MPI #163.
f. Topcoat: Premium architectural coating, exterior, water based, gloss, (Gloss Level 6), MPI #164.

B. Steel Substrates:
1. Latex over Alkyd Primer System:
a. Prime Coat: Alkyd emulsion, anti-corrosive for metal, MPI #107.
b. Prime Coat: Shop primer specified in Division 05 Section where substrate is specified.
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior flat, 100% acrylic, (Gloss Level 1), MPI #10.
e. Topcoat: Latex, exterior velvet, 100% acrylic, (Gloss Level 2), MPI #214.
f. Topcoat: Latex, exterior eggshell, 100% acrylic, (Gloss Level 3).
g. Topcoat: Latex, exterior, low sheen, 100% acrylic, (Gloss Level 4), MPI #15.
h. Topcoat: Latex, exterior semi-gloss, 100% acrylic, (Gloss Level 5), MPI #11.
i. Topcoat: Latex, exterior gloss, 100% acrylic (Gloss Level 6), MPI #119.

2. Water-Based Premium Architectural Coating System:
   a. Prime Coat: Alkyd emulsion, anti-corrosive for metal, MPI #107.
   b. Prime Coat: Shop primer specified in Division 05 Section where substrate is specified.
   c. Intermediate Coat: Premium architectural coating, exterior, water based, matching topcoat.
   d. Topcoat: 100% acrylic exterior flat coating, water based, (Gloss Level 1), MPI #10.
   e. Topcoat: Premium architectural coating, exterior low sheen, water based, 100% acrylic, (Gloss Level 3), MPI #161.
   f. Topcoat: Premium architectural coating, exterior, water based, semi-gloss, (Gloss Level 5)**,** MPI #163.
   g. Topcoat: Premium architectural coating, exterior, water based, gloss, (Gloss Level 6)**,** MPI #164.
3. Quick-Drying Enamel System:
   a. Prime Coat: Alkyd, anti-corrosive for metal.
   b. Intermediate Coat: Alkyd, quick dry, matching topcoat.
   c. Topcoat: Alkyd, quick dry, semi-gloss, (Gloss Level 5)**,** MPI #81.
   d. Topcoat: Alkyd, quick dry, gloss, (Gloss Level 7)**,** MPI #96.

C. Galvanized-Metal Substrates:
1. Latex System:
   a. Prime Coat: Primer, 100% acrylic universal primer, galvanized, water based, MPI #134.
   b. Intermediate Coat: Latex, exterior, matching topcoat.
   c. Topcoat: Latex, exterior flat, 100% acrylic, (Gloss Level 1), MPI #10.
   d. Topcoat: Latex, exterior velvet, 100% acrylic, (Gloss Level 2), MPI #214.
   e. Topcoat: Latex, exterior eggshell, 100% acrylic, (Gloss Level 3).
   f. Topcoat: Latex, exterior, low sheen, 100% acrylic, (Gloss Level 4), MPI #15.
   g. Topcoat: Latex, exterior semi-gloss, 100% acrylic, (Gloss Level 5)**,** MPI #11.
   h. Topcoat: Latex, exterior gloss, 100% acrylic, (Gloss Level 6)**,** MPI #119.
2. Water-Based Premium Architectural Coating System:
   a. Prime Coat: Primer, 100% acrylic universal primer, galvanized, water based, MPI #134.
   b. Prime Coat: Alkyd, anti-corrosive for metal, MPI #79.
   c. Intermediate Coat: Premium architectural coating, exterior, water based, matching topcoat.
   d. Topcoat: 100% acrylic exterior flat coating, water based, (Gloss Level 1), MPI #10.
   e. Topcoat: Premium architectural coating, exterior low sheen, water based, 100% acrylic, (Gloss Level 3)**,** MPI #161.
   f. Topcoat: Premium architectural coating, exterior, water based, semi-gloss, (Gloss Level 5)**,** MPI #163.
   g. Topcoat: Premium architectural coating, exterior, water based, gloss, (Gloss Level 6)**,** MPI #164.
3. Alkyd System:
   a. Prime Coat: Alkyd, anti-corrosive for metal, MPI #79.
   b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
   c. Topcoat: Alkyd, exterior, semi-gloss, (Gloss Level 5)**,** MPI #81.
   d. Topcoat: Alkyd, exterior, gloss, (Gloss Level 7)**,** MPI #96.

END OF SECTION

SECTION 10 44 13

FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes exterior fire-protection cabinets for portable fire extinguishers.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fire-protection cabinets.

1.03 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.04 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall locations.

1.05 SEQUENCING

A. Apply decals on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.01 FIRE-PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Guardian Fire Equipment, Inc.
b. JL Industries, Inc.; a division of the Activar Construction Products Group.
c. Larsens Manufacturing Company.
d. Nystrom, Inc.
e. Potter Roemer LLC.

B. Cabinet Construction: Nonrated.

C. Cabinet Material: Cold-rolled steel sheet. 12 gauge cold-rolled steel finished with rust inhibitive baked primer.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on exterior wall or steel pole with no trim.

E. Door Material: 12 gauge cold-rolled steel sheet.

F. Door Style: Flush opaque panel, frameless, with heavy gauge continuous piano hinges.

G. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

H. Accessories:
1. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER"
1) Location: Applied to cabinet door.
2) Application Process: Decals.
3) Lettering Color: Contrasting color to cabinet.
4) Orientation: Vertical.

I. Materials:
1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
a. Finish: Baked enamel or powder coat.
b. Color: As selected by Architect from full range of industry colors and color densities.

2.02 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Prepare surface for fire-protection cabinets as required by type and size of cabinet and trim style.

B. Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

C. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

D. Identification: Apply decals at locations indicated.

E. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

END OF SECTION

SECTION 10 44 16

FIRE EXTINGUISHERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.03 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.04 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.05 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.06 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.02 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Amerex Corporation.
      b. Ansul Incorporated.
      c. Badger Fire Protection.

d. Buckeye Fire Equipment Company.
e. Guardian Fire Equipment, Inc.
f. JL Industries, Inc.; a division of the Activar Construction Products Group.
g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
h. Larsens Manufacturing Company.
i. Moon American.
j. Nystrom Building Products.
k. Potter Roemer LLC.

2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type: UL-rated 5-lb (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.

C. Portable Fire Extinguishers: All portable fire extinguishers shall be installed in accordance with NFPA Standard #10, "Portable Fire Extinguishers" the 2010 edition. All portable fire extinguishers shall be serviced and tagged by a reputable fire extinguisher service company prior to the unit being displayed for public use. Each fire extinguisher shall have a minimum classification rating of 2A10BC and contain at least four (4) pounds of dry chemical agent. At least one fire extinguisher shall be installed near the main entrance in a conspicuous location available to the public. Travel distance shall not exceed 75 feet from unit to unit. Provide proper units for this tenant space.

2.03 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.
1. Manufacturers: Subject to compliance with requirements, provide products by fire extinguisher manufacturer.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
a. Orientation: Horizontal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Examine fire extinguishers for proper charging and tagging.
1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.

C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION

SECTION 26 00 00

SUMMARY OF ELECTRICAL WORK

PART 1 - GENERAL

1.1 SCOPE

A. In general, the Electrical Work described herein consists of the installation of new electrical, lighting and signal systems equipment. All work shall be completed as directed by the Owner's authorized representative, in accordance with the Contract, Specifications and Construction Documents listed below.

1. General Conditions of Contract

2. Specifications:

Section	Title
26 0000	Summary of Electrical Work
26 0100	General Conditions for Electrical Work
26 0500	Basic Electrical Materials and Methods
26 0526	Grounding
26 2213	Dry Type Transformers (600V or Less)
26 2413	Switchboards
26 5113	Lighting
26 6100	Lighting Control Systems
26 9500	Electrical Acceptance Tests
27 2000	Telecommunications Systems
28 3100	Fire Alarm System
28 3300	Methane Detection and Alarm System

3. Electrical Construction Drawings as listed on the Drawing Index of the Construction Drawing set.

B. This Section includes all necessary and required work to complete the construction as indicated in the Drawings, called for by notes or schedules, or specified herein. This work includes the furnishing of all permits, labor, supervision, services, materials, tools, equipment, testing, transportation and miscellaneous expenses, and the performance of all operations necessary to or incidental to completion of lawful and operating electrical power, lighting and signal systems, whether or not specifically mentioned.

C. All work not shown in complete detail shall be installed per the CEC and in conformance with the best standard practice for the trade. Any deviation from the approved Drawings shall be submitted in writing to the Engineer and Owner for approval prior to the installation of the work in question.

D. This work shall include, but not necessarily be limited to, the following elements:

1. Demolition and Phasing:

   a. Make temporary feeds and connections to areas and equipment to allow phased construction and continuing operation.

2. Electrical Distribution:

   a. Power distribution system complete with conduits, feeders, pull boxes, fittings and related equipment and equipment pads.

   b. Trenching, conduits and feeders for electrical power.

3. Grounding

   a. Grounding system including installations of ground rods, ufer grounds, and ground rings, as shown. Connections to water and/or gas piping and structural steel.

   b. Provide above ground connections of underground cables to equipment and/or structural steel as shown on the Construction drawings and as required by Code.

   c. Testing of grounding system as outlined in Section 26 9500.

4. Signal Distribution:

   a. Trenching, conduits and conductors for signal systems.

   b. Building mounted conduits and conductors for signal systems.

   c. Trenching and conduits for control systems as required by Division 21-25 Specification Sections.

5. Electrical and Mechanical Systems:

   a. Complete system of branch circuit wiring, conduit and distribution equipment for power.

   b. Electrical work associated with mechanical equipment, including conduit, conductor, disconnect switches and motor starters.

   c. Connection to all equipment as furnished by other Sections of these Specifications or as listed on Drawings as furnished by Owner.

6. Each system shall be terminated, tested and calibrated by a factory-authorized installer. This same installer shall terminate and test any peripheral equipment required for the operation of the system.

7. Equipment Connections

   a. Provide equipment connections and coordination in accordance with manufacturer's recommendations and product submittals.

   b. Provide equipment connections and disconnect switches as required for the following equipment:

      1) Mechanical equipment.

      2) Owner furnished equipment.

E. Work specifically **excluded** from this Division.

1. Furnishing of motors.

F. It shall be understood that existing conduit with its wiring is presently active (hot), in operation with its pertinent equipment.

G. It shall be noted that this construction work will be planned and executed during ongoing operation of the facility. Any modifications to the existing equipment currently in operation shall be done during scheduled shutdowns and coordinated with the Owner's authorized representative and facility operating personnel to assure minimum downtime.

H. In order to avoid disruption to facility operations, certain items of work must be completed before other items of work can be started. Contractor shall coordinate with the Owner's authorized representative as to the sequence of construction activities.

I. Coordinate with the civil engineer to locate the concrete pad and the knock out box in the pad for the high voltage conduits and electrical power circuits.

J. Furnish, install and connect an underground grounding system, specifically mentioned on drawings as part of this contract, including all necessary materials and connections as required by code and/or as shown on the construction drawing.

K. Furnish, install and connect all above grade grounding materials and make aboveground connections of underground cables to equipment and/or structural steel as shown on the construction drawings and as required by code.

L. Size, furnish, install and connect new conduit, conduit fittings, and seal fittings, expansion fittings and supports. This includes above grade as well as underground.

M. Size, furnish, and install junction, pull and terminal boxes, in accordance to code requirements and as shown on the construction drawings.

N. Size, furnish and install all supports required for conduit installation, supports required for the installation of the equipment furnished by this Contractor and equipment furnished by others but installed by this Contractor.

O. Furnish and install permanent "DANGER - HIGH VOLTAGE" warning signs for the outdoor switchgear, motor control centers, power distribution panels, and on all doors of fenced yards, etc.

P. Furnish and install markers indicating voltage levels (e.g., 277/480V, 120/208V, etc.) for all of the electrical equipment such as motor control centers, power panels and switchboards.

Q. Furnish and install new nameplates per specifications on new motor control centers, motors and on all local control stations, power panels, disconnect switches, push button stations, instrument devices, etc.

R. Furnish and install wire tags in accordance with the specifications indicating wire number as shown on electrical schematics, one line, three line diagrams and specifications.

S. Furnish, install and connect all power, control and instrumentation cable, including all necessary cable lugs, connectors and terminations.

T. Perform all testing per the Specifications and report to Owner's field representative in a timely manner so as not to impede the scheduled completion of the Contract.

U. Furnish all material, labor and testing equipment necessary to check out and test the complete power distribution, control and pneumatic systems for all process and utility equipment in strict accordance with specifications. This shall include check out/start up of systems and/or equipment as directed by Owner.

V. Prime paint all uncoated carbon steel items furnished by Contractor.

W. Energize low voltage services after testing equipment and wiring in accordance with manufacturer instructions and specifications.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION 26 0000

SECTION 26 01 00

GENERAL CONDITIONS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. The general provisions of the Contract, including General Conditions and Specification Division 01, General Requirements, shall form a part of this Section, with the same force and effect as though repeated here. The provisions of this Section shall apply to all of the following Sections of Divisions 26-28 of these Specifications and shall be considered a part of these Sections.

1.2 QUALITY ASSURANCE

A. All work and materials shall fully comply with current rules and regulations of all applicable codes. Nothing in these Drawings or Specifications shall be interpreted as to permit any work not in compliance with these codes. Where work is detailed and/or specified to a more restrictive standard or higher requirement, that standard or requirement shall govern such work. Applicable codes include, but are not limited to, the following:

1. California Code of Regulations (CCR)
   a. Title 8, Industrial Relations
   b. Title 17, Public Health
   c. Title 24, Building Standards
2. 2013 California Building Code.
3. 2013 California Fire Code.
4. 2013 California Electrical Code.
5. Local Codes.

B. All electrical components, devices and accessories shall be listed with Underwriters Laboratories, Inc. (or other testing agency acceptable to authorities having jurisdiction), shall meet their requirements, shall bear their label wherever standards have been established and label service is regularly furnished by that agency, and shall be marked for intended use.

1.3 PERMITS, FEES AND TAXES

A. The Contractor shall secure all necessary permits and pay all required fees and taxes. He shall notify the proper authorities and have the work inspected and tested as required by jurisdictional requirements, pay all charges in connection therewith, and shall present to the Owner properly signed certificates of inspection. Acceptance of the work will not be considered until such certificates have been delivered.

B. The Owner shall pay all utility company charges related to the new services. This shall include any required street lighting charges.

1.4 TEMPORARY UTILITIES

A. The Contractor shall fulfill utility requirements for and pay all one-time and monthly charges for temporary construction utility usage.

B. There is no existing onsite power available to the Contractor for construction. The Contractor shall schedule his work such that the Medium and Low Voltage Electrical work is completed prior to needing onsite electrical power for jobsite trailers and/or construction equipment. The Contractor shall then use the Medium and Low Voltage power distribution system to provide construction power. The Contractor shall supply any supplemental temporary facilities required to provide construction power to the site (i.e. transformers, panels, outlet boxes).

1.5 EXISTING CONDITIONS

A. The Contractor shall carefully examine the site and existing buildings, compare them with Drawings and Specifications, and shall have satisfied himself as to the conditions to be encountered during the performance of the work. No subsequent allowance shall be made on his behalf for any additional expense he may incur due to failure or neglect of Contractor to examine site and to include existing conditions in bid.

B. Any work done as an addition, expansion, or remodel of an existing system shall be compatible with that system.

C. The Contractor shall examine all record drawings made available by the Owner to locate existing underground systems, utilities, conduits, and pipes prior to installing the electrical distribution system. The Contractor shall also examine the site for possible locations of sprinkler pipes. Any damage done to the existing systems during the course of the electrical work, whose locations could be reasonably determined, shall be repaired to the satisfaction of the Owner and the utility or agency involved, at the expense of the Contractor.

1.6 CONDUCT OF THE WORK

A. The Contractor shall maintain on the job a competent foreman or a superintendent at all times to superintend the Work.

1.7 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

A. The Engineer's decision will be final on interpretation of the Drawings and Specifications. Whenever the words "AS MAY BE DIRECTED", "SUITABLE", or "APPROVED EQUAL", or other words of similar intent and meaning are used, implying that judgment is to be exercised, it is understood that it is in reference to the judgement of the Engineer.

1.8 SUBMITTALS

A. Shop Drawings and Product Data

1. **Shop Drawings and Product Data** shall comply with the following requirements:

a. The Contractor shall submit for review, complete sets of Shop Drawings and Product Data brochures for materials and equipment as required by each section of the Specifications.

b. All Shop Drawings and Product Data shall be submitted at one time in a neat and orderly fashion in a suitable binder with a Title Sheet including Project, Engineer and Contractor, Table of Contents, and indexed tabs dividing each group of materials or item of equipment. The Specification paragraph number for which they are proposed shall identify all items. The mark number as indicated on Drawings shall also identify all equipment and fixtures.

c. Shop Drawings and Product Data submittal shall include manufacturer's name and catalog numbers, dimensions, loads, and all other characteristics and accessories as listed in the Specifications or on the Drawings. All loads, characteristics, and accessories called for in the Specifications or on the Drawings shall be highlighted, circled or underlined on the Shop Drawings and Product Data. Descriptive literature shall be current factory brochures and submittal sheets.

d. FAX submittals are not acceptable.

e. Material or equipment shall not be ordered or installed until the Engineer processes the written review. Any item omitted from the submittal shall be provided as specified without substitution.

f. Prior to submission of the Shop Drawings and Project Data, Contractor shall review and certify that they meet the requirements of the Contract Documents.

g. A minimum period of two weeks, exclusive of transmittal time, will be required each time Shop Drawings and/or Product Data are submitted or resubmitted for review. The Contractor shall consider this time when scheduling a submittal date.

B. Submittal Review

1. Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment and installation in accordance with the Drawings and Specifications.

2. The Contractor shall agree that Shop Drawings and Product Data submittals processed by the Engineer are not Change Orders and that the purpose of Shop Drawings and Product Data submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept. The Contractor demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.

3. It shall be clearly understood that the noting of some errors, but the overlooking of others, **does not** grant the Contractor permission to proceed in error or in conflict with Contract Documents. The Contractor shall agree that if deviations,

discrepancies or conflicts between Shop Drawings and Design Drawings and Specifications are discovered either prior to or after Shop Drawing submittals are processed by the Engineer, the Design Drawings and Specifications shall control and shall be followed.

4. If a resubmittal is required, submit a complete copy of the Engineer's review letter requiring such with the resubmittal.

C. Substitutions

1. **Substitutions** shall comply with the following requirements:

a. Manufacturers, model numbers and other pertinent information listed in the Specifications or on the Drawings are intended to establish minimum standards of performance, function and quality. Unless otherwise noted, the Contractor may submit equivalent compatible UL-listed equipment from other manufacturers for review, as long as the minimum standards are met.

b. Calculations and other detailed data indicating how the item was selected shall be included for items that are not specified. Data must be complete enough to permit detailed comparison of every significant feature, function, performance, and quality characteristic that is specified, scheduled or detailed. The comparison must prove that the substituted item equals or exceeds the requirements of the specified item.

c. The Contractor shall assume full responsibility that substituted items or procedures will meet the Specification and job requirements and shall be responsible for the cost of redesign and modifications to the work caused by these items.

d. At the Engineer's request, the Contractor shall furnish locations where equipment similar to the substituted equipment is installed and operating along with the user's phone numbers and contact person. Satisfactory operation and service history will be considered in the acceptance or rejection of the proposed substitution.

D. Record Drawings

1. **Record Drawings** shall comply with the following requirements:

a. At the beginning of the Project, one print of each applicable Drawing will be issued to the Contractor specifically for use in preparing Record Drawings. As the work progresses, the Contractor shall maintain a record of all deviations in the work from that indicated on the Drawings. Final locations of all underground work shall be recorded by depth from finished grade and by offset distance from permanent surface structures, e.g. building, curbs, walks. The original Drawings will be made available to the Contractor, from which he shall have made, a set of reproducible Drawings. The Contractor shall then transfer the changes, notations, etc. from the marked-up prints to the reproducible Drawings. The Record Drawings (marked-up prints and reproducibles) shall be submitted to the Engineer for review, after first securing the Inspector's verification by signature.

E. Operations and Maintenance Instructions

1. **Operations and Maintenance Instructions** shall comply with the following requirements:

a. Three copies of Operation and Maintenance Instructions and Wiring Diagrams for all equipment shall be submitted to the Engineer. All instructions shall be clearly identified by marking them with the same designation as the equipment item to which they apply (e.g. UPS-1). All Wiring Diagrams shall agree with reviewed Shop Drawings and indicate the exact field installation.

b. All instructions shall be submitted at the same time and shall be bound in a suitable binder with tabs dividing each type of equipment (e.g. MCC, UPS, etc.). Each binder shall be labeled indicating "Operating and Maintenance Instructions, Project Title, Contractor, Date" and shall have a Table of Contents listing all items included.

c. The Contractor shall verbally instruct the Owner's maintenance staff in the operation and maintenance of all equipment and systems. The Engineer's office shall be notified 48 hours prior to this meeting.

d. The Contractor shall prepare a letter indicating that all Operation and Maintenance Instructions (printed and verbal) have been given to the Owner, to the Owner's satisfaction. This letter shall be acknowledged (signed) by the Owner and submitted to the Engineer.

1.9 COORDINATION

A. Electrical Drawings are essentially diagrammatic, unless specifically dimensioned. Some work may be shown offset for clarity. The actual locations of all materials, conduits, fixtures, supports, etc. shall be carefully planned prior to installation of any work in order to avoid all interferences with each other, or with architectural, civil, mechanical, plumbing, structural or other elements.

B. While the size and location of equipment are shown to scale wherever possible, all dimensions and conduit/conductor data shall be verified in the field.

C. Where the work requires connections to be made to equipment furnished and set in place by others, the Contractor shall obtain exact rough-in dimensions from the manufacturer of such equipment and he shall install the connections in a neat and workmanlike manner.

D. If discrepancies are discovered between Drawings and Specifications requirements, the more stringent requirement shall apply.

E. All conflicts shall be called to the attention of the Architect and the Engineer prior to the installation of any work or the ordering of any equipment.

F. No work shall be prefabricated or installed prior to this coordination. No additional compensation will be considered to the Contractor for any prefabrication or installation performed prior to this coordination.

1.10 SCHEDULING

A. All work shall be scheduled subject to the review of the Architect, Engineer and the Owner. No work shall interfere with the operation of the existing facilities on or adjacent to the site. The Contractor shall have at all times, as conditions permit, a sufficient force of workmen and quantity of materials to install the work for which contracted, as rapidly as possible consistent with good work, and shall cause no delay to other Contractors engaged upon this project or to the Owner.

1.11 WARRANTY

A. Guarantee shall be in accordance with the General Conditions. These Specifications may extend the period of the guarantee for certain items. Where such extension are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the Certificate of Guarantee shall be furnished to the Owner through the Engineer.

B. Contractor shall deliver to the Owner a written guarantee on all workmanship, materials and equipment for a period of one (1) year from the date of acceptance by the Owner. Any work found to be faulty during that period of time shall be corrected at once, upon written notification, at the expense of the Contractor. This shall include repair or replacement of the premises that may be damaged as a result of faulty work and materials furnished.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be new unless otherwise noted.

B. Materials and equipment of a given type shall be by the same manufacturer.

C. Materials and equipment shall be covered or otherwise protected during construction as required to maintain the material and equipment in new factory condition until project acceptance. Upon completion of work and prior to final inspection, Contractor shall thoroughly clean all exposed fixtures, trim and equipment, and shall leave the entire installation in neat, clean, and useable condition. Materials and equipment shall be free of dents, scratches, marks, shipping tags, and all defacing features at time of project acceptance.

D. The Contractor shall order materials and equipment in a timely manner to prevent any delay in the construction schedule, and he shall bear any penalty by vendors to meet schedules.

E. Verify all dimensional information to ensure proper clearance for installation of equipment. Check all materials and equipment after arrival on the jobsite and verify compliance with the Contract Documents.

PART 3 - EXECUTION

3.1 DEMOLITION

A. The Contractor shall protect existing electrical equipment and installations that are not indicated to be removed. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Demolished material shall be removed from Project site.

3.2 CUTTING AND PATCHING

A. The Contractor shall perform all cutting and drilling, or other work, required to provide openings in walls, ceilings, floors, footings, foundations or other structures necessary to accomplish work under this Specification Division. The cutting shall be performed by skilled mechanics of the trades involved.

B. Cutting or coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Architect.

C. Wherever possible, work shall be done in a concealed and neat workmanlike manner requiring the least amount of cutting of studs, plates and woodwork. Such cutting or notching is allowed only after consultation with and by permission of the Engineer.

D. The Contractor shall repair and refinish disturbed finish materials and other surfaces to accurately match adjacent undisturbed new or existing structures and surfaces and shall install new fireproofing where existing fire-stopping has been disturbed. The repair and refinishing of materials and other surfaces shall be by skilled mechanics of the trades involved.

E. All cuts are to be clean with no chipping. Where chipping occurs as a result of work in a cut area, a new clean cut shall be made immediately prior to patching.

3.3 EXCAVATION AND BACKFILL

A. The Contractor shall provide excavation and backfilling required to complete work detailed in the Drawings and Specifications. Unless otherwise noted, minimum earth cover above top of conduit outside building walls shall be 24", not including base and paving in paved areas.

B. The location of all underground facilities shall be verified with the Owner and utility companies prior to the commencement of any excavation.

C. The Contractor shall contact Underground Service Alert (USA), at 1-800-642-2444, ten (10) days prior to doing any excavation or trenching, and shall advise USA of the work schedule and comply with their requirements.

D. The Contractor shall notify the Owner 72 hours prior to any excavation.

E. Provide all shoring required by site conditions. Where over-excavation occurs, provide compacted sand backfill. Where groundwater is encountered, remove to keep excavation dry, using well points and pumps as required.

F. The conduit shall be laid on firm soil cut true and even to afford bearing for the full length of the barrel of the conduit.

G. When the bottom uncovered at sub-grade is soft and, in the opinion of the Engineer, cannot support the conduit, a further depth shall be excavated and refilled to conduit foundation grade as required by the Engineer.

H. Backfill (where concrete encasement is not required):

1. Material 3” below, 3” around, and to 6” above conduit shall be sand. Place carefully around and on top of conduit, taking care not to disturb conduit. Consolidate with vibrator.

2. Material from 6” Above Conduit to Grade shall be sandy or silty loam, free of lumps, laid in 6” layers, uniformly mixed to proper moisture and compacted to required density. If backfill is determined to be suitable and required compaction is demonstrated by laboratory test, water compaction in 6” layers may be used, subject to review by Engineer.

I. No excavation below the level of, or adjacent to, foundations of footings shall be made except in a manner approved by the Structural Engineer.

J. Compaction

1. Prior to compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

2. Under **Structures, Building Slabs, Walkways, and Steps**, compact top 6” of sub-grade and each layer of backfill or fill material at 92% maximum relative compaction. Compact upper 2’ of backfill in utility trenches or other excavations to 92% minimum relative compaction.

3. In **Lawns and Unpaved Areas**, compact top 6” of sub-grade material to 85% relative compaction.

4. Under **Pavement**, compact top 8” of sub-grade immediately beneath the base course at 95% minimum relative compaction.

3.4 CONCRETE EQUIPMENT BASES

A. The Contractor shall provide a concrete equipment base for each piece of electrical equipment required to have a base as shown in the Drawings, Notes and Details.

B. Concrete equipment bases shall be 6” high concrete, 3500PSI strength, unless otherwise noted. Base shall extend 6” beyond the largest dimensions of the equipment, unless otherwise noted. The top edge of the base shall have a ¾” chamfer. The base shall have #4 reinforcing bars at 12” on center, each way, located at the mid-depth of the base.

C. If the base is not poured at the same time as the floor slab with base rebar tied to floor rebar, the base shall be anchored to the floor slab per the following criteria:

1. Drill 1” diameter, 4” deep hole in floor.

2. Fill hole with **Simpson SET Epoxy** then insert 8” long, #4 rebar into hole. Tie this rebar to that required for the equipment base.

3. Provide a minimum of 4 of these anchors per base but no more than 4 feet apart in either direction.

4. Anchor points shall be 12” from the edge of the base.

D. Concrete anchors shall be steel bolts with expansion anchors requiring a drilled hole. Powder-driven anchors are not acceptable. Minimum concrete embedment shall be 4.5 diameters but not less than manufacturer’s requirements for minimum strength. Minimum spacing shall be 10 diameters center-to-center and 5 diameters center to edge of concrete but not less than manufacturer’s requirements for minimum strength. Maximum allowable stresses for tension and shear shall be 80% of the ICC-ES test report values.

E. Where applicable, concrete structures shall be submitted to the serving utility for their approval prior to installation.

3.5 SEISMIC ANCHORAGE AND BRACING

A. Equipment Anchorage

1. All electrical equipment and components shall be anchored and installed per the details on the approved construction documents. Where no detail is indicated, the following components shall be anchored or braced to meet the force and displacements requirements prescribed in the 2013 CBC, Sections 1616A.1.18 through 1616A.1.26. and ASCE 7-10 Chapter 13, 26, and 30:

   a. All permanent equipment and components

   b. Temporary or movable equipment that is permanently attached (e.g. hard wired) to building utility electrical service.

   c. Movable equipment which is stationed in one place for more than 8 hours and heavier than 400 pounds are required to be anchored with temporary attachments.

2. The attachment of the following electrical components shall be positively attached to the structure, but need not be detailed on the plans. These components shall have flexible connections provided between the components and associated conduit.

   a. Components weighting less than 400 pounds and have a center of mass located 4 feet or less above the adjacent floor or roof level that directly support the components.

   b. Components weighting less than 20 pounds, or in the case of distributed systems, less than 5 pounds per foot, which are suspended from a roof or floor or hung from a wall.

   For those elements that do not require details on the approved drawings, the installation shall be subject to the approval of the Structural Engineer of Record.

The project inspector will verify that all components and equipment have been anchored in accordance with above requirements.

B. Electrical Distribution System Bracing

1. Electrical distribution systems shall be braced to comply with the forces and displacements prescribed in ASCE 7-10 Section 13.3 as defined in ASCE 7-10 Section 13.6.8, 13.6.7, 13.6.5.6, and 2013 CBC, Sections 1616A.1.23, 1616A.1.24, 1616A.1.25, and 1616A.1.26.

2. The bracing and attachments to the structure shall be detailed on the approved drawings or they shall comply with one of the OSHPD Pre-Approvals (OPA#) as modified to satisfy anchorage requirements of ACI 318, Appendix D.

3. Copies of the manual shall be available on the jobsite prior to the start of hanging and bracing of the electrical distribution systems.

4. The Structural Engineer of Record shall verify the adequacy of the structure to support the hanger and brace loads.

3.6 CLEANING AND PROTECTION

A. The Contractor shall, progressively and at completion of the job, thoroughly clean all of his work including outlets, fittings, and devices, and inspect exposed finishes. The Contractor shall remove all burrs, dirt, grease, paint spots, stains, labels, tags, rust, foreign material, and construction debris resulting from his work.

B. The Contractor shall protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 26 0100

SECTION 26 05 00

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SCOPE

A. See Section 260000

1.2 STANDARDS

A. NEMA 250 Standard for Enclosures for Electrical Equipment (1000 Volts Maximum)

PART 2 - PRODUCTS

2.1 CONCRETE PADS, PULL BOXES AND MANHOLES

A. At the Contractor's option, he shall provide cast-in-place or pre-cast structures.

B. Concrete Forms and Reinforcement Materials shall be as specified in Division 3 Section "Cast-in-Place Concrete".

C. Concrete shall be 2500-psi, 28-day compressive strength as specified in Division 3 Section "Cast-in-Place concrete".

D. Weatherproof concrete pull boxes, junction boxes and telephone boxes shall be manufactured by Christy Concrete Products or equal. All boxes shall have lids marked "Power", "Signal", "Fiber Optic", "Danger-High Voltage", etc. and be traffic-rated per CalTrans drawing ES-8 minimum where pull box occurs in vehicular traffic areas.

2.2 RACEWAYS AND FITTINGS

A. Galvanized rigid steel conduit (GRC) shall meet ANSI C80.1, and be heavy wall, hot dipped galvanized inside and out, with threaded ends, for use with threaded type fittings.

B. Rigid non-metallic conduit (RNC) shall meet NEMA TC 2, be Schedule 40 PVC, suitable for 90°C, with solvent cemented type NEMA TC3 fittings.

C. Liquid-tight flexible metallic conduit (LFMC) shall be same as FMC except with inert sunlight-resistant, mineral-oil-resistant watertight plastic outer jacket. Fittings shall be cast malleable iron body and gland nut, cadmium plated with one-piece brass grounding bushings threaded to interior of conduit. Spiral molded vinyl-sealing ring between gland nut and bushing and nylon-insulated throat.

D. All raceway fittings shall be specifically designed for the raceway type with which used.

2.3 CONDUCTORS

A. All conductors shall be delivered to the site in their original unbroken packages, plainly marked or tagged with UL labels, size, type of wire, type of insulation, name of the manufacturing company and trade name of the wire.

B. All conductors shall be minimum of 98% conductivity soft drawn copper. Conductors #8 AWG and larger shall be stranded type “THWN/THHN”, 600 Volt insulation. Conductors #10 AWG and smaller shall be solid copper “THWN/THHN”, 600 Volt insulation.

C. Insulation shall be Thermoplastic Type rated at 75 degrees C. minimum.

2.4 PULL BOXES AND WIREWAYS

A. Pullboxes and Enclosures for outdoor use shall be NEMA 250, Type 3R or Type 4, unless otherwise noted.

B. Pullboxes and Enclosures for indoor use shall be NEMA 250, Type 1, unless otherwise noted.

C. Wireways shall be constructed in accordance with UL 870 for wireways, auxiliary gutters and associated fittings. Every component including lengths, connectors and fittings shall be UL Listed.

D. Wireways and auxiliary gutters shall have continuous removable cover secured with screws and keyhole slots. Hinged cover shall be provided where installed above suspended ceiling.

E. Fabricated sheet steel pull boxes shall be installed only in dry, protected locations and shall be furnished with knockouts and removable screw cover. Box shall be finished with one coat of zinc chromate and a coat of primer sealer and where exposed to public view shall be painted to match the surrounding surface.

F. Weatherproof sheet steel pull boxes shall be fabricated of code gauge galvanized sheet steel with two coats of rust resistant finish and shall be furnished with gasket and made completely weathertight.

2.5 WIRING DEVICES AND MATERIALS

A. Outlet Boxes shall meet NEMA OS1 and be galvanized code gauge steel. Boxes in masonry shall be square cornered. Boxes exposed to weather or in wet locations shall be Type FD cast metal with external threaded hubs and gasketed cover and shall meet NEMA FB1.

B. Outlet box extensions shall be U.L. listed and shall be attached to box with threaded metal screws. “Flash Guards” are not permitted to be used as box extensions.

C. Approved manufacturers of metal boxes are Circle AW, Crouse-Hinds, Steel City or equal.

D. Receptacles:

1. GFCI Receptacles:

a. GFCI receptacles shall be duplex, feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch deep outlet box without an adapter.

b. Duplex GFCI receptacles shall be Hubbell or Leviton #GF5352 to match regular duplex receptacle.

2. Required Weather-Resistant Receptacles: All 15- and 20-ampere, 125- and 250-volt non-locking type receptacles located outdoors and in damp and wet locations shall be listed weather-resistant type.

3. Receptacles for Owner-furnished equipment shall match that equipment's plug configuration.

4. Other Receptacles: Other receptacles shall match the plug configuration and ratings required for the utilization equipment that is served.

E. Device cover plates shall be provided and installed at all wiring devices, switches, outlets, and similar applications, and shall be as directed by architect. Pull boxes and junction boxes to which no fixture is to be attached shall be fitted with blank cover plates painted to match surrounding. All cover plates installed on rated walls shall be brushed stainless steel.

2.6 TERMINAL CABINETS AND CLOSETS

A. Cabinets and fronts shall be in accordance with NEMA Standard Publication No. PB1-1971 and UL Standards No. 67. Fronts shall include doors and have flush, brushed stainless steel, cylinder tumbler-type locks with catches and spring loaded door pulls. The flush lock shall not protrude beyond the front of the door. All locks shall be keyed like the panel board locks. Fronts shall have adjustable indicating trim clamps that shall be completely concealed when the doors are closed. Doors shall be mounted by completely concealed steel hinges. Fronts shall not be removable with the door in the locked position. A frame and card with a clear plastic covering shall be provided on the inside of the door. Fronts shall be of code gauge full finished steel with rust inhibiting primer and baked enamel finish.

2.7 DISCONNECTING DEVICES

A. Disconnecting devices shall be provided as shown and/or as required by NEC.

B. Motor-rated switches shall be toggle-type, quick make-quick break, rated 2 HP, 250 VAC, with number of poles as required. They shall be equipped with overload heaters rated for overload protection of loads controlled.

C. Motor-rated switches shall be flush-mounted adjacent to load controlled. Where flush mounting is not possible, switches shall be surface mounted in NEMA enclosure suitable for environment in which installed.

D. Disconnect switches shall be 250V or 600V class, rated heavy-duty, horsepower rated, quick-make, quick-break, dead-front type and provided with proper number of poles.

E. Disconnect Switches shall be self contained in a NEMA 1 gasketed enclosure (NEMA 3R where installed outdoors) and externally operable from the front.

F. Fusible disconnect switches shall be equipped with rejection type clips suitable for UL Class R fuses up to 600A and suitable for UL Class L fuses above 600A. Fuse interrupting rating shall be 200,000 RMS symmetrical amperes.

G. Circuit breakers utilized as disconnecting devices shall comply with the requirements stated in other articles of this section and NEC.

2.8 FUSES

A. Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Bussman

2. Gould Shawmut

3. Littlefuse.

B. Fuses 600 amperes and below shall be UL Class RK1, 200,000 RMS symmetrical amperes interrupting rating.

2.9 INDIVIDUAL MOTOR CONTROLLERS:

A. Individual Motor Controllers shall be self contained in NEMA 1 gasketed enclosure (NEMA 3R where installed outdoors) and externally operable from the front.

B. Individual Motor Controllers shall be full-voltage non-reversing (FVNR) type combination magnetic starters for motors of ½ HP to 60 HP. Individual Motor Controllers shall be reduced voltage, non-reversing, autotransformer type combination magnetic starters for motors 75 HP and larger.

2.10 MAGNETIC STARTERS FOR MECHANICAL EQUIPMENT

A. All magnetic starters for mechanical equipment shall be furnished with integral 120VAC control transformers, sized to handle the starter and all controls connected to it – pilots, EP valves, etc.

B. All magnetic starters for mechanical equipment shall be provided with auxiliary contacts as required for interlock to EMS System. An allowance of at least one auxiliary contact per starter shall be estimated.

2.11 SUPPORTING DEVICES

A. Supporting devices shall be constructed of cold-formed steel, with a corrosion-resistant coating acceptable to authorities having jurisdiction.

B. Metal items for use outdoors or in damp locations shall be hot-dipped galvanized steel.

C. Slotted-steel channel supports shall have flanged edges turned toward the web, and 9/16-inch diameter slotted holes at a maximum of 2 inches on center, in the web.

1. Channel thickness shall be selected to suit structural loading.

2. Fittings and accessories shall be products of the same manufacturer as the channel supports.

D. Raceway and cable supports shall be manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

E. Pipe sleeves shall be ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, with plain ends.

F. Cable supports for vertical conduit shall be a factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs shall have number and size of conductor gripping holes as required to suit individual risers. Body shall be constructed of malleable-iron casting with hot-dip galvanized finish.

G. Concrete anchors shall be steel bolts with expansion anchors requiring a drilled hole. Powder driven anchors are not acceptable.

H. Toggle bolts shall be all-steel springhead type.

2.12 ELECTRICAL IDENTIFICATION

A. Identification devices shall be a single type of product for each application category. Colors shall be as prescribed by ANSI A13.1, NFPA 70, and these Specifications.

B. Raceway and cable labels shall comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.

1. Pre-tensioned, wraparound plastic sleeves shall be a flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the item it identifies.

2. Preprinted, flexible, self-adhesive, vinyl labels shall have a legend, over-laminated with a clear, weather- and chemical-resistant coating.

3. Color shall be black letters on orange background.

4. Legend shall indicate voltage.

C. Self-adhesive colored marking tape for raceways, wires and cables shall be vinyl tape, not less than 1 inch wide by 3 mils thick.

D. Underground Warning Tape shall be vinyl tape, compounded for permanent direct-burial service, not less than 6 inches wide by 4 mils thick, embedded with a continuous metallic strip or core, brightly-colored, continuously-printed with a legend that indicates the type of underground line.

E. Tape markers for wire shall be vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

F. Color-coding cable ties shall be made of Type 6/6 nylon, be self-locking type and of colors to suit coding scheme.

G. Engraved plastic labels, signs and instruction plates shall be made from black (or red as noted) Bakelite laminate engraving stock with a white core, punched or drilled for mechanical fasteners. It shall have a minimum thickness of 1/16-inch for signs up to 20 sq. in. and a minimum thickness of 1/8-inch for larger sizes.

H. Interior Warning and Caution signs shall comply with 29 CFR, Chapter XVII, Part 1910.145 and shall be preprinted, aluminum, baked-enamel-finish signs, punched or drilled for mechanical fasteners, with colors, legend, and size appropriate to the application.

I. Exterior Warning and Caution signs shall comply with 29 CFR, Chapter XVII, Part 1910.145 and shall be weather-resistant, non-fading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch, galvanized-steel backing, with colors, legend, and size appropriate to the application. They shall be equipped with 1/4-inch grommets in each corner for mounting.

J. Fasteners for nameplates and signs shall be self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

K. Arc-Flash Hazard Warning labels shall be provided at electrical equipment such as switchboards and panelboards in accordance with CEC 110.16.

L. Circuit Identification – A typewritten circuit directory shall be provided at each panelboard and switchboard in accordance with CEC Article 408.4(A). The Contractor shall develop and prepare the circuit identification description based on the as-built condition.

M. Source of Supply Identification – All switchboards, panelboards and transformers shall have a typewritten label applied indicating the device or equipment where the power supply originates per CEC Article 408.4(B).

2.13 TOUCHUP PAINT

A. Touch-up paint shall be equipment manufacturer's paint selected to match installed equipment finish.

PART 3 - EXECUTION

3.1 ELECTRICAL INSTALLATION

A. All material, equipment, devices, etc., shall be installed in accordance with the recommendations of the manufacturer of the particular item. The Contractor shall be responsible for all installations contrary to the manufacturer's recommendations. The Contractor shall make all necessary changes and revisions to achieve such compliance. Manufacturer's installation instructions shall be delivered to and maintained at the job site throughout the construction of the project.

B. The layout and installation of electrical work shall be coordinated with the overall construction schedule to prevent delay in completion of the project.

C. Dimensions and information regarding accurate locations of equipment and structural limitations and finish shall be verified with other sections.

D. The drawings do not show all raceway, wiring, offsets, bends, special fittings, junction or pull boxes necessary to meet job conditions. Items not shown as indicated, where are clearly necessary for proper operation or installation of systems shown, shall be provided as required, at no increase in contract price.

E. Materials and Components shall be installed level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

F. Electrical equipment, outlets, junctions and pull boxes shall be installed in accessible locations, avoiding obstructions, preserving maximum headroom, and keeping openings and passageways clear.

G. Equipment shall be installed to facilitate service, maintenance, and repair or replacement of components. It shall be connected for ease of disconnecting, with minimum interference with other installations. Minor adjustments in the locations of equipment shall be made where necessary providing such adjustments do not adversely affect function of the equipment. Major adjustments for the location of equipment shall be previously approved and detailed on the Record Drawings.

H. Right of Way shall be given to raceways and piping systems installed at a required slope.

3.2 PRECAST CONCRETE PULL BOXES AND MANHOLES

A. Contractor shall provide a minimum of 3-6" of sand base material suitable to receive the pullbox or manhole. The base material shall be compacted and graded level at proper elevation to receive the pullbox or manhole in relation to the conduit grade or ground cover requirements as designated in the plans.

B. Sealants used between the joints of the pullbox or manhole are at the Contractor's discretion unless otherwise specified. If grout is used, it should consist of two parts plaster sand to one part cement with sufficient water added to make the grout flow under its own weight. The grout should be poured into a water soaked groove and filled to the top of the groove unless a double amount is to be used as a further precaution against leakage. In this case, the mastic sealant should be placed on the two shoulders of the

groove. The next section of pullbox or manhole should be placed while the foaming action is in process. Contractor shall verify grades with the Engineer and shall set holes and boxes level at proper grades.

C. All conduits penetrating the pull box or manhole shall have seals to prevent water from entering the raceway.

3.3 RACEWAY APPLICATION

A. Galvanized Rigid Steel Conduit (GRC) **may** be used in all locations. Where installed in direct contact with earth, conduit shall be wrapped with two layers of half-lapped 10-mil PVC tape for a total thickness of 40-mil or have a factory applied 40-mil PVC coating.

B. Galvanized Rigid Steel Conduit (GRC) **shall** be used where exposed to physical damage, indoors where exposed to moisture, in exposed outdoor installations, in systems higher than 600 volts, and where required by code.

C. Rigid Non-Metallic Conduit (RNC) Schedule 40 PVC **may** be used underground or below concrete slabs on grade. Rigid Non-Metallic Conduit (RNC) **shall not** be installed above grade or above finished floor level.

D. Liquid-tight Flexible Metallic Conduit (LFMC) **may** be used in all locations to make final connections to motors, transformers, or other mechanical equipment (not to exceed 24 inches in length) or lighting fixtures (not to exceed 72 inches in length). Where specifically approved by the Engineer, LFMC may be used to facilitate wiring in tight locations or in other conditions that make the use of other conduit impracticable.

3.4 RACEWAY INSTALLATION

A. General

1. Expansion joints shall be provided at building expansion joints or as required due to length of run or difference in temperatures.

2. All fittings that are exposed or in damp areas shall have sealing glands and proper gasket.

3. In general, all conduits shall be sloping to drain. Bends that place a trap in a conduit shall be avoided. Provided drip fitting as required. Dux-Seal high ends of all underground raceways.

4. All conduit runs shall be mechanically and electrically continuous from outlet to outlet. Conduit size or type shall not be changed between outlets.

5. All empty raceways shall be equipped with pull lines, capped and labeled. Pull lines shall be 3/16” polypropylene, No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack with identification tag at each end of the pull wire.

6. Minimum size of any conduit for power and signal shall be ¾” conduit unless shown otherwise.

7. Use temporary raceway caps to prevent foreign matter from entering. Immediately prior to installation of conductors, conduit shall be blown and swept free of foreign materials. All conduit stubs for future, both above and below grade, shall be capped. Run conduits for spare panelboard circuits to attic or accessible spaces.

8. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

9. Make bends in exposed parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for exposed parallel raceways.

10. There shall be no more than the equivalent of four quarter bends (360-degrees total) between pull points such as pull boxes, outlet boxes or conduit bodies, in one run of conduit.

11. Install raceways and cables at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Locate horizontal raceway runs above water and steam piping.

12. Conduits shall be securely fastened to building structure at intervals not greater than ten feet.

13. Conduit shall be square cut and reamed if required to full size, with thread full cut and true.

14. Conduits shall be jointed by approved couplings with ends of conduits tightly butted. Non-insulating compound shall be used in making up joints below grade or inside on grade to insure a watertight system.

15. Conduit connections to outlet boxes or cabinets shall be made with approved connectors, using locknuts and insulated throat bushings.

16. Complete raceway installation before starting conductor installation.

17. Contractor shall provide rubber grommets to fasten galvanized conduit to exterior structures made of dissimilar metals at all exterior locations to prevent galvanic corrosion.

18. Contractor shall provide rubber grommets to fasten galvanized conduit to supports which are also used by other systems utilizing piping of dissimilar metals to prevent galvanic corrosion.

B. Exterior

1. Exterior conduit including the sweep below grade and the vertical riser shall be galvanized rigid steel conduit, except where rigid non-metallic conduit is required for utility service conduits by the serving utility company.

2. No rigid non-metallic conduit (RNC) shall be installed above grade.

C. Underground

1. Two or more power **or** telecommunications conduit runs installed in a common trench shall be separated horizontally by a minimum of four inches (4”).

2. Two or more power **and** telecommunications conduit runs installed in a common trench shall be separated horizontally by a minimum of twelve inches (12”).

3. **All** electrical conduit runs installed in a common trench with other utility company lines, plumbing pipes, or heating pipes shall be separated horizontally from such lines by a minimum of twelve inches (12”).

4. Conduits installed underground and not under buildings shall have a minimum of 24” of cover over the top of the conduit.

5. Rigid non-metallic conduit shall be laid on excavated firm bed, sealed watertight and unless with 24 inch earth cover, shall have 3 inch minimum concrete encasement unless under concrete. Plastic conduit without encasement shall be random lay, “snaked”, not pulled tight. Plastic conduit laid in areas of reinforcing steel shall be supported independently at each threaded fitting. Plastic conduit joints shall be full solvent welded.

6. Rigid non-metallic conduit installed underground and not below a building slab shall have a galvanized rigid steel long radius elbow installed at the terminating end where the transition from horizontal to vertical occurs.

D. In Concrete Slabs

1. Conduit installed within concrete slabs shall be Schedule 80 PVC rigid non-metallic conduit or full weight galvanized rigid steel conduit.

2. Conduits in concrete slabs 3 inches thick or less shall not be of size larger than ¾ inch nominal trade size, and wired to top of reinforcing steel.

3. Conduit installed in concrete slabs shall be installed in the middle third of the slab thickness where practical, and have at least 1-inch concrete cover.

4. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.

5. Conduit installed in concrete slabs shall be installed side-by-side horizontally and shall have no less than 1” spacing between each conduit to allow for concrete consolidation to prevent voids in the concrete. Conduits that are installed in concrete slabs shall be arranged such that they do not cross over other conduits within the concrete slab. Where crossing of conduits is unavoidable the crossing sets of conduits shall be installed below the slab. No more than 3 conduits shall be installed side-by-side in a concrete slab without special permission from the structural engineer.

6. Install conduit larger than 1-inch trade size parallel to or at right angles to main reinforcement. Where conduit is at right angles to reinforcement, place conduit close to slab support.

7. Contractor shall be responsible for damages to membrane and shall repair it.

E. Signal Systems

1. Install telecommunication and signal system raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent.

2. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

F. Flexible Conduit

1. LFMC shall be used to connect motors and equipment subject to vibration, noise transmission, or movement to junction boxes, with a maximum length of 24-inches.

2. Install separate ground conductor across flexible connections.

3. Flexible conduits shall be independently suspended.

G. Hazardous Locations

1. Conduit **within** Class 1 areas shall be threaded rigid metal conduit per N.E.C. 511 and/or 514.

2. Underground conduit **below** Class 1 areas shall be rigid non-metallic conduit per N.E.C. 511 and/or 514.

3. Approved seal-off type fittings shall be used in Class 1 locations per N.E.C.

4. Fittings in hazardous areas shall be of the type approved for the particular hazard.

3.5 CONDUCTOR APPLICATION

A. Feeders and branch circuits shall be Type THHN/THWN insulated conductors in raceway.

B. Minimum conductor size shall be #12 for power and lighting, #14 for 120V control circuits and #18 for 24V control circuits.

C. Remote control, signaling and power-limited circuits shall be Type THHN/THWN insulated conductors in raceway for Classes 1, 2, and 3, unless otherwise indicated.

3.6 CONDUCTOR INSTALLATION

A. Conductors shall be continuous from outlet to outlet, no splices shall be made except within outlet or junction boxes.

B. Wiring at outlets shall be installed with at least 12 inches of slack conductor at each outlet.

C. Outlet and component connections shall be made to wiring systems and to ground. Electrical connectors and terminals shall be tightened according to manufacturer's

published torque-tightening values. Torque values specified in UL 486A shall be used where manufacturer's torque values are not indicated.

D. Wire in panels, cabinets, pull boxes, and wiring gutters shall be squared, labeled, and neatly grouped with cable ties and fanned out to the terminals.

E. All branch circuits, fixture wiring joints, splices, and taps for conductors #10 and smaller shall be made with 3M "Scotchlock" connectors, or approved equal.

F. All branch circuits, fixture wiring joints, splices, and taps for conductors #8 and larger shall be made with two-bolt type solderless connectors or T & B "color keyed" compression lugs.

G. Bolt-type solderless connectors shall be torqued with a torque wrench according to the manufacturer's recommendations, and then retightened after 24-48 hours before taping. Owners' inspector shall be informed of this procedure during the waiting period and shall witness the act of retightening.

H. Connectors and lugs for terminating stranded conductors #8 and larger shall be machine crimp compression type.

I. All splices shall be taped with Scotch #88 plastic electrical tape with "Scotch Fill" where necessary for a smooth joint. Scotch #27 or #2520 shall be used for other than normal temperatures or conditions. All connections and splices shall be electrically perfect and in strict accordance with all code requirements.

J. No splices shall be made below grade in a manhole or pullholes without Engineer's written approval, and then shall be encapsulated with 3M potting kits per 3M Specifications. For larger gauge wire where 3M potting kits are prohibited Contractor shall use submersible UL listed Polaris connectors by NSi.

3.7 WIREWAY AND AUXILIARY GUTTER APPLICATION

A. Wireways and auxiliary gutters shall be used above and below panelboards, lighting relay cabinets, and terminal cabinets to accommodate large concentrations of wires.

3.8 PULL BOXES AND WIREWAYS:

A. Boxes shall be installed square and plumb. An engraved nameplate shall be installed on each box indicating its function. Nameplate shall be installed on the exterior of each box in unfinished areas and on the interior of each box in finished areas.

B. Wireways shall be installed with strip-type connectors with self-retained mounting screws. Hangers with two piece, hook together features shall be used to permit preassembly of wireway and hanger bottom plate before hanging on a preinstalled upper bracket.

C. Pull and junction boxes shall be installed as shown to ease the pulling of wire and to comply with CEC requirements.

3.9 WIRING DEVICES AND MATERIALS

A. Outlets shall be mounted at 18” minimum above finished floor unless otherwise noted.

B. The locations of outlets shown on drawings shall be located with respect to work of others and to be symmetrical with room layout.

C. Switches shall be mounted 48” to top of device box above finished floor unless otherwise noted.

D. Boxes shall be sized for number of conductors entering box.

E. All device screw slots shall be left in a vertical orientation.

F. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor and to outlet box with bonding jumper.

3.10 TERMINAL CABINETS AND CLOSETS

A. Terminal cabinets shall be installed level and identified with nameplate per schedule.

B. All conductors in terminal cabinets or closets shall be squared, labeled and secured neatly with wire ties.

C. All terminal cabinets shall be installed with the top of the trim at 6’-0” above the finished floor, unless otherwise indicated on the drawings.

D. Where space permits, terminal cabinets shall be surface mounted where they are not visible to the public.

E. A typewritten directory shall be mounted behind plastic in a metal holder welded to the inside of each terminal cabinet door showing a complete description of terminations in each cabinet.

3.11 DISCONNECT DEVICES

A. Thoroughly examine site conditions for acceptance of disconnects switch installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.

B. Coordinate locations of switches and equipment in the field to provide code required clearances in front of switches and to insure that switches are in sight of the controllers as described in NEC Article 430.

C. Install disconnect switches where indicated on the Drawings.

D. Install fuses in fusible disconnect switches.

E. Include construction channel and mounting hardware as required to support disconnect switch.

F. Provide engraved, machine screw retained nameplate on each disconnect switch. Name plate shall identify equipment and panelboard + branch circuit breaker.

3.12 SUPPORTING DEVICE APPLICATION

A. Hot-dip galvanized materials or nonmetallic channel and angle system components shall be used in damp locations and outdoors.

B. Steel materials shall be used in dry locations.

C. Support clamps for PVC raceways shall be click-type clamp system.

D. Strength of supports shall be adequate to carry present and future loads, times a safety factor of at least four with a minimum of 200-lb design load.

3.13 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch diameter or larger threaded steel hanger rods, unless otherwise indicated.

G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Simultaneously install vertical conductor supports with conductors.

J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.

K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

M. Securely fasten electrical items and their supports to the building structure, according to the following criteria, unless otherwise noted:

1. Wood – wood screws or screw-type nails.

2. Masonry – toggle bolts on hollow masonry units, expansion bolts on solid masonry units.

3. New Concrete – concrete inserts with machine screws and bolts.

4. Existing Concrete – expansion bolts.

5. Steel – welded threaded studs or spring-tension clamps on steel. Field welding shall comply with AWS D1.1. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.

6. Light Steel – sheet-metal screws.

7. Fasteners shall be selected so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.14 ELECTRICAL IDENTIFICATION

A. Each conductor of every system shall be permanently tagged in each panelboard, pull box, J-box, etc., in compliance with the Occupational Safety and Health Administration (OSHA).

B. Brady labels shall be used to identify terminals and destination of feeders, branch circuits, signal and control circuits, etc., at all terminations, junction boxes and pull boxes, and shall be coordinated with the nameplates in all boxes and equipment.

C. All terminals in the switchboards, panels, relays, switches, devices, starter terminals, etc., shall have Brady labels for identification to identify both ends of all wiring.

D. The Contractor shall furnish and install 1” x 3” x 3/32” thick laminated black Bakelite nameplates with a white core (unless specifically shown as red) engraved to produce white letters on black background for all items of electrical equipment, including 2-pole and 3-pole circuit breakers, panelboards, starters, relays, time switches and disconnect switches.

E. All devices shall have their branch circuit identified on the back side of device plate with a permanent type black marker, i.e. CT A-21. Identify panelboard and circuit number from which receptacles are served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on face of plate and durable wire markers or tags within outlet boxes.

F. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

G. Panels having single-pole circuit breakers shall be provided with typed schedules mounted in welded metal holders behind plastic.

H. Clean surfaces that are to receive self-adhesive identification products before applying.

I. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.

J. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches, overall, use a single line marker.

K. All power conductors shall be identified in accordance with the following schedule:

1. 120/208V, 3 Phase, 4 Wire System.
   a. Phase A: Black.
   b. Phase B: Red.
   c. Phase C: Blue.
   d. Neutral: White.
   e. Ground: Green.
2. 277/480V, 3 Phase, 4 Wire System.
   a. Phase A: Brown.
   b. Phase B: Orange.
   c. Phase C: Yellow.
   d. Neutral: White with a colored stripe or gray.
   e. Ground: Green.

L. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

M. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

END OF SECTION 26 0500

SECTION 26 05 26

GROUNDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections shall form a part of this Section, with the same force and effect as though repeated here.

1.2 SUMMARY

A. This Section includes grounding of electrical systems and equipment and basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.

1.3 SUBMITTALS

A. Submittals for this Section shall be made according to the Conditions of the Contract, Division 1 Specification Sections and Specification Section 26 0100.

B. Product Data for grounding rods, connectors and connection materials, and grounding fittings.

C. Qualification data for firms specified in "Quality Assurance" Article to demonstrate their capabilities and experience.

D. Field tests and observation reports certified by the testing organization and indicating and interpreting the test reports for compliance with performance requirements.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7, or a full member company of the InterNational Electrical Testing Association (NETA).

1. Testing Agency Field Supervision: Use persons currently certified by NETA or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

B. Comply with UL 467.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Chance: A. B. Chance Co.

2. Erico Inc.; Electrical Products Group.

3. Galvan Industries, Inc.

4. Lyncole XIT Grounding.

5. Raco, Inc.

6. Thomas & Betts, Electrical.

2.2 GROUNDING AND BONDING PRODUCTS

A. Where types, sizes, ratings, and quantities indicated are in excess of California Electrical Code (CEC) requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

2.3 WIRE AND CABLE GROUNDING CONDUCTORS

A. Conform to CEC Table 8, except as otherwise indicated, for conductor properties, including stranding.

1. Material: Copper.

B. Equipment Grounding Conductors: Insulated with green color insulation.

C. Grounding-Electrode Conductors: Stranded cable.

D. Bare Copper Conductors: Conform to the following:

1. Solid Conductors: ASTM B 3.

2. Assembly of Stranded Conductors: ASTM B 8.

3. Tinned Conductors: ASTM B 33.

2.4 MISCELLANEOUS CONDUCTORS

A. Grounding Bus: Bare, annealed-copper bars of rectangular cross section.

B. Braided Bonding Jumpers: Copper tape, braided No. 30 AWG bare copper wire, terminated with copper ferrules.

C. Bonding Straps: Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

2.5 CONNECTOR PRODUCTS

A. Grounding connections shall be exothermic welded, bolted clamp terminal, or pressure connector type.

B. Exothermic-Welded Connections shall be provided in kit form and selected per manufacturer's written instructions for specific types, sizes, and combinations of conductors and connected items.

C. Bolted Clamp connectors shall be heavy-duty type.

D. Pressure connectors shall be high-conductivity-plated units.

2.6 GROUNDING ELECTRODES AND TEST WELLS

A. Grounding Rods shall be sectional type; copper-clad steel.

1. Size: 3/4 inch by 120 inches.

B. Plate Electrodes shall be copper, square or rectangular shape. Minimum 0.10 inch thick, size as indicated.

C. Test Wells shall consist of a Christy Concrete Products F8 Box, or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. The conduit system, supports, cabinets, switchboards, etc., and neutral conductors must be permanently and effectively grounded by means of approved ground clamps, in accordance with Title 24 of the California Code of Regulations. The neutral shall only be grounded at the main service location unless specifically noted otherwise on the drawings or required by the California Electrical Code.

B. This Contractor shall exercise every precaution to obtain good contacts at all panel boxes, pull boxes, etc. Where it is not possible to obtain good contacts, the conduits shall be bonded around the boxes with a #6 AWG gauge, THWN wire with ground clamps.

C. Where there is more than one building supplied from a common service, provide a grounding electrode system at each building per CEC 250.50 and connect per CEC 250.32(B)(1).

3.2 APPLICATION

A. General

1. All equipment cases, motor frames, etc. shall be completely grounded to satisfy applicable code requirements.

2. The interior hot and cold water piping and the interior above ground gas piping shall be bonded to the building service equipment per CEC #250.104.

3. Do not use underground gas piping as a grounding electrode.

B. Equipment Grounding Conductor

1. Pull an Equipment Grounding Conductor, insulated green, in **ALL** conduits, both metallic and non-metallic, unless they are designated for telephone or data cables.

2. Each disconnect switch shall have an Equipment Grounding Conductor (lay in wire type) which shall be used for grounding the disconnect enclosure. The ground wire shall continue and be connected to the enclosure of the equipment served.

3. Comply with CEC Article 250 for types, sizes, and quantities of Equipment Grounding Conductors, except where specific types, larger sizes, or more conductors than required by CEC are indicated.

4. Install separate Equipment Grounding Conductor in branch circuit runs from computer area power panels or power-distribution units.

C. Terminal Cabinets

1. Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

A. General: Ground electrical systems and equipment according to CEC requirements, except where Drawings or Specifications exceed CEC requirements.

B. Grounding Rods: Locate a minimum of 1-rod length from each other and at least the same distance from any other grounding electrode.

1. Drive until tops are 2 inches below finished floor or final grade, except as otherwise indicated.

2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.

C. Grounding Conductors: Route along the shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

D. Underground Grounding Conductors: Use bare copper wire. Bury at least 24 inches below grade.

E. Bond exposed metal piping systems to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

F. Test Wells: One for each driven grounding electrode, except as otherwise indicated. Set top of well flush with finished grade or floor. Fill with 1-inch- maximum-size crushed stone or gravel.

3.4 CONNECTIONS

A. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.

2. Make connections with clean, bare metal at points of contact.

3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.

4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.

5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Non-contact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.

E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and grounding rods.

F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.

G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

H. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.5 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING

A. Manholes:

1. Install a driven ground rod close to wall and set rod depth so 4 inches will extend above finished floor.

2. If necessary, install ground rod before manhole is placed and provide a No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall.

3. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

B. Connections to Manhole Components:

1. Connect exposed-metal parts, such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole, to ground rod or grounding conductor.

2. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper conductor.

3. Train conductors level or plumb around corners and fasten to manhole walls.

4. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

3.6 FIELD QUALITY CONTROL

A. Refer to Specification Section 26 9500 “Electrical Acceptance Tests” for minimum required testing of Grounding System.

3.7 ADJUSTING AND CLEANING

A. Restore surface features, including vegetation, at areas disturbed by work of this Section. Reestablish original grades, except as otherwise indicated. Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 2 Section "Landscaping." Maintain restored surfaces. Restore disturbed paving as indicated.

END OF SECTION 26 0526

SECTION 26 95 00

ELECTRICAL ACCEPTANCE TESTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section defines the Electrical Acceptance Tests and checks that shall be made on all electrical equipment and wiring to ensure compliance with all applicable Codes and Standards, and with the requirements of the Contract Documents.

B. All electrical equipment testing and related costs shall be included in the Contractor's bid.

1.2 GENERAL REQUIREMENTS

A. The Contractor shall test equipment of all kinds installed on this project to determine whether it fulfills the requirements of these Specifications. The Contractor shall furnish all labor necessary to adjust the operation of the apparatus and make the connections for the tests. After the tests have been completed, the Contractor shall restore all connections, apparatus, etc., to their original condition.

B. The Contractor shall retain the services of a qualified Independent Testing Agency holding a valid current C-10 License to perform **certain** tests and prepare reports, as enumerated in the following Articles. The Independent Testing Agency shall be a company that specializes in electrical equipment testing and shall be NETA or NICET certified.

C. Contractor shall obtain approval from the architect of proposed independent testing agency(s) before any testing is started.

D. Electrical systems, equipment and materials shall be tested prior to final acceptance of the work.

1.3 INDEPENDENT TESTING AGENCY REQUIREMENTS

A. The Independent Testing Agency shall furnish personnel acceptable to Engineer to conduct testing. Supervising engineer shall have a minimum of five years experience in testing of equipment of the type to be tested on this Project.

B. The Independent Testing Agency shall furnish all labor required for and incidental to testing.

C. The Independent Testing Agency shall provide minor field repairs, adjustments, and wiring modifications at the time of inspection and testing.

D. The Independent Testing Agency shall furnish all necessary test equipment to satisfactorily perform all tests specified herein.

E. The Independent Testing Agency shall check all devices for proper operation - checking for wear, tightness, dirt, etc.

F. The Independent Testing Agency shall check for conformance to published curves.

G. The Independent Testing Agency shall notify and coordinate with the Owner's representative at least 3 working days prior to the commencement of any Electrical Acceptance Testing. Tests shall be witnessed by the Owner's representative unless such witnessing is waived in writing by the Owner's Representative.

1.4 CODES AND STANDARDS

A. Current California Electrical Code (CEC).

B. National Electrical Manufacturer's Association (NEMA).

C. Manufacturer's Instructions and Maintenance Manual applicable to each particular apparatus.

D. OSHA Rules and Regulation.

E. National Electrical Testing Association (NETA) "Acceptance Testing Specifications".

F. Procedures as directed by Engineer.

1.5 CARE AND PRECAUTIONS

A. Contractor shall be responsible for any damage to equipment or material due to improper test procedures or test apparatus handling, and shall replace or restore to original condition, any damaged equipment or material.

B. Contractor shall furnish and use safety devices such as rubber gloves and blankets, protective screens, barriers, and danger signs to adequately protect and warn all personnel in the vicinity of the tests.

1.6 EQUIPMENT TO BE TESTED BY CONTRACTOR

A. Perform the visual inspections, manual operations and tests on systems and equipment as described in Part 3, "Execution".

B. Switchboard

C. Molded Case Circuit Breakers Rated Less Than 100A

D. Power Cable

E. Service, Distribution and Motor Control Equipment

F. Disconnect Switches

G. Motors

1.7 EQUIPMENT TO BE TESTED BY INDEPENDENT TESTING AGENCY

A. Circuit Breakers Rated 100A and Greater

B. Grounding System

1.8 SUBMITTALS

A. Submittals for this Section shall be made according to the Conditions of the Contract, Division 1 Specification Sections and Specification Section 260100.

B. Test Reports

1. Provide written test reports, signed and dated, for all tests prior to acceptance of the tested equipment by the Owner.

2. All tests shall be recorded on the following forms:

a. 269500 - 1 MULTIPLE CONDUCTOR CABLE MEGGER TEST, 300V AND LESS

b. 269500 - 2 SINGLE & MULTIPLE CONDUCTOR POWER CABLE MEGGER TEST, 600V AND LESS

3. Submit certified reports of Independent Tests and Observations indicating and interpreting test results specified in Part 3 of this Section.

a. The Test Report shall include the following:

1) Description of equipment tested.

2) Description of test procedure.

3) Calibration record for all testing devices used.

4) Test results.

5) Recommendations.

6) Appendix, including all field test reports.

b. Furnish six copies of completed report to the Electrical Engineer no later than ten days after test completion unless requested otherwise by Owner.

c. Instrumentation-Traceability: The testing agency shall provide calibration labels for all relays and circuit breakers tested.

d. Labels shall be self-adhesive and placed on covers or frames so as not to obscure nameplate, tap block or time dial. Label shall indicate date tested and firm name.

PART 2 - PRODUCTS

2.1 TESTING EQUIPMENT

A. Furnish suitable electrical instruments including voltmeters, ammeters, wattmeters, tachometers and all other equipment necessary to perform tests specified.

B. Make necessary openings in circuits for testing instruments and place and connect all instruments, equipment and devices necessary for the tests. Upon completion of tests, remove instruments and instrument connections and restore all circuits to permanent condition.

2.2 TESTING COORDINATION

A. Coordinate activities and cooperate with others on the Project to ensure that systems are energized when required, when loads are applied, and that other requirements of this Section of the Specifications are carried out in a timely, coordinated basis.

B. Conduct tests in the presence of the Construction Manager. Notify the Construction Manager seven calendar days or more in advance when any test is to be performed, and do not start tests without the permission of the Construction Manager.

C. Make up no permanent connections until correct phase sequence of all equipment is determined.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall provide Acceptance Testing on the entire Electrical System. Certain of this testing shall be performed by an Independent Testing Agency as indicated.

B. Acceptance Testing shall include Visual Inspections, Manual Operations, Electrical Tests, and Functional Testing.

C. Whenever possible, all Visual Inspections, Manual Operations and Electrical Tests shall be made just prior to energizing the equipment or circuits, and shall be coordinated with the field schedule and field conditions.

D. Test reports on megger, dielectric absorption and high potential tests shall include the ambient temperature and relative humidity existing at the time of the tests.

E. Should any piece of apparatus or any material or work fail during any of these Tests, it shall be immediately removed and be replaced by perfect material by this Contractor at his expense and the portion of the work replaced be again tested by the Contractor.

F. Before testing and energizing a system, all necessary precautions shall be taken to ensure the safety of personnel and equipment. All conductors and all electrical equipment shall be properly insulated and enclosed. All enclosures for conductors and equipment shall be properly grounded. Insulation resistance measurements must have been made and approved on all conductors and energized parts of electrical equipment.

1. During actual testing, the Contractor or Independent Testing Agency shall:

a. Ensure that temporary power terminations are connected in such a manner that commercial power may be restored in forty-five minutes upon request.

b. Place temporary power cables out of the way in a safe manner that provides no hazard to personnel or equipment in the area.

c. Provide all special connections required.

d. Conduct all tests in presence of the representative except where advised this would not be necessary.

G. The entire installation shall be free from short circuits and improper grounds. Panels and circuits shall be tested for grounds and shorts with mains disconnected from the feeder, branches connected, lamps removed or omitted from the sockets and all wall switches closed. Each individual circuit shall be tested at the panel with the equipment connected for proper operation

H. The following minimum tests are required, but shall not be limited to this list. Tests will be supervised and witnessed by the Construction Manager:

1. Proper phase rotation.

2. Short circuits.

3. Improper grounds.

4. Power and control electrical circuits for circuit continuity and function test.

I. Furnish all personnel, labor, meters, instruments, cable, connections, equipment and apparatus necessary for making all tests.

J. Check and test all switchboards, transformers, panelboards, feeders, power and control cables, communication system devices and wiring, and all connections to all equipment.

K. After wires and cables are in place and connected to devices and equipment, the system shall be tested for short circuits, improper grounds, and other faults. If fault condition is present, the trouble shall be rectified and the wiring system shall be retested.

L. A voltage test shall be made at each lighting panel, distribution panel and at the last outlet on each circuit. If drop in potential exceeds one percent, correct the condition by locating the ground or high resistance splice or connection and retest.

M. Any wiring device, electrical apparatus, or lighting fixture grounded or shorted on any integral "live" part, shall be removed and the trouble rectified by replacing the defective parts or materials.

N. All final tests shall be witnessed by the Construction Manager and three copies of the verified test results shall be given to the Architect/Engineer and Construction Manager promptly upon completion of a test.

O. Provide assistance to the various equipment manufacturers' field engineers as required in the testing and adjusting of the electrical power and control equipment. Cooperation shall be such that a minimum of time is required for equipment testing.

P. A log shall be maintained for all tests. This log shall be certified before completion of the project, both as to test value and date of test. All major equipment such as the switchboard and panelboards shall be energized initially in the presence of the Construction Manager.

Q. The Owner reserves the right to operate any system or equipment prior to final completion and acceptance of the work. Such preliminary operation shall not be construed as an acceptance of any work. Each piece of equipment and all of the systems shall be adjusted to insure proper functioning and shall be left in first class operating condition.

3.2 VISUAL INSPECTIONS

A. Prior to Manual Operation and Electrical Testing, perform Visual Inspections to verify the following:

1. The equipment is completely and properly installed.
2. The equipment is free from damage and defects.
3. Shipping blocks and restraints have been removed.
4. Electrical terminations have been properly tightened.
5. The equipment has been properly aligned.
6. The equipment has been properly lubricated.
7. The ventilation louvers are open and unobstructed.
8. Voltages and phases have been properly identified.
9. Terminations in control panels have been properly identified.
10. The equipment is ready to be tested

3.3 MANUAL OPERATION

A. Prior to any Electrical Testing, mechanical devices shall be exercised or rotated manually to verify that they operate properly and freely.

3.4 ELECTRICAL TESTS BY CONTRACTOR

A. Switchboard

1. The Contractor shall perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification, Sections 7.1, 7.6, 7.9, 7.10, 7.11, and 7.14, as appropriate. Certify compliance with test parameters.
2. Switchboard and completed installation shall be inspected for adequate size, bus spacing, bracing, physical damage, proper alignment, anchorage and grounding.
3. Switchboard frame will be inspected for alignment, level, and anchorage.
4. Check tightness of accessible bolted bus joints using calibrated torque wrench per manufacturer's recommended torque value. All bus bolts will be torqued to their proper value. A mark to be placed on each tightened bolt to ensure completeness.

5. Switchboard interior will be vacuumed and wiped clean.

6. The following tests and checks shall be performed before placing in operation:

   a. Check all new bus and cable connections for proper contact pressure and mark each bolt with a red “dot” of paint to indicate it has been checked.

   b. Check all the new equipment for mechanical adjustment, lubrication, and freedom of operation. Remove all shipping blocks.

   c. Operate and test trip units for all new breakers.

   d. Test all transfer switches and associated control circuits for correct connection and operation.

   e. Test all panel feeders and main breakers.

   f. Test ground fault systems by operating push-to-test button.

   g. Physically test key interlock systems to check for proper functionality.

7. Using a Megger, measure the insulation resistance of each bus section phase-to-phase and phase-to-ground for one minute each, at minimum test voltage of 1000VDC. Minimum acceptable value for insulation resistance is one (1) megohm. Refer to manufacturer’s literature for specific testing procedure.

B. Molded Case Circuit Breakers rated less than 100A

1. Circuit breakers will be operated manually several times to ensure smooth operation.

2. Molded case will be inspected for cracks.

3. Rated current will be passed through each phase and millivolt readings taken across contacts.

4. Time current characteristic tests will be performed by passing 300% rated current through each phase and monitoring trip time.

5. Instantaneous pickup current will be determined by finding the current level at which the breaker trips out in less than 2 cycles.

6. Insulation resistance tests will be performed at 1000 Volts DC.

7. Circuit breaker covers will be removed on unsealed units and checked for cracks. Interphase barriers and arc chutes to be inspected. All bolts and lugs will be tightened. All internal auxiliary devices will be inspected.

8. Contacts, shunts, etc., will be visually inspected for wear and alignment.

9. Inverse trip time, instantaneous pickup current and millivolt drop across contacts, insulation resistance values, as well as deficiencies causing breaker to function outside published limits will be recorded. Times will then be compared with manufacturer’s or NEMA published values.

C. Power Cable

1. The 600-volt insulated wires and cables shall be factory tested prior to shipment in accordance with ICEA Standards for the insulation specified.

2. Perform a continuity check and a 1,000 volt DC megger test on 600 volt power cables No. 6 AWG and larger.

   a. The megger test shall be performed between each pair of conductors and from each conductor to ground.

   b. The megger test shall be performed for 15 seconds or until the insulation resistance value stabilizes.

   c. The insulation resistance between conductors and from each conductor to ground shall be 100 megohms minimum in one minute or less. In addition, the lowest insulation resistance value shall not differ from the highest value by more than 20 percent.

3. Phase conductors, if shorted, grounded or at fault shall be removed, shall be replaced and the wiring system shall be retested.

D. Service, Distribution and Motor Control Equipment

1. Megger tests shall be performed at a DC voltage of 1,000 volts for 600 volt rated equipment, and at 500 volts for 120-300 volt rated equipment.

2. Perform a 1,000-volt megger test on buses, motor starters and disconnect switches. This test may be combined with the feeder cable megger test by testing the devices and terminated cables together.

3. Perform a continuity check on motor control circuits and control panel internal wiring.

4. Perform an operational test on the controls.

5. Perform a continuity check and a 1,000-volt DC megger test on 3 phase distribution and isolation transformers.

E. Disconnect Switches

1. Check for cleanliness of contacts, operation, etc.

2. Lubricate contacts and mechanical devices.

3. Check fuse-clip tightness.

4. Perform a 1,000-volt megger test on disconnect switches rated for 600V and at 500 volts for disconnect switches rated for 240V.

F. Motors

1. Perform a 1,000-volt megger test on 460 volt, 3 phase motors, and a 500 volt megger test on 200-230 volt, 3 phase motors.

2. “Bump” motors to verify proper direction of rotation.

3. Run motors and check for vibration and overheating.

4. Refer to Division 27 Sections of these Specifications for testing.

3.5 INDEPENDENT AGENCY TESTING

A. Circuit Breakers rated 100A or greater

1. All circuit breakers, 100 amps or more, shall be tested by an independent testing agency in accordance with NETA specifications and a report submitted to the architect. Any circuit breaker that does not pass the test shall be replaced.

2. Circuit breakers will be operated manually several times to ensure smooth operation.

3. Molded case will be inspected for cracks.

4. Rated current will be passed through each phase and millivolt readings taken across contacts.

5. Time current characteristic tests will be performed by passing 300% rated current through each phase and monitoring trip time.

6. Instantaneous pickup current will be determined by finding the current level at which the breaker trips out in less than 2 cycles.

7. Insulation resistance tests will be performed at 1000 Volts DC.

8. Circuit breaker covers will be removed on unsealed units and checked for cracks. Interphase barriers and arc chutes to be inspected. All bolts and lugs will be tightened. All internal auxiliary devices will be inspected.

9. Contacts, shunts, etc., will be visually inspected for wear and alignment.

10. Inverse trip time, instantaneous pickup current and millivolt drop across contacts, insulation resistance values, as well as deficiencies causing breaker to function outside published limits will be recorded. Times will then be compared with manufacturer's or NEMA published values.

11. The testing agency shall provide calibration labels for all relays and circuit breakers tested. Labels shall be self-adhesive and placed on covers or frames so as not to obscure nameplate, tap block or time dial. Label shall indicate date tested and firm name.

B. Grounding System

1. Test shall be performed for every new **SEPARATELLY DERIVED AC SYSTEM.**

2. Ground tests shall meet the requirements of the California Electrical Code and comply with UL 467. The grounding electrode system at the main electrical service equipment shall be tested by an Independent Testing Agency in accordance with the three point fall of potential method as specified in IEEE Standard 81-1983. Maximum ground resistance shall be 5 OHMS. A copy of the test report shall be submitted to the architect and engineer of record.

3. Maximum grounding to resistance values are as follows:

a. Equipment Rated 500 kVA and Less: 5 ohms.

b. Equipment Rated 500 to 1000 kVA: 5 ohms.

c. Equipment Rated More than 1000 kVA: 3 ohms.

4. Tests: Subject the completed grounding system to a megger test at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than 2 full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the 2-point method according to IEEE 81.

5. The test agency shall remove the test link between the ground and neutral, and test the neutral for any parallel and/or superfluous ground paths. If any are found, a report should be given to the Engineer. No grounds are to be removed unless authorized in writing.

6. Ground electrode resistance shall be taken using a Biddle ground resistance meter and readings given to the report.

7. All ground connections in switchboard as well as that to cold water pipes shall be check for tightness and adequacy.

8. Measure the resistance to ground of each ground rod [in a ground mat] before connection to the other ground rods. The resistance shall not exceed 10 ohms.

9. Measure the resistance to ground of the total ground system with all connections completed. The resistance shall not exceed 2 ohms for primary services or 5 ohms for secondary services.

10. Tests of the resistance to ground shall be made using either the three point method or the fall-of-potential method.

11. Perform a continuity check from equipment ground bus bars and ground lugs to the ground system.

12. Ground rods for manholes and light poles need not be tested.

13. Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify Owner promptly and include recommendations to reduce ground resistance and to accomplish recommended work.

14. Report: Prepare test reports, certified by the testing organization, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

3.6 FUNCTIONAL TESTING

A. All automatic and manual functions shall be checked for proper operation.

B. All indicating circuits, lights and alarms shall be tested for correct operation. Burned out indicators shall be re-lamped.

C. Upon completion of the Work, place the entire installation in operation, test for proper function, and show systems and equipment to be free of defects.

END OF SECTION 26 9500

FORM 269500 – 1

MULTIPLE CONDUCTOR CABLE MEGGER TEST, 300 VOLTS & LESS

WIRING - SIGNAL & COMMUNICATION CABLE

Testing shall be performed before connecting the cables to the terminals at either end. Continuity of each conductor shall be checked at this time. Each conductor shall be checked with a 500 volt megger to ground, with all other conductors in the cable and shield, grounded. The minimum acceptable megger resistance shall be 50 megohms for each conductor to ground.

PROJECT NAME _____

FEEDER NUMBER_____ LOCATION_____

CABLE SIZE _____ CABLE LENGTH_____

NO. OF CONDUCTORS _____ INSULATION TYPE_____

MANUFACTURER _____ LINE VOLTAGE_____

TEMPERATURE _____ HUMIDITY_____

MEGGER TYPE _____ SERIAL NUMBER_____

TEST VOLTAGE _____ MULTIPLIER_____

REMARKS_____

CONDUCTOR NO.	MEGOHMS		CONTINUITY		CONDUCTOR NO.	MEGOHMS		CONTINUITY	
	C/C	C/S	PASS	FAIL		C/C	C/S	PASS	FAIL

TEST PERFORMED BY_____ _____

Signature Date

TEST WITNESSED BY_____ _____

Signature Date

FORM 269500 – 2

SINGLE & MULTIPLE CONDUCTOR POWER CABLE MEGGER TEST, 600 VOLTS & LESS

WIRING – FEEDER CIRCUITS

Testing shall be performed before connecting the cables to the terminals at either end. Continuity of each conductor shall be checked at this time. Each conductor shall be checked with a 500 volt megger to ground, with all other conductors (including shield) in the conduit or cable grounded. The minimum acceptable megger resistance shall be 50 megohms for each conductor to ground.

PROJECT NAME _____

FEEDER NUMBER_____ LOCATION_____

CABLE SIZE _____ CABLE LENGTH_____

NO. OF CONDUCTORS _____ INSULATION TYPE_____

MANUFACTURER _____ LINE VOLTAGE_____

TEMPERATURE _____ HUMIDITY_____

MEGGER TYPE _____ SERIAL NUMBER_____

TEST VOLTAGE _____ MULTIPLIER_____

REMARKS_____

Cable No	MEGOHMS Phase A	MEGOHMS Phase B	MEGOHMS Phase C

TEST PERFORMED BY_____ _____

Signature Date

TEST WITNESSED BY_____ _____

Signature Date

SECTION 31 11 00

SITE CLEARING, STRIPPING, AND GRUBBING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
1. Clearing, stripping, and grubbing
2. Removing surface debris.
3. Removing designated paving, concrete slabs, curbs, gutters and fencing.
4. Removing designated trees, shrubs, and other plant life.
5. Removing abandoned utilities.
6. Excavating topsoil.

B. Related Sections include but are not necessarily limited to:
1. Section 31 23 00 – Earthwork.

1.02 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Product Data: Submit data for herbicide. Indicate compliance with applicable codes for environmental protection.

1.03 DESCRIPTION

A. Clearing:
1. Remove and dispose of concrete curbs, gutter and slabs; asphalt concrete pavement and other hardscape improvements as shown on the plans.
2. Remove and dispose of trees, snags, stumps, shrubs, brush, limbs, sticks, branches and other vegetative growth.
3. Remove and dispose of rocks, tiles, trash piles, rubbish, and fencing.
4. Protect structures and piping above and below ground, trees, shrubs, vegetative growth and fencing not designated for removal.

B. Stripping:
1. Remove and dispose of organic sod, topsoil to a depth of 3-inches, grass and grass roots, and other objectionable material.

C. Grubbing:
1. After clearing and stripping, remove and dispose of wood or root matter, including stumps, logs, trunks, roots, or root systems greater than 1.5 inches in diameter or thickness to a depth of 3-feet below the ground surface.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Trees and Shrubbery: Existing trees, shrubbery and other vegetative material may not be shown in the plans. Inspect the site as to the nature, location, size and extent of vegetative material to preserved, as specified herein.

PART 3 -EXECUTION

3.01 PREPARATION

A. Call Underground Service Alert (USA) at 811 not less than three working days before performing Work.

B. Verify location of existing utilities and benchmarks before starting work.

C. Verify existing plant life designated to remain is tagged or identified.

3.02 PROTECTION

A. Protect existing trees and other vegetation to remain against damage.
   1. Do not smother trees by stockpiling construction materials or excavated materials within drip line.
   2. Avoid foot or vehicular traffic or parking of vehicles within drip line.
   3. Provide temporary protection as required.

B. Repair or replace trees and vegetation damaged by construction operations.
   1. Repair to be performed by a qualified tree surgeon.
   2. Remove trees that cannot be repaired and restored to full-growth status and replace with new trees of minimum 4-inch caliper.

C. Protect utilities, benchmarks, and survey control points from damage or displacement.

3.03 SITE CLEARING

A. Topsoil Removal:
   1. Strip topsoil to depths encountered.
      a. Remove heavy growths of grass before stripping.
      b. Stop topsoil stripping sufficient distance from such trees to prevent damage to main root system.
      c. Separate from underlying subsoil or objectionable material.
   2. Stockpile topsoil where directed by Engineer.
      a. Construct storage piles to freely drain surface water.
      b. Seed or cover storage piles to prevent erosion in compliance with SWPPP.
   3. Do not strip topsoil in wooded areas where no change in grade occurs.
   4. Borrow topsoil: Reasonably free of subsoil, objects over 2-inch DIA, weeds and roots.

B. Clearing and Grubbing:
   1. Clear from within limits of construction all trees not marked to remain.
      a. Include shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, structures and debris.
   2. Grub (remove) from within limits of construction all stumps, roots, root mats, logs and debris encountered.
      a. Totally grub under areas to be paved.
      b. Grubbing in vegetated areas: totally grub.
         1) Where fill is 3 ft or more in depth, stumps may be left no higher than 6-inches above existing ground surface.

C. Disposal of Waste Materials:
   1. Do not burn combustible materials on site.
   2. Remove all waste materials from site.
   3. Do not bury organic matter on site.

3.04 ACCEPTANCE

A. Upon completion of the site clearing, obtain Engineer's acceptance of the extent of clearing, depth of stripping and rough grade.

END OF SECTION

SECTION 31 23 00

EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
1. Materials, testing, and installation for excavations, fills, and backfills.

B. Related Sections include but are not necessarily limited to:
1. Section 31 11 00 – Site Clearing, Stripping and Grubbing.
2. Section 31 23 16 – Trenching, Backfilling and Compacting.

C. For additional information, refer to the Geotechnical Investigation Report by Salem Engineering Group Geotechnical Engineering Investigation, Tulare County Transit Operations & Maintenance Facility, Tulare, California, July 27, 2016 (Revised November 21, 2016).

1.02 REFERENCES

A. ASTM International (ASTM):
1. D1556 – Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
2. D1557 – Standard Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18-Inch Drop.
3. D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. D2487 – Standard Test Method for Classification of Soils for Engineering Purposes.
5. D2488 – Practice for Description and Identification of Soils (Visual-Manual Procedure).
6. D2937 – Test Method for Density of Soil in Place by the Drive-Cylinder Method.
7. D2974 – Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
8. D6938 – Standard Test Methods for Density and Moisture Content of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).
9. E699 – Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM.

B. California Department of Transportation Standard Specifications, 2010 edition:
1. CTM 216 Dry – California Test Method for Relative Compaction of Treated and Untreated Soils.
2. CTM 231 - Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates Using Nuclear Gages.
3.
4. CTM 301 – California Test Method for the Determination of the Resistance “R” Value of Treated and Untreated Bases, Sub-bases, and Basement soils by the Stabilometer.

1.03 DEFINITIONS

A. Excavation consists of removal of material encountered during stripping and as required for removal of existing underground facilities indicated. It also includes disposal or temporary stockpile of material removed.

B. Unauthorized excavation consists of removal of materials beyond indicated elevations or dimensions without specific direction of the Contract Administrator. Unauthorized excavation, as well as remedial work directed by the Contract Administrator, shall be at Contractor's expense.
   1. Under footings, foundation bases, fill-authorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to the Engineer.
   2. In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of the same classification, unless otherwise directed by the Engineer.

C. Additional Excavation:
   1. When excavation has reached required subgrade elevations; notify the Engineer who will make an inspection of conditions. If the Engineer determines bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by the Engineer.
   2. Removal and replacement of unsuitable material as directed will be paid on basis of Conditions of the Contract relative to changes in work.

D. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.

E. Structure: Foundations, slabs, tanks, vaults, or other man-made stationery features occurring above or below ground surface.

F. Stripping: Removal of the top soil, surface vegetation and any miscellaneous obstructions prior to site grading.

G. Over-excavation: Excavation to minimize the potential soil movement due to settlement to provide uniform support for proposed structures. Over-excavation is generally reserved for soils that in their natural state will not provide adequate bearing capacity for structures.

H. Engineered Fill: Fill Material upon which the geotechnical engineer has made sufficient tests and observations to enable them to issue a statement that, in their opinion, the fill has been placed and compacted in accordance with the specification requirements and to the satisfaction of the Engineer.

I. Trench Backfill: Trench backfill shall consist of material placed between the pipe zone backfill/bedding and subgrade in paved areas or to the top of the trench in unpaved areas, unless otherwise shown or specified in the Contract.

J. Undocumented Fill Materials: Fill Material which does not classify as Engineered Fill suitable to support future structures.

K. Scarify: Breaking the surface of the soil to prepare it for water conditioning and compaction as directed.

1.04 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Submit excavation and shoring drawings for worker protection in accordance with the General Provisions.

C. Submit six copies for materials acceptance reports from an approved testing laboratory verifying that the material meets the project requirements at least two weeks prior to use.

D. Furnish copy of dust control permit to Construction Manager prior to earthwork.

1.05 QUALITY ASSURANCE

A. Testing and Inspection Services: The County Materials Lab will perform soils testing and inspection services during earthwork operations.

B. Determine the density of soil in place by the Cal 216 Wet test method or by nuclear gage method Cal 231. Compaction tests will be performed for each lift or layer.

C. Determine laboratory moisture-density relationship of soils per Cal 216 Wet test methods. If nuclear methods are used for in-place density determination, the compaction test results for maximum dry density and optimum water content shall be adjusted in accordance with Cal 231. This will be required for determination of percent relative compaction and moisture variation from optimum.

D. Determine the relative density of cohesion-less soils per ASTM D4253 and D4254.

E. Sample materials per ASTM D75.

F. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density.

G. Compaction shall be deemed to comply with the specifications when no more than one test of any three consecutive tests falls below the specified relative compaction. The one test shall be no more than three percentage points below the specified compaction percentage and shall be within two percentage points of the optimum moisture as determined by the optimum moisture-density relationship of soils test method. The Contractor shall pay the costs of any retesting of work not conforming to the specifications.

1.06 DISPOSAL OF EXCESS MATERIALS

A. Excess materials and waste from earthwork operations shall be disposed of on-site by the Contractor at his expense at the location shown on the Plans.

1.07 MATERIAL AVAILABILITY

A. Sufficient earthwork material to complete the work is available at the site. Excess material haul-off is required per Section 1.06 A.

PART 2 – PRODUCTS

2.01 ENGINEERED FILL

A. General: Refer to the Geotechnical Investigation Report (GIR) noted in Section 9.4.

B. Engineered Fill is material to be placed beneath structures or pavements to the limits indicated on the drawings.

C. Engineered Fill material shall be free of organics and other debris and less than 3-inches in maximum dimension. Native soils may be used if they contain objects less than 3-inch in maximum dimension and contain less than 3 percent organic materials by weight (ASTM D2974).

D. Import Fill to be used as Engineered Fill shall be non-hazardous, non-corrosive, be derived from a single, consistent source and meet the following criteria (ref. GIR Table 9.4.2):
   1. Gradation (ASTM C136)
   2. Expansion index (ASTM D4829)
   3. Plasticity (ASTM D4318)

2.02 ENGINEERED BACKFILL

A. General: Refer to the Geotechnical Investigation Report (GIR) noted in Section 9.4.

B. Engineered Backfill is material to be placed adjacent to and around piping, structures, and areas not subject to adjacent structure foundation loading (areas not subject to adjacent structure foundation loading are areas from a distance 5-feet beyond the edge of structural slab or footing).

C. Engineered Backfill and Imported Fill to be used as Engineered Backfill shall comply with the requirements of Engineered Fill.

2.03 FILL

A. Fill material is material that is to be placed in locations that are not to be constructed as engineered fill or backfill. Fill material may be native material.

2.04 SAND

A. Sand is granular material free from clay balls, organic matter, and other deleterious substances.

B. Sand shall be of such size that 90 percent to 100 percent will pass the number 4 sieve and not more than 5 percent will pass the number 200 sieve per Caltrans Sand bedding specification.

C. Sand shall have a minimum sand equivalent of 30.

2.05 WATER FOR COMPACTION

A. Water shall be free of organic materials and shall have a pH of 7.0 to 9.0, a maximum chloride concentration of 500-mg/L, and a maximum sulfate concentration of 500-mg/L. Provide all water needed for earthwork. Provide temporary piping and valves to convey

water from the source to the point of use. Provide any meters if the water is taken from a city, county, water district, or agency pipeline.

2.06 AGGREGATE BASE

A. Use ¾-inch maximum, Class 2 Aggregate base material per Caltrans Standard Specifications, Section 26 and Section 32 11 23 – Aggregate Base Courses.

PART 3 – EXECUTION

3.01 DEWATERING

A. Provide and operate equipment adequate to keep excavations and trenches free of water. Dewater subgrade to a minimum of 3-feet below bottom of excavation. Remove water during period when concrete is being deposited, when pipe is being laid, and during the placing of backfill. Avoid settlement or damage to adjacent property. Dispose of water in a manner that will not damage adjacent property. When dewatering open excavations, dewater from outside the structural limits and from a point below the bottom of the excavation. Obtain and comply with discharge permit from Tulare County.

3.02 EXCAVATION

A. General: Refer to the Geotechnical Investigation Report (GIR) noted in Section 9.1.

B. Excavation is unclassified. Perform excavation regardless of the type, nature, or condition of the material encountered to accomplish the construction. Do not operate excavation equipment within 5-feet of existing structures or newly completed construction. Excavate with hand tools in these areas.

C. After the required excavation has been completed, the Engineer will observe the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation is to be conducted in all areas within the influence of the structure where unacceptable subgrade materials exist at the exposed subgrade.

D. The Contractor will not receive any additional payment for refill material used for his convenience.

E. Excavations shall have sloping, sheeting, shoring, and bracing conforming with 29CFR1926 Subpart P-Excavations, CAL/OSHA requirements, and the General Provisions.

3.03 LIMITS OF FOUNDATION EXCAVATION

A. General: Refer to the Geotechnical Investigation Report (GIR) noted in Section 9.1.

B. Excavate to the depths and widths needed to accomplish the construction. Allow for forms, working space, engineered backfill, and site grading. Do not excavate for footings, slabs, or conduits below elevations indicated. Unless unacceptable material is encountered and over-excavation is authorized by the County or stated in the GIR, backfill over-excavations with compacted Engineered Backfill material. Correct cuts below grade by benching adjoining areas and creating a smooth transition. The Contractor shall bear all costs for correcting unauthorized overexcavated areas.

3.04 PREPARATION FOR PLACING FILL OR BACKFILL

A. General: Refer to the Geotechnical Investigation Report (GIR) noted in Section 9.5.

3.05 PLACING AND COMPACTING FILL AND ENGINEERED FILL

A. Excavated material may be used for fill and engineered fill providing materials meet the specified requirements for structure fill, backfill, and fill material.

B. General: Refer to the Geotechnical Investigation Report (GIR) noted in Section 9.5.

C. Where fill is to be constructed on slopes steeper than 5:1, bench the fill into competent undisturbed materials as the fill progresses up the slope. Benches shall be sloped at least 2% into the slope and shall be of a width at least equal to the height of fill lift.

3.06 PREPARATION OF FOUNDATION SUBGRADE

A. General: Refer to the Geotechnical Investigation Report (GIR).

B. The finished subgrade for foundations and equipment slabs shall be within a tolerance of ±0.08 of a foot of the grade and cross section indicated, shall be smooth and free from irregularities, and shall be at the specified relative compaction.

C. Compact the top 12-inches of the subgrade to 92% relative compaction unless noted otherwise in the GIR. Recompaction will not be required if rock is exposed at final subgrade.

D. Remove soft material encountered and replace with engineered backfill. Fill holes and depressions to the required line, grade, and cross sections with engineered backfill.

E. If rock is encountered at final grade, overexcavate to a depth of 6-inches and place engineered backfill to establish final grade.

3.07 MOISTURE CONTROL

A. During the compacting operations, maintain optimum practicable moisture content required for compaction purposes in each lift of the material. Maintain uniform moisture content throughout the lift. Insofar as practicable, add water to the material at the site of excavation. Supplement by sprinkling the material. At the time of compaction, the water content of the material shall be at optimum water content or within 2 percentage points above optimum. Aerate material containing excessive moisture by blading, discing, or harrowing to hasten the drying process.

3.08 SITE GRADING

A. Perform earthwork to the lines and grades shown in the drawings. Shape, trim, and finish slopes of channels to conform to the lines, grades, and cross sections as shown. Remove exposed roots and loose rocks exceeding 3-inches in diameter. Round tops of banks to circular curves of not less than a 6-foot radius. Neatly and smoothly trim rounded surfaces. Do not overexcavate and backfill to achieve the proper grade.

3.09 MAINTENANCE

A. Protection of Graded Areas: Graded areas shall be protected, and kept free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

E. Maintain dust control on a continuous basis in accordance with the Standard Specifications.

3.10 EXCAVATION NEAR EXISTING UTILITIES AND STRUCTURES

A. As the excavation approaches pipes, conduits, or other underground structures, not designated for demolition or specifically designated to preserve, discontinue digging by machinery and excavate by means of hand tools. Such manual excavation is incidental to normal excavation and is included in the work to be done under items involving normal excavation.

B. Where determination of the exact location of a pipe or other underground structure is necessary for doing the work properly, excavate test pits to determine such locations. Such test pits are incidental to other excavation, and the work is understood to be included as a part of the excavation.

C. Existing Structures: Support and protect from damage all existing pipes, poles, wires, fences, guard rails, curbing, catch basins, manholes, property line markers, and other structures which do not require temporary or permanent relocation.

D. Restore or replace damaged items, without compensation, to the condition in which they were found immediately before the work under this project was begun.

E. Survey Monuments: Replace survey monuments that are disturbed or removed. Work shall be preformed by a Licensed Land Surveyor at the Contractor’s expense.

3.11 CARE AND RESTORATION OF PROPERTY

A. General: Do not operate tractors, bulldozers, or other power-operated equipment on paved surfaces if the treads or wheels of the equipment are so shaped as to cut or otherwise injure the surfaces.

B. Restore all surfaces, including planted areas, which have been injured by the Contractor's operations, to a condition at least equal to that in which they were found immediately before the work was begun. Use suitable materials and methods for such restoration. Maintain all restored plantings by cutting, trimming, fertilizing, etc., until

acceptance. Restore existing property or structures as promptly as practicable and do not leave until the end of construction period.

3.12 EROSION CONTROL

A. Comply with the requirements of the SWPPP.

3.13 DUST CONTROL:

A. Obtain a dust control permit from the San Joaquin Valley Air Pollution Control District, (559) 230-5900, prior to performing earth disturbing activities. Prevent a dust nuisance from originating from the site of the work as a result of contractor operations, or the traveling public, during the effective period of this contract.

B. Take preventative measures to control dust emissions including but not limited to the following:
   1. Apply water to all unpaved areas as required to prevent the surface from becoming dry enough to permit dust formation.
   2. Keep paved surfaces over which vehicular traffic is permitted to travel free of dirt. In residential areas, use a self-contained, pick-up type, power broom with water distribution system.

C. Temporary suspension of the work, either as a result of order by the Engineer, or as a result of conditions beyond the control of the Contractor shall not relieve the Contractor from his responsibility for dust control as set forth herein.

3.14 COMPACTION:

A. Comply with the compaction requirements are shown on the plans and specified herein.

END OF SECTION

SECTION 31 23 16

TRENCHING, BACKFILL, AND COMPACTION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section includes:
   1. Trenching, backfilling, and compacting for utilities.

B. Related Sections include but are not necessarily limited to:
   1. Section 31 11 00 – Site Clearing, Stripping, and Grubbing
   2. Section 31 23 00 – Earthwork.

C. For additional information, refer to the Geotechnical Investigation Report (GIR) by Salem Engineering Group Geotechnical Engineering Investigation, Tulare County Transit Operations & Maintenance Facility, Tulare, California, July 27, 2016 (Revised November 21, 2016).

1.02 REFERENCES

A. ASTM International (ASTM):
   1. C33– Standard Specification for Concrete Aggregates.
   2. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
   3. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
   4. D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
   5. D2922 – Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   6. D3017 – Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   7. D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
   8. D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

B. Cal-OSHA – Standards and Requirements for Trench Bracing and Shoring.

1.03 DEFINITIONS

A. Pipe Base: The trench area between the bottom of the trench and the bottom of the pipe. Extend full width and length of trench.

B. Pipe Zone: Area of trench between the bottom of the pipe and a minimum of 12-inches above the pipe, unless otherwise indicated. Extend full width and length of trench.

C. Backfill Zone: Area above Pipe Zone.

D. Relative Compaction: Field-measured dry weight expressed as a percent of maximum dry density of same soil determined in accordance with ASTM D1557.

E. Unclassified Excavation: Nature of materials to be encountered is not identified or described.

1.04 DESCRIPTION

A. Provide materials, services, and equipment required for trenching, backfilling and compaction.

B. Trenching and backfilling shall have the approval of the Engineer. Work shall be done only under the general observation and, where required, the detailed inspection of the Engineer. Do not backfill until each specific location is approved.

C. Retain an independent soils laboratory to conduct in-place moisture-density tests for backfilling to assure that all work complies with this Section.

1.05 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Test Reports: Submit results of independent testing and laboratory specified tests.

PART 2 – PRODUCTS

2.01 PIPE BASE AND PIPE ZONE BACKFILL MATERIAL

A. Use sand conforming to ASTM C33 for PVC pipe, polyethylene encased ductile iron pipe, and conduit less than 3-inch diameter.

B. Use crushed, partially crushed, or naturally occurring granular material, free from organic and inorganic debris, liquid limit less than 25, and plasticity index less than 9, that meets the following requirements for underground piping 3-inch or larger diameter, unless otherwise indicated:

Sieve Size	**%Passing**
Passing 1 inch	100%
Passing ¾ inch	90-100%
Passing ½ inch	30-60%
Passing ⅜ inch	0-20%
Passing No. 4	0-5%

2.02 TRENCH BACKFILL MATERIAL

A. Native material free from organic and inorganic debris and of 3-inch maximum size meeting the requirements of Engineered Backfill specified in Section 31 23 00 – Earthwork.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that native excavated material to be reused as backfill is acceptable to the County Representative.

B. Identify lines and grades.

3.02 REMOVAL OF WATER

A. At all times, provide and maintain means and devices to remove and dispose of water entering trench during preparations for and during pipe laying, and until backfill of the pipe is complete.

3.03 TRENCH EXCAVATION

A. Excavate depth and width as shown or as directed. Allow for cover and pipe base under pipe. Remove loose matter.

B. Comply with CAL-OSHA requirements regarding trench bracing and shoring.

C. If CONTRACTOR elects to slope top of trench in lieu of trench bracing, the trench width shall be maintained at least 2-feet above top of pipe before sloping begins. Sloping, unless otherwise approved by the ENGINEER, shall not be steeper than 1(H):1(V).

3.04 PIPE BASE

A. Provide pipe base for supporting pipe for full width of trench. Unless shown otherwise, minimum depth of pipe base below pipe shall be 4-inches and not less than 3-inches under pipe bell.

B. Hand-grade trench ahead of pipe laying. Provide a firm, unyielding base.

C. If trench is excavated below required depth for pipe base, fill the excess depth with pipe base to proper subgrade. Place pipe base for full width of trench in layers not exceeding 6 inches deep and compact until material does not yield or move.

3.05 PIPE ZONE

A. Use pipe zone material except where concrete encased or otherwise indicated to be backfilled. Place material simultaneously on both sides of pipe in a manner approved by the ENGINEER. Lifts not to exceed 6-inches.

B. "Walk-in" each lift of backfill. Slice with a shovel or tamp with J-bars or similar devices so that all voids around pipe are filled.

C. Give particular attention to zone from bottom of pipe-to-pipe springline. Ensure firm support to prevent lateral movement or pipe deflection during final backfilling.

3.06 BACKFILL ZONE

A. Place moisture-conditioned backfill material in lifts not exceeding 6-inches for hand operated mechanical compactors and not exceeding 8-inches for heavy equipment compactors.

B. Compact backfill as recommended by the Geotechnical Engineer of Record.

C. Ponding or jetting will not be permitted.

3.07 TESTING FOR COMPACTION

A. The OWNER will test for compaction as described in Section 31 23 00

B. Where compaction tests indicate a failure to meet the specified compaction, the Contractor shall rework the entire failed area until the specified compaction has been achieved per Caltrans Standards

3.08 FIELD QUALITY CONTROL

A. Perform field testing under provisions of Division 1 – General Requirements.

B. Perform testing as recommended by Geotechnical Engineer.

C. If tests indicate work does not meet specified requirements, remove work, replace, and test.

3.09 COMPLETION REQUIREMENTS

A. Excess materials and waste from earthwork operations shall be disposed of offsite. The OWNER has not determined or secured any sites or permits for disposal of excess material or waste.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
1. Aggregate base.
2. Aggregate base surfacing.

B. Related Sections include but are not necessarily limited to:
1. Section 31 11 00 – Site Clearing, Stripping and Grubbing.
2. Section 31 23 00 – Earthwork.
3. Section 31 23 16 – Trenching, Backfilling and Compaction.
4. Section 32 12 16 – Hot Mix Asphalt Paving.

1.02 REFERENCES

A. ASTM International (ASTM):
1. D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
3. D2922 – Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
4. D2940 – Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
5. D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
6. D1557 – Test Methods for Moisture – Density relations of soils and soil-aggregate mixtures, using 10-pound rammer and 18-inch drop.

B. Caltrans Test Methods:
1. 216 – Relative Compaction of Untreated and Treated Soils and Aggregates.
2. 217 – Method of Test for Sand Equivalent.
3. 231 - Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates Using Nuclear Gages.
4. 229 – Method Test for Durability Index.
5. 301 – Method Test for R-value Stabilometer.

C. Caltrans Department of Transportation Standard Specifications, 2010 edition:
1. Caltrans Standard Specification, Section 26 “Aggregate Base.”

1.03 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Product Data:
1. Submit data for herbicide.

C. Materials Source: Submit name of aggregate materials suppliers.

D. Manufacturer's Certificate: Certify Products meet or exceeds Caltrans Standards, Section 26.

1.04 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Caltrans standard, Section 26.

C. Maintain one copy of each document on site.

PART 2 – PRODUCTS

2.01 AGGREGATE MATERIALS

A. Aggregate Base: Provide ¾" Class II Aggregate Base in accordance with Section 26 of the Caltrans Standard Specification. Material shall be free from organic matter and other deleterious substances, capable of being compacted to form a firm, stable base; conforming to the following grading and quality requirements:

Aggregate Grading Requirements	
Sieve Size	**Percentage Passing by Weight**
1 inch	100
3/4 inch	90 – 100
No. 4	35 – 60
No. 30	10 – 30
No. 200	2 – 9

Quality Requirements	
Tests	**Requirement**
Resistance (R-value) (CTM 301)	78 min.
Sand Equivalent (CTM 217)	22 min.
Durability Index (CTM 229)	35 min.

B. Herbicide: Commercial grade guarantied for at least six months of performance.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify compacted substrate is dry and ready to support paving and imposed loads.

C. Verify substrate has been inspected, gradients and elevations are correct.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or frozen surfaces.

3.03 AGGREGATE PLACEMENT

A. Spread aggregate over prepared substrate.

B. Place aggregate equal thickness layers to total compacted thickness indicated on Drawings.
   1. Maximum Layer Compacted Thickness: 8-inches.
   2. Minimum Layer Compacted Thickness: 4-inches.
   3. Aggregate Base Surfacing Compacted Thickness: 3-inches

C. Roller compact aggregate to 95 percent maximum density as determined from test strip, in accordance with Cal 216 Wet method or Cal 231 nuclear gauge method.

D. Level and contour surfaces to elevations, profiles, and gradients indicated.

E. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.

F. Maintain optimum moisture content of fill materials to attain specified compaction density.

G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Maximum Variation From Flat Surface: ¼-inch measured with 10-foot straight edge.

B. Maximum Variation From Thickness: ¼-inch.

C. Maximum Variation From Elevation: ½-inch.

3.05 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Owner will engage a qualified independent testing and inspecting agency to field tests and inspections. Compaction testing will be performed in accordance with California Test Method 216

C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

D. Frequency of Tests: One test for every 1,000 square yards of each layer compacted aggregate.

END OF SECTION

SECTION 32 12 16

HOT MIX ASPHALT PAVING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
1. Asphalt paving.
2. Striping and markings.

B. Related Sections include but are not necessarily limited to:
1. Supplementary Conditions.
2. Section 32 11 23 – Aggregate Base Courses: Compacted base for paving.

1.02 REFERENCE STANDARDS

A. Any requirement of these Specifications shall in no way invalidate the minimum requirements of the referenced standards.
1. Caltrans Standard Specifications, State of California Department of Transportation (Caltrans), 2010, Section 39 “Asphalt Concrete”, Section 92 “Asphalt Binders”, and Section 94 “Asphaltic Emulsions."

B. American Association of State Highway and Transportation Officials:
1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

C. Asphalt Institute:
1. MS-2 – Mix Design Methods for Asphalt Concrete and Other Hot- Mix Types.
2. MS-19 – Basic Asphalt Emulsion Manual.
3. SP-2 – Superpave Mix Design.

D. ASTM International (ASTM):
1. C1371-2004a – Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
2. C1549-2004 – Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
3. D242 – Standard Specification for Mineral Filler For Bituminous Paving Mixtures.
4. D692 – Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
5. D946 – Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.

6. D977 – Standard Specification for Emulsified Asphalt.
7. D1073 – Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
8. D1188 – Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
9. D2027 – Standard Specification for Cutback Asphalt (Medium-Curing Type).
10. D2397 – Standard Specification for Cationic Emulsified Asphalt.
11. D2726 – Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
12. D2950 – Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
13. D3381 – Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
14. D3515 – Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
15. D3549 – Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
16. D3910 – Standard Practices for Design, Testing, and Construction of Slurry Seal.
17. D6690 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
18. E408-1971(1996)e1 – Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
19. E903-1996 – Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
20. E1918-1997 – Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
21. E1980-2001 – Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.03 SUBMITTALS

A. See Submittal Procedures for general submittal requirements and content.

B. Product Data:
1. Submit product information for asphalt and aggregate materials.
   a. Fog Seal Coat: Submit a 1/2-gallon sample of Asphaltic emulsion for fog seal coats in a plastic container. Take the sample from the distributor truck spray bar at mid-load.
2. Submit mix design with laboratory test results supporting design.
   a. See Supplementary Conditions for requirements.

C. Quality Assurance/Control:
1. Certificates: Certify products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

A. Obtain materials from same source throughout.

B. Perform Work in accordance with 2010 Caltrans Standard Specifications.

C. Maintain one copy copies of each document on site.

D. Qualifications:
1. Installer: Company specializing in performing work of this section with minimum 5-years documented experience approved by manufacturer.

1.05 PROJECT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

B. Weather Limitations: Operations shall be suspended when in the opinion of the ENGINEER Representative, satisfactory results cannot be achieved. In no such case shall the County be liable for additional costs. Placement of material shall comply with the requirements of Section 39-2.01C "Construction" from the Caltrans Standard Specifications.

C. Dust Control: Use all means necessary to prevent the spread of dust during performance of the work of this Section. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the job site.

D. Protection: Use all means necessary to protect pavement products before, during, and after installation, and to protect the installed work and products of all other trades. Adjacent concrete walks, curbs, aprons, and similar improvements shall be covered as required.

E. Replacements: In the event of damage, immediately make all repairs and replacements necessary, to the approval of the Engineer, and at no additional cost to the County.

F. Transport asphalt concrete mixtures from the mixing plant to the project site in trucks having tight, clean compartments. Provide covers over asphalt cement mixture when delivering to protect the mixture from weather and to prevent loss of heat. During period of cool weather or for long-distance deliveries, provide insulation around entire truck bed surfaces.

PART 2 – PRODUCTS

2.01 DESIGN CRITERIA

A. Paving: Design for movement of trucks up to 60,000-lbs.

2.02 MATERIALS

A. Asphalt Binder: Provide asphalt binder in accordance with Grade PG 64-10 performance grade asphalt, as described in Section 92, Caltrans Standard Specifications.

B. Asphalt Concrete: Use Type A, per Section 39, Caltrans Specifications.
1. Provide ¾-inch maximum aggregate, coarse grading, as defined in Section 39, Caltrans Specifications.
2. Asphalt materials shall be produced and placing in accordance with Caltrans "Standard" construction process, as described in Section 39, Caltrans Specifications.
3. The final thickness for new sections shall be 3 ½-inches of AC for parking areas and 6-inches of AC for bus areas using ¾-inch aggregate (except where otherwise specified on the Plans). The completed surfacing shall conform in all respects with the existing lines, grades, and dimensions. The pavement grades at the edge of gutter shall be ⅛-inch to ¼-inch above the concrete.

C. Primer: Use SS1 or SS1h, per Section 94, Caltrans Standard Specifications, on vertical surfaces of asphalt concrete and Portland cement concrete against which additional

asphalt concrete material is to be placed. It shall be spread at the rate of 0.05-gallons of emulsion per square yard.

D. Tack Coat: Provide a paint binder (tack coat) of asphaltic emulsion to all vertical surfaces of existing pavement, curbs, aprons, and construction joints in the surfacing against which additional material is to be placed, to existing pavement surfaces to be topped, and to other surfaces designated by the Engineer, as provided in Sections 39 and 94 of the Caltrans Standard Specifications. Furnish and apply a uniform tack coat between successive layers of asphaltic concrete.

E. Aggregate Base: Aggregate Base shall conform to Section 32 11 23 – Aggregate Base Courses.

F. Sealant: Fog Seal coat include applying slow-setting Asphaltic emulsion.

2.03 SOURCE QUALITY CONTROL

A. See General Conditions for Quality Requirements: Testing, inspection, and analysis requirements.

B. Submit proposed mix design of each class of mix for review prior to beginning of Work.

C. Test samples in accordance with Caltrans Standards.

PART 3 – EXECUTION

3.01 PREPARATION

A. Prepare aggregate base in accordance with Caltrans Standard Specifications, Section 26.

3.02 INSTALLATION

A. Construct to line, grade, and section as shown on Drawings and in accordance with referenced State Specifications.

B. Primer:
1. Apply primer on aggregate base at uniform rate of ½-gal/sq. yd.
2. Use clean sand to blot excess primer.

C. Tack Coat:
1. Apply tack coat on asphalt and concrete surfaces over subgrade surface at uniform rate.
   a. New Surfaces: ½-gal/sq yd.
   b. Existing Surfaces: ½-gal/sq yd.
2. Apply tack coat to contact surfaces of curbs, gutters, and walkways.
3. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt paving.

D. Single Course Asphalt Paving:
1. Install Work in accordance with Caltrans Standard Specifications.
2. Place asphalt within 24 hours of applying primer or tack coat.
3. Place asphalt wearing course to 2-inch compacted thickness identified in schedule at end of section thickness indicated on Drawings.

4. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
5. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

E. Double Course Asphalt Paving:
1. Place asphalt binder course within 24 hours of applying primer or tack coat.
2. Place binder course to 2-inch compacted thickness identified in schedule at end of section thickness indicated on Drawings.
3. Place wearing course within 24 hours of placing and compacting binder course. When binder course is placed more than 24 hours before placing wearing course, clean surface and apply tack coat before placing wearing course.
4. Place wearing course to inch compacted thickness identified in schedule at end of section thickness indicated on Drawings.
5. Compact each course by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
6. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

F. Asphaltic Emulsion for Fog Seal Coat
1. Apply asphaltic emulsion for fog seal coat at a residual asphalt rate from 0.02 to 0.06-gal/sq yd. Apply fog seal coat when the ambient air temperature is above 40 °F. Sprinkle water on fog seal coat that becomes tacky. If fog seal coat and seal coat with screenings are specified on the same project, apply fog seal coat at least 4 days before applying the adjoining seal coat with screenings. The joint between the seal coats must be neat and uniform.

3.03 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Flatness: Maximum variation of ¼-inch measured with 10-foot straight edge.

C. Scheduled Compacted Thickness: Within ¼-inch.

D. Variation from Indicated Elevation: Within ½-inch.

3.04 FIELD QUALITY CONTROL

A. Quality Control testing shall be performed by the Contractor in accordance with Caltrans "Standard" construction process, as defined in Section 39, Caltrans Specifications.

B. Agency will be testing in accordance with Quality Acceptance guidelines, as defined in Section 39, Caltrans Specifications.

3.05 PROTECTION

A. Immediately after placement, protect paving from mechanical injury for four hours or until surface temperature is less than 140 °F.

END OF SECTION

SECTION 32 16 13

SIDEWALKS, CURBS, GUTTERS, AND DRIVEWAYS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Sidewalks, Curbs, Gutters, and Driveways

B. Related Sections include but are not necessarily limited to:
1. Section 31 23 00 – Earthwork.
2. Section 31 23 16 – Trenching Backfilling and Compaction.

1.02 REFERENCES

A. County of Tulare Standards Specifications and Drawings.

B. California Test Method 301 – Method Test for R-value Stabil-o-meter.

C. Caltrans Standard Specifications Section 73 "Concrete Curbs and Sidewalks."

1.03 DESCRIPTION:

A. Work includes all labor, materials, and equipment to furnish, place, finish and cure concrete sidewalks, curbs, gutters, and driveways in accordance with these Standard Specifications, the Engineering Improvement Standards, and Sections 52 and 73 of the State of California Standard Specifications.

B. Tolerances:
1. Construct concrete surfaces within ¼-inch of the indicated elevation, and deviating not more than 1/8-inch from a 10-foot straightedge placed anywhere on the surface.
2. Slab tolerances shall be "straightedge tolerance" as specified in ACI 117.

1.04 SUBMITTALS

A. See Submittal Procedures for general submittal requirements and content.

B. Product Data:
1. Submit data for Concrete Mix.
2. Submit drawings that indicate the section profile of curb and gutter, and the locations of joints in concrete, including construction joints, expansion joints, isolation joints, and contraction joints.
3. Submit drawings of extruded curbs and gutters, if proposed, and any modification of the indicated section profile required by the extrusion process.
4. Submit drawings of reinforcing steel, tie bars, and connecting dowels.

1.05 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Caltrans Standard Specifications, Section 73.

C. Maintain one copy of each document on site.

PART 2 - PRODUCTS

2.01 Portland Cement: Concrete shall be composed of Portland Cement, fine aggregate, coarse aggregate and water, portioned and mixed as specified for “Type II” Portland Cement and mineral admixtures, per Section 90 of the 2015 State of California Standard Specifications.

A. Concrete Paving: Concrete shall contain five hundred ninety pounds (590-lbs) of Portland Cement per cubic yard with one inch (1”) aggregate. Five inch (5”) maximum slump. Three thousand pounds per square inch (3,000-psi) at twenty-eight (28) days for design purpose only.

B. Sidewalk, Curb, Gutter, Ramps, Driveways: Concrete shall contain five hundred and five pounds (505-lbs) of Portland Cement per cubic yard with one inch (1”) aggregate. Four inch (4”) maximum slump. Twenty-eight hundred pounds per square inch (2,800-psi) at twenty-eight (28) days for design purpose only.

2.02 MATERIALS

A. The materials for manufacturing Portland Cement Concrete shall conform to the following requirements:
   1. Portland Cement: Portland Cement used in precast products, shall be Type II cement conforming to ASTM C150, unless otherwise specified.

B. Arrange with the manufacturer of ready mixed concrete to provide adequate facilities to assure that cement meeting the requirements specified herein will be kept separate from other cement in order to prevent any but specified cement from entering the work.

C. All cement not conforming to the Standard Specifications and all cement contaminated shall be removed immediately and not used in the work.

2.03 WATER

A. In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1,000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, nor more than 1,300 parts per million of sulfates as SO4, when tested in conformance with California Test 417.

B. In non-reinforced concrete work, the water for curing, for washing aggregates and for mixing shall be free from oil and shall not contain more than 2,000 parts per million of chlorides as Cl, when tested in conformance with California Test 422, or more than 1,500 parts per million of sulfates as SO4, when tested in conformance with California Test 417.

C. In addition to the above provisions, water for curing concrete shall not contain impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

D. Water reclaimed from mixer wash-out operations may be used in mixing concrete. The water shall not contain coloring agents or more than 300 parts per million of alkalis (Na_2O + 0.658 K_2O) as determined on the filtrate. The specific gravity of the water shall not exceed 1.03 and shall not vary more than ±0.010 during a day's operations.

2.04 COARSE AGGREGATE

A. Coarse aggregate shall consist of gravel, crushed gravel, crushed rock, or combination thereof. It shall be free from deleterious coatings, roots, barks, sticks, rags and other extraneous materials.

B. Regardless of source, all coarse aggregate shall be thoroughly and uniformly washed before delivery to the work.

C. Coarse aggregate, when sampled at the batching bin, shall have a cleanness value of not less than eighty-two (82) when subjected to the cleanness test performed in accordance with Test Method No. California 227.

D. Coarse aggregates shall be furnished in the sizes determined in accordance with ASTM C136, as shown in Section 90-3.02 of the Standard Specifications.

E. The maximum size of coarse aggregate shall be as required in these Standard Specifications for the items of work requiring Portland Cement Concrete.

F. Coarse aggregate, when tested for soundness by the sodium sulfate test, ASTM C88, or CA Test Z14, shall lose not more than ten percent (10%) by weight after five (5) cycles.

2.05 FINE AGGREGATES

A. Fine aggregate shall be natural sand, well graded manufactured sand produced from larger aggregate, or a combination of natural and manufactured sand. The aggregate shall be of such character that makes possible the production of a workable concrete within the limits of water content provided in Section 10.05 of these Standard Specifications. It shall be free from deleterious coatings, roots, barks, sticks, rags, and other extraneous material.

B. When testing in accordance with the test method of ASTM C40, fine aggregate shall not indicate a color darker than the reference standard color solution unless it is determined by the Engineer that a darker color is acceptable.

C. Fine aggregate shall also comply with the requirements of Section 26 of the Caltrans Standard Specifications.

D. Fine aggregate shall be well graded and shall range in size uniformly within the limits of Section 90-1.02C(3) of the Caltrans Standard Specifications when tested in accordance with ASTM C136.

2.06 CURB RAMPS AND ADA TACTILE WARNING SURFACE

A. Where the approved Construction Drawings provide for the installation of curb ramps with the American with Disabilities Act Tactile warning surface the installation shall be in accordance with 2015 Caltrans Revised Standard Plan A88A.

2.07 READY-MIXED CONCRETE

A. Ready mixed concrete shall be delivered to the job site of the work and discharge shall be completed within one and one-half (1½) hours after the addition of the cement to the aggregates or before the drum has been revolved two hundred fifty (250) revolutions, whichever comes first. In hot weather or under conditions contributing to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and discharge shall be less than one and one-half (1½) hours, as directed by the Engineer, except that concrete shall not be discharged once the temperature of the concrete has reached eighty-five degrees Fahrenheit (85 °F).

B. Should water be added at the job site, the drum shall be revolved a minimum of twenty-five (25) revolutions after the introduction of such water.

C. The maximum size of coarse aggregate shall be as required in these Standard Specifications for the items of work requiring Portland Cement Concrete.

2.08 ADMIXTURES

A. No admixture shall be used without written permission from the Engineer or unless elsewhere provided for in these Standard Specifications or in the Special Provisions.

B. Calcium Chloride: When the use of calcium chloride is permitted, or is specified in the Special Provisions, the calcium chloride shall conform to the specifications of ASTM D98.

C. Air-Entraining Agent: When the use of an air-entraining agent is permitted, or is specified in the Special Provisions, it shall be added at the rate designated by the Engineer to result in an air content of five percent (5%) + or – 1.5% by volume in the freshly mixed concrete.

2.09 WATER REDUCING ADMIXTURE

A. Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM C494 may be used to conserve cementitious material or to facilitate any concrete construction application subject to the following conditions:
   1. When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by weight, except that the resultant cementitious material content shall be not less than 505 pounds per cubic yard.
   2. When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

B. Unless otherwise specified, a Type C accelerating chemical admixture conforming to the requirements of ASTM C494, may be used in Portland cement concrete. Inclusion in the mix design submitted for approval will not be required provided that the admixture is added to counteract changing conditions that contribute to delayed setting of the Portland cement concrete, and the use or change in dosage of the admixture is approved in writing by the Engineer.

2.10 AMOUNT OF WATER AND SLUMP TEST

A. The amount of water required for the proper consistency of concrete shall be determined by means of the Slump Test made in accordance with the Standard Method of Slump Test for Consistency of Portland Cement Concrete of the AASHO Serial Designation: T-1 19-42 with subsequent amendments.

B. The amount of slump shall be twelve inches (12”) minus the height after subsidence. The allowance for slump shall be as follows:
   1. Cast-in-place pipe and concrete paving - not more than three inches (3”).
   2. All concrete structures - not more than three inches (3”).
   3. Concrete curbs and gutters - not more than five inches (5”).

C. The amount of water used shall not exceed six and one-half gallons (6½ gal.) including moisture in the aggregate, per sack of cement for concrete with 590-lbs of cement, and seven gallons (7-gal.) per sack of cement for concrete with 505-lbs of cement.

2.11 PROTECTING CONCRETE

A. Concrete for structures shall not be placed on frozen ground nor shall it be mixed or placed while the atmospheric temperature is below thirty-five degrees Fahrenheit (35 °F), unless adequate means are employed to heat the aggregates and water, and satisfactory provisions have been made for protecting the work. Provisions satisfactory to the Engineer shall be taken to protect concrete about to be poured when there is danger of temperature dropping below thirty-five degrees Fahrenheit (35 °F) within the next twenty-four (24) hours. Concrete damaged by frost action shall be replaced at no additional cost to the OWNER. Concrete shall not be placed when the atmospheric temperature in the shade in the vicinity of the work exceeds ninety-five degrees Fahrenheit (95 °F), or when the temperature of the concrete exceeds eight-five degrees Fahrenheit (85 °F).

B. Structure concrete and shotcrete used as structure concrete shall be maintained at a temperature of not less than 45 °F for 72-hours after placing and at not less than 40 °F for an additional 4 days. When required by the Engineer, the Contractor shall submit a written outline of the proposed methods for protecting the concrete.

C. All surfaces against which concrete is to be placed shall be free from standing water, mud, debris, and shall be firm enough to prevent contamination of the concrete by earth or other foreign material.

D. Absorptive surfaces against which concrete is to be placed shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete.

2.12 FORMS

A. Forms shall be smooth, mortar tight, true to the required lines and grades, and of sufficient strength to resist springing out of shape during the placing of the concrete. All dirt, chips, sawdust, nails, and other foreign matter shall be completely removed from the forms before any concrete is deposited therein. Forms previously used shall be thoroughly cleaned of all dirt, mortar, and foreign matter before being reused. Before concrete is placed in forms, all surfaces against which the concrete will be placed shall be thoroughly coated with form oil.

B. Prior to placing concrete, check all forms checked for alignment and grade. Forms, reinforcing steel, or earth surfaces to receive concrete shall be wet prior to concrete placement.

2.13 CURING CONCRETE

A. When maximum daytime temperature exceeds fifty degrees Fahrenheit (50 °F) all newly placed concrete shall be sprayed uniformly with a curing compound. Curing compound shall be applied at a nominal rate of one gallon per one hundred fifty square feet (1 gal/150 ft^2), unless otherwise specified. Immediately after finishing, the exposed exterior surfaces of the concrete shall be cured by either the water method, pigmented curing compound method, or the waterproof membrane method, in accordance with Section 90-1.03B, “Curing Concrete” of the Caltrans Standard Specifications, except for cast-in-place concrete pipe for which only the waterproof membrane method shall be used.

2.14 VIBRATOR

A. Whenever a structure requiring reinforcement is to be constructed, provide one (1) or more portable vibrating machines to be used on such structures as directed by the Engineer. Full compensation for providing vibrating machines shall be considered as being included in the various bid items of work and no additional payment will be made therefore.

2.15 CEMENT MORTAR

A. Cement mortar shall be composed of one (1) part Portland Cement and two (2) parts of clean, well-graded sand of such a size that it will pass a number eight (#8) sieve. An admixture of hydrated lime, fire clay or diatomaceous earth may be used in the mortar to facilitate workability, and the amount of such material used will be limited as ordered by the Engineer. Quick setting cement may be used when necessary to facilitate the early backfilling of trench.

B. No mortar shall be used in which water has been added to the dry ingredients for a period of over thirty (30) minutes.

2.16 CEMENT REQUIREMENTS

A. Concrete compressive strength requirements shall be the minimum strength at the age of twenty-eight (28) days as required in these Standard Specifications for the items of work requiring Portland Cement Concrete. The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled and made in accordance with these Standard Specifications and with ASTM C31. Cylinders shall be tested in accordance with ASTM C39. Should the concrete used in the work fail to meet the minimum strength requirements as specified for the items of work, the Contractor shall, at his expense, make corrective changes in the material mix proportions or in the concrete fabrication procedures, before placing additional concrete.

B. In addition to the aforementioned requirements, all such concrete represented by test cylinders which indicate strength of less than the specified strength for the item of work will be rejected in accordance with the provisions of Section 6.04, “Defective Materials” of these Standard Specifications. Such rejection shall prevail unless the Contractor, at his expense, obtains and submits evidence of a type acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable, or undertakes remedial action to correct the deficiency in a manner acceptable to the Engineer.

PART 3 - EXECUTION

3.01 PREPARATION OF SUBGRADE

A. Excavate for and prepare the sub grade as specified in Section 31 23 00 - Earthwork, true to the indicated grade and cross section.

B. Test completed sub grade for correct grade and cross section by means of template supported on side forms.

C. Dampen sub grade and forms just before placing concrete.

3.02 TYPES OF CONSTRUCTION

A. Provide cast-in-place concrete construction, plain or reinforced as indicated. Curbs and gutters shall be formed accurately to indicate section profile with template screed.

B. Extruded curbs and gutter, placed by an extrusion machine, may be provided where site conditions are suitable and the extrusion process is appropriate for the purpose.

3.03 JOINTS

A. Expansion Joints:
1. Construct 3/8-inch to 1/2-inch thick expansion joints in the following locations:
   a. In curb and combination curb and gutter at the locations of expansion joints in the concrete roadway.
   b. In curb or combination curb and gutter, at points where curved and tangent sections join.
   c. Between curb or combination curb and gutter, and any drain inlet or similar structure occurring within the limits of the curb or combination curb and gutter.
   d. At corners in sidewalks, following the projections of the building lines from the corner of the building to the curb.
   e. Between sidewalks and any permanent structure.
   f. Between sidewalk and curb.
   g. Through sidewalks at intervals not greater than 15-feet.
   h. Construct expansion joints as specified in the construction plans, except that load transfer devices will not be required unless indicated. Shape preformed filler to cross section of curbs and combination curb and gutter.

B. Contraction Joints: In sidewalks, provide contraction joints as indicated in uniform intervals not greater than 6 feet, with the edges rounded to a 1/4-inch to 3/8-inch radius.

C. Tooling: Finish joints with an edging tool having 1/4-inch to 3/8-inch radius, leaving joints free of mortar and concrete. In preformed type joints, leave joint filler material exposed for full length of joint with clean and true edges.

D. Joint Sealing:
1. Seal to within 1/8-inch of pavement surface joints in curbs and gutters, including gutter surfaces of combination curb and gutter sections; all joints between curbs and vehicular pavement; all joints between gutters and vehicular pavement; and all other expansion joints.

2. Do not seal joints until concrete curing is complete. Prior to installation of the joint sealing compound, clean the joints of dirt and other foreign material. Joints may be cleaned with compressed air jets provided that the air in such jets is free of oil or water. Do not fill joints when there is any free water in or adjacent to the joints. Joint walls and all surfaces to which the sealing material is to adhere shall be surface dry for at least three hours prior to sealing.
3. Apply with approved pressurized equipment. Perform sealing of joints to make them impervious to water and to prevent the sealing compound from spreading over the surface of the pavement.

E. Form Removal:
1. Remove front curb forms not less than two or more than six hours after placing concrete, but in no case while the concrete is still plastic enough to slump.
2. Remove other forms not less than twelve hours after finishing is completed.

3.04 FINISHING

A. General:
1. Keep the curb face wet during above finishing operations.
2. Allow no coarse aggregate to show on the finished curb surface.

B. Curb and Combination Curb and Gutter:
1. Trowel the face of curb smooth to a depth of not less than 2-inches below the flow line, or to the flow line of integral curb and gutter, and finish with a steel trowel, all immediately after removal of front curb forms.
2. Finish all curb edges with a radius of 1/2-inch.
3. Provide a final fine brush finish to both top and face of curb with brush strokes parallel to the line of the curb, so that both top and front face present the same uniform appearance.

C. Sidewalks, Ramps and Driveways:
a. For pedestrian and wheelchair ramps, and all other surfaces where the Contract Drawings require a non-slip finish, provide a "nonslip finish" in combination with a "floated finish" or "broom finish" in accordance with the requirements of ACI 301.
b. Broom finish shall be applied perpendicular to the direction of traffic flow.
c. Finish all edges with a radius of ¼-inch to 3/8-inch.

3.05 CURING AND PROTECTION

A. Comply with the applicable requirements of the Caltrans' Standards, for curing concrete with liquid membrane-forming curing compound. Do not permit traffic on new concrete pavement until the concrete has cured a minimum period of ten days.

B. Provide damp curing only, in accordance with Caltrans' Standards, for concrete slab surfaces indicated to be treated with concrete hardener and dust proofer.

3.06 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform inspections and tests as specified in Caltrans' Standards for Portland Cement Concrete.

END OF SECTION

SECTION 32 17 23

SIGNING, STRIPING, AND PAVEMENT MARKINGS

PART 1 – GENERAL

1.01 SUMMARY

A. This work shall consist of furnishing and applying thermoplastic traffic stripes (traffic lines) and pavement markings, including glass beads, and furnishing and placing raised pavement markers at the locations and in accordance with the details shown on the Plans or designated by the Engineer, and as specified in these Specifications.

B. For the purposes of these Specifications, traffic stripes (traffic lines) are defined as longitudinal centerlines and lanelines which separate traffic lanes in the same or opposing direction of travel, and longitudinal edgelines which mark the edge of the traveled way or the edge of lanes. Pavement markings are defined as transverse markings which include, but are not limited to, word and symbol markings, limit lines (stoplines), crosswalk lines, shoulder markings, and parking stall markings. Pavement markers are raised pavement markers, reflectorized or non-reflectorized, of the type and color shown on the Plans and/or set forth in the Specifications.

PART 2 – PRODUCTS

2.01 SUBMITTALS

A. Paints shall be thermoplastic, designed for traffic use and shall conform to the latest revisions of Section 84-2 of the 2015 Caltrans Standard Specifications. Thermoplastic shall comply with State Specification PTH-02SPRAY, PTH-02HYDRO, or PTH-02ALKYD. Primer shall comply with manufacture's specifications. Do no thin the primer.

B. Raised pavement markers shall conform to Sections 81-3.02C of the 2015 Caltrans Standard Specifications. Adhesive for raised pavement markers shall conform to Subsection 81-3.02E "Epoxy Adhesive", of the Caltrans Standard Specifications, and as directed by the Engineer.

C. All traffic signs and the installation thereof shall conform to the current version of the Caltrans Standard Specification and the California MUTCD and the following:
   1. All sign faces shall consist of high intensity reflective sheeting, including anti-graffiti film coating (Coating 3M film, or equal). Aluminum plates 0.080 thickness.

D. All mounting hardware shall be vandal proof zinc coated, galvanized, or stainless steel. Aluminum will only be allowed for rivets. Banding shall be ½ inch wide stainless steel. Hose clamps are not permitted.

E. All posts for traffic signs shall be Telespar 2 inch square x 14 gauge galvanized steel, with holes punched on all four sides for the entire length of the post. All post anchor bases for traffic signs shall be Telespar 2-1/4 inch square x 12 gauge galvanized steel.

F. Directional arrows shall be Type IV (10') arrows in accordance with Caltrans Standard Plan RSP A24A.

PART 3 – EXECUTION

3.01 REMOVAL OF EXISTING MARKINGS

A. Where called for in the Plans and/or Specifications existing pavement striping, symbols, legend, and markings proposed for removal shall be removed by light grinding or other approved methods which will cause the least possible damage to the pavement. Alternate methods of removal required prior approval of the Engineer.

B. Where their removal is called for in the Plans and for Specifications, raised markers shall be removed by an approved method that will result in the least possible damage to the pavement. Where raised pavement markers are to remain, the Contractor shall take special care to protect existing reflective pavement markers and shall, at his expense, replace all coated markers.

C. All existing striping, stenciling or raised pavement markers, whether shown for removal or not, that will be in conflict with the intent of any new striping diagram, shall be removed. Removal shall be at the direction of the Engineer and no additional compensation will be allowed.

3.02 PLACEMENT OF THERMOPLASTIC STRIPES AND PAVEMENT MARKINGS

A. Preparation of surfaces and application of thermoplastic material shall conform to all requirements of Subsection 84-2.03 “Construction” of the Caltrans Standard Specifications, and these Specifications. Contractor shall wait 7-days after completion of paving operations prior to start of striping operations, or as directed by Owner’s Representative.

B. Word markings, letters, numerals, legends and symbols shall be applied utilizing suitable approved equipment together with approved stencils and templates. All markings shall be standard, and shall be identical with those used by the County of Tulare.

C. High visibility crosswalks shall straddle the wheels of vehicles to reduce tire to striping contact.

D. When no previously applied figures, markings, or traffic striping are available to serve as a guide, suitable layouts, such as "cat-tracking", shall be spotted in advance of the permanent application. Written approval of temporary layout shall be obtained prior to permanent application.

E. Where necessary, the Engineer will furnish the necessary control points for all required pavement striping and markings. Alignment and layout of the work by the Contractor shall conform to the Caltrans Standard Specifications. The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of the pavement striping and marking.

F. In areas of high traffic volume, the Contractor shall schedule work to apply traffic lines and markings in off-peak traffic hours, or on weekends.

G. The Contractor shall mark or otherwise delineate the traffic lanes in the new roadway or portion of roadway, or detour before opening it to traffic.

H. All markings and striping shall be protected from injury and damage of any kind while the material is drying. All adjacent surfaces shall be protected from disfiguration by spatter, splashes, spillage, and dripping of material.

I. The Contractor shall use proper and sufficient directional signs, warning devises, barricades, pedestals, lights, traffic cones, flagpersons, or such other devices to protect the work, workers and the public.

J. The Contractor shall contact residents, schools, and business owner's one week in advanced during lane closures. Construction warning signs shall be posted one week in advanced.

3.03 PLACEMENT OF SIGNAGE

A. Preparation and placement of signage shall conform to the requirements of the Caltrans Standard Specifications, the construction plans and these Specifications.

1. Traffic signs shall be installed at the locations, of the type, and at the height shown on the Plans, as specified in the Specifications, as directed by the Engineer, and in conformance with the current California MUTCD.

2. If a sign is to be installed in existing concrete, the concrete shall be cored with a 8-inch diameter hole with a 48" clear path for pedestrians measured from the face of the post to any other obstruction.

3. If a sign is to be placed where new concrete is to be poured, a post anchor base shall be provided in the new concrete. Solid embedment of sign posts in concrete is not permitted.

4. Sign posts shall be imbedded in the ground to the depth specified in the Plans, Contract Specifications, or California MUTCD as applicable. Any voids around sign posts passed through sleeves in concrete shall be backfilled with soil and thoroughly compacted to the satisfaction of the Engineer.

5. If the plans call out a new traffic sign post within 20 feet of an existing sign post, street light pole, or traffic signal pole, the Contractor shall call it to the attention of the Inspector. The Engineer shall determine if the traffic sign can be mounted on the existing post, street light pole, or traffic signal pole. Every effort shall be made to reduce the number of new traffic sign posts within the project limits. Signs mounted on street light poles or traffic signal poles shall be mounted with "Band-it Type" 3/4-inch stainless steel strapping material.

3.04 PLACEMENT OF RAISED PAVEMENT MARKERS

A. Preparation of surfaces and placement of raised pavement markers shall conform to the Caltrans Standard Specifications, and these Specifications.

B. The Contractor shall provide an experienced technician to supervise the application of the raised pavement markers.

C. Blue Pavement Markers (reflective) shall be furnished and placed in accordance with Section 82 of Caltrans Standard Specification. Blue Pavement Markers (reflective) shall be placed one (1) foot off the center of the street opposite fire hydrants.

3.05 SCHEDULE

A. In areas of high traffic volume, the Contractor shall schedule work to apply traffic markers in offpeak traffic hours, or on weekends.

B. All stripes and pavement markings shall be completely restored after the hot mix asphalt concrete (HMA) pavement is cured, using one coats of thermoplastic paint. The first coat will be applied after the asphalt concrete pavement is completely cured, which is estimated to be within 10 to 20 days after paving operations. Temporary markers shall be installed until permanent striping is completed. Prior to application of the first coat, and subject to County approval, the Contractor shall provide suitable means (such as temporary stripes, “tags”, or traffic cones and flashers) to direct and control traffic. Asphalt concrete pavement curing time shall not be included in the calendar days to complete the project, so long as no other work is being done within that time.

END OF SECTION

SECTION 43 51 13

NATURAL GAS PIPING

PART 1 – GENERAL

1.1 Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section includes natural gas service piping.

1.3 DEFINITIONS

A. Pipe sizes used in this Section are nominal pipe size (NPS) specified in English units.

B. Gas Main or Distribution Main: Piping to convey gas from gas source to individual gas services or other gas mains.

C. Gas Service: Pipe from gas main to compressor station to be served. Piping includes gas service piping and gas valve.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

Minimum Working Pressure Ratings: Except where otherwise indicated, the following are minimum pressure requirements for natural gas service piping.

A. Gas Service: 60 psi

1.5 SUBMITTALS

A. General: Submit the following according to the “Submittal” section of the Contract.

B. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" Article of this Section. Welders shall be qualified for welding gas pipelines.

C. Test reports specified in "Field Quality Control" Article in Part 3. At the Owner's option and expense, welds may be x-rayed to ensure compliance.

1.6 QUALITY ASSURANCE

A. Comply with requirements of utility supplying natural gas. Tapping of gas mains by Utility.

B. Comply with standards of authorities having jurisdiction for natural gas piping systems. Include materials, installation, and testing. Comply with applicable requirements of the California Plumbing Code, current edition.

C. Comply with NFPA 54 "National Fuel Gas Code" for gas piping materials and components; installations; and inspection, testing, and purging.

D. Provide listing/approval stamp, label, or other marking on material made to specified standards.

E. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."
   1. Comply with ASME B31 Series "Code for Pressure Piping."
   2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.

F. Product Options: Gas distribution systems specialties, valves, and accessories are based on specific types, manufacturers, and models indicated. Components having equal performance characteristics by other manufacturers may be considered, provided that deviations in dimensions, operation, and other characteristics do not change the design concept or intended performance as judged by the Engineer. The burden of proof of equality of products is on the Contractor. Refer to Division 1, "Substitutions."

1.7 DELIVERY, STORAGE AND HANDLING

A. Handling Flammable Liquids: Remove and legally dispose of liquids from drips in existing gas piping. Handle liquids cautiously to avoid spillage and ignition. Notify gas supplier. Handle flammable liquids used by Installer with proper precautions. Do not leave on the premises overnight.

B. Preparation for Transport: Prepare valves for shipping as follows:
   1. Ensure that valves are dry and internally protected against rust and corrosion.
   2. Protect valves against damage to threaded ends, flange faces, and weld ends.
   3. Set valves in the best position for handling. Set valves closed to prevent rattling.

C. Storage: Use the following precautions for valves during storage:
   1. Do not remove end protectors, unless necessary for inspection; then reinstall for storage.
   2. Protect valves from weather. Store valves indoors and maintain a temperature higher than ambient dew point temperature. Support valves off the ground or pavement in watertight enclosures when outdoor storage is necessary.

D. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent damage and entrance of dirt, debris, and moisture.

E. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when stored inside.

F. Protect flanges, fittings, and piping specialties from moisture and dirt.

1.8 PROJECT CONDITIONS

A. Perform site survey, research public utility records, and verify existing utility locations. Contact utility-locating service for area where Project is located.

B. Verify that natural gas distribution systems piping may be installed in compliance with original design and referenced standards.

C. Approximate values of natural gas assembly (MSA) that will be supplied for these systems are as follows:
   1. Specific Gravity: 0.6
   2. Estimated Minimum Outlet Pressure at Gas Meter Set Assembly (MSA): 29.5 psi at 1000 scfm
   3. Estimated Minimum Outlet Pressure at Gas Meter Set Assembly (MSA): 34.7 psi at 750 scfm
   4. Estimated Minimum Outlet Pressure at Gas Meter Set Assembly (MSA): 37.9 psi at 500 scfm
   5. Design Maximum Inlet Pressure at Gas Meter Set Assembly (MSA): 60 psi

1.9 SEQUENCING AND SCHEDULING

A. Final connection to the MSA will not be permitted without written authorization from the Engineer and until the natural gas station equipment is fully functional.

B. Coordinate connection to meter set assembly (MSA) with utility company and owner.

C. Coordinate with other utility work.

D. Notification of Interruption of Service: Notify Engineer a minimum of two working days in advance when gas supply will be turned off.

E. Work Interruptions: Leave natural gas distribution systems in a safe condition when interruptions in work occur while alterations or repairs are being made to existing gas piping systems.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Gas Valves, 2 inches and smaller:
      a. Homestead by Olson Technologies, Inc.
      b. Lancaster by National Meter Parts, Inc.
      c. Lunkenheimer Co.
      d. A.Y. McDonald Mfg. Co.
      e. Milliken Valve Co., Inc.
      f. Mueller Co., Grinnell Co.
      g. Mueller Steam Specialty Div., Core Industries, Inc.
      h. Nordstrum Valves, Inc.
      i. Resun by J.M. Huber Corp., Equipment Div.
      j. Rockford-Eclipse Div., Eclipse, Inc.
   2. Gas Valves, 2 ½ inches and Larger Gas Valves:
      a. Homestead by Olson Technologies, Inc.
      b. Milliken Valve Co., Inc.
      c. Mueller Steam Specialty Div., Core Industries, Inc.
      d. Nordstrum Valves, Inc.

e. Resun by J.M. Huber Corp., Equipment Div.
f. Xomox Corp.

2.2 PIPE

A. Refer to Part 3 "Piping Applications" Article for pipe materials required for each system.

B. Steel Pipe: ASTM A 53; Type E, Electric-Resistance Welded or Type S, Seamless; Grade B; Schedule 40; black.

2.3 PIPE FITTINGS

A. Refer to Part 3 "Piping Applications" Article for pipe-fitting materials required for each system.

B. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threads conforming to ASME B1.20.1.

C. Unions: ASME B16.39, Class 150, black malleable iron; female pattern; brass-to-iron seat; ground joint.

D. Cast-Iron Fittings: ASME B16.1, Class 250.

E. Steel Fittings: ASME B16.9, wrought-steel buttwelding type; and ASME B16.11, forged steel.

F. Steel Flanges and Flanged Fittings: ASME B16.5.

G. Transition Fittings: Type, material, and end connections to match piping being joined.

2.4 JOINING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for joining materials required for each system.

B. Welding-Joint Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe.

C. Threaded-Joint Compound and Tape: Suitable for natural gas.

D. Steel-Pipe, Flanged-Joint Gasket Material: Thickness, material, and type suitable for natural gas.

E. Steel-Pipe, Flanged-Joint Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.

2.5 GAS VALVES

A. Manual Valves: Conform to standards listed, or where appropriate, valves according to ANSI Z21.15 and ANSI Z21.15a are acceptable.

B. Gas Valves, 2 inches and Smaller: ASME B16.33, 150 psi WOG, bronze body, bronze plug, straightaway pattern, square head, tapered-plug type, and threaded ends.
1. Option: Include locking (tamper proof) feature.

C. Gas Valves, 2 inches and Smaller: ASME B16.33, 150 psi WOG, cast-iron body, bronze plug, straightaway pattern, square head, tapered-plug type, and threaded ends.

1. Option: Include (tamper proof) locking feature.

D. Gas Valves, 2 inches and Smaller: 150 psi WOG minimum, equivalent to ASME B16.33, lubricated, straightaway pattern, cast-iron or ductile-iron body. Include tapered plug, O-ring seals, square or flat head, and threaded ends.
   1. Option: Include locking (tamperproof) device feature.

E. Gas Valves, 2 inches and Smaller: 150 psi WOG minimum, equivalent to ASME B16.33, nonlubricated plug type with PTFE lining or sleeve, straightaway pattern, cast-iron body, square or flat head, and threaded ends.
   1. Option: Include (tamper proof) locking device feature.

F. Gas Valves, 2 ½ inches and Larger: MSS SP-78, Class 125 or 175 WOG, lubricated plug type, semisteel body, wrench operated, and flanged ends.
   1. Option: Include (tamper proof) locking device feature.

G. Gas Valves, 2 ½ inches and Larger: MSS SP-78, Class 125 or 175 WOG, nonlubricated plug type with PTFE lining or sleeve, semisteel body, wrench operated, and flanged ends.
   1. Option: Include (tamper proof) locking device feature.

H. Valve Boxes: Cast-iron 2-section box. Top section includes cover with "GAS" lettering. Bottom section includes base of size to fit over valve and barrel approximately 4 inches in diameter. Valve box includes adjustable cast-iron extension of length required for depth to bury valve.
   1. Furnish 1 steel operating wrench with each valve box. Include tee-handle with 1 pointed end, stem of length required to operate valve, and socket fitting valve-operating nut.

2.6 GAS PRESSURE REGULATOR

A. General: The new gas pressure regulator to serve the new skid mounted compressor system shall be installed between the meter set assembly (MSA), above finished grade, within the compressor pad area.

B. Design Conditions: The regulator shall be operational under the following minimum conditions:

   Temperature Capabilities: -20 to 180° F
   Inlet Pressure Range: 30-60 psig
   Outlet Control Pressure: 35 psig
   Minimum Flow: 240 scfm
   Maximum Flow: 1200 scfm

C. Regulator Manufacturers
   1. Fisher or approved equal

2.7 PIPING SPECIALTIES

A. Dielectric Fittings: Assembly or fitting having insulating material isolating joined metal piping to prevent galvanic action and stop corrosion.
   1. Description: Combination of copper alloy to ferrous or ferrous to ferrous; threaded and weld-neck end types and matching piping system materials.
   2. Insulating Material: Suitable for natural gas at system operating pressure and temperature.
   3. Dielectric Unions: Factory-fabricated union assembly, for 250 psi minimum working pressure at 180 deg F temperature.

4. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150 psi minimum pressure to suit system pressures.
5. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
   a. Provide separate companion flanges and steel bolts and nuts for 150 psi minimum working pressure.

2.8 PROTECTIVE COATING

A. Furnish pipe and fittings with factory-applied, corrosion-resistant, polyethylene coating for corrosive atmospheres. Coating properties include the following:
1. Applied to pipe and fittings treated with a compatible primer prior to tape application.
2. Overall Thickness: 20 mil
3. Adhesive: Synthetic
4. Water Vapor Transmission Rate: 0.15 gallons maximum per 24 hours per sq. foot
5. Water Absorption: 0.02 percent maximum

B. Field-Applied Coating: ASTM D 4397, polyethylene tape in number of layers and procedure required to provide properties equivalent to factory-applied coating above. At a minimum 35 mil, minimum thickness of Polyken tape (Polyken Technologies, 690 Canton Street, Massachusetts 02090) or XTRU coating to 50 mil, or equivalent.

2.8 IDENTIFICATION

A. Metallic-Lined Plastic Underground Warning Tapes: Polyethylene plastic tape with metallic core, 6 inches wide by 4 mil thick, solid yellow color with continuously printed caption in black letters "CAUTION - GAS LINE BURIED BELOW."

PART 3 – EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling is specified in Section 31 23 00 "Earthwork" and as shown on the Plans.

3.2 PREPARATION

A. Precautions: Close equipment shutoff valves before turning off gas to premises or piping section. Perform leakage test as specified in "Field Quality Control" Article to determine that each piece of gas-burning equipment is turned off in piping section affected.

B. Comply with NFPA 54 "Prevention of Accidental Ignition."

3.3 PIPING APPLICATIONS

A. Flanges, unions, transition and special fittings, and valves with pressure ratings the same or higher than system's pressure rating may be used in the following aboveground applications except where specified otherwise.

B. Aboveground Gas Service Piping: Use steel pipe, butt-welding-type fittings, and welded joints. Joints for connection to threaded regulators, meters, and valves may be threaded.

C. Underground Gas Distribution and Service Piping: Use steel pipe, steel pipe fittings, and welded joints, all coated in accordance with paragraph 2.7 above.

3.4 VALVE APPLICATIONS

A. Use gas valves of sizes indicated for gas service piping, meters, mains, and where indicated. All valves shall be full line size unless otherwise indicated.

3.5 JOINT CONSTRUCTION

A. Use materials suitable for natural gas service.

B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:
   1. Note the internal length of threads in fittings or valve ends and proximity of internal seat or wall to determine how far pipe should be threaded into joint.
   2. Apply tape or thread compound to external pipe threads.
   3. Align threads at point of assembly.
   4. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
   5. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

C. Welded Joints: Construct joints according to AWS D10.12 "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to "Quality Assurance" Article.

D. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

E. Piping Connections: Except as otherwise indicated, make piping connections as specified below.
   1. Install unions, in piping 2 inches and smaller, adjacent to each valve and at final connection to each piece of equipment having a 2 inches or smaller threaded pipe connection.
   2. Install flanges, in piping 2 ½ inches and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
   3. Install dielectric fittings to connect piping materials of dissimilar metals.
   4. Install dielectric fittings downstream of gas meters. Use the following type:
      a. Ferrous to Ferrous Type: When connected to steel gas system piping downstream of meter.
      b. Ferrous to Copper-Alloy Type: When connected to copper gas system piping downstream of meter.

3.6 PIPING INSTALLATIONS

A. Install buried gas service piping with a 24 inch minimum cover. Include underground warning tape.

B. Install unions in pipes 2 inches and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated. Unions are not required on flanged devices.

C. Install dielectric fittings (unions and flanges) with 1 ferrous and 1 brass or bronze end connection separated by insulating material where piping of dissimilar metals are joined.

D. Install dielectric fittings (unions and flanges) with 2 ferrous end connections separated by insulating material at outlet from gas meter, and where indicated, for ferrous piping.

E. Install flanges on valves, specialties, and equipment having 2 ½ inches and larger connections.

F. Install underground, plastic, gas distribution piping according to ASTM D 2774.

3.7 VALVE INSTALLATION

A. Install valves where indicated. Install buried valves with valve boxes.

B. Install valves in accessible locations, protected from physical damage. Tag valves with metal tag attached with metal chain indicating piping systems supplied.

C. Install specialty valves according to manufacturer's written instructions.

3.8 CONNECTIONS

A. Extend and connect natural gas distribution piping to gas source.
   1. Terminate gas service piping at compressor skid location until skid has been installed. Terminate piping with caps, plugs, or flanges, as required for piping material. Make connections to compressor skid gas systems when those systems are installed.

B. Connect to utility company meter set assembly (MSA) according to utility company's procedures and requirements following written authorization by Engineer.

C. Connect to existing gas main according to ASME B31.8.

3.9 ELECTRICAL BONDING AND GROUNDING

A. Install aboveground portions of natural gas piping systems that are upstream from equipment shutoff valves, electrically continuous, and bonded to grounding electrode according to NFPA 70.

B. Do not use gas piping as a grounding electrode.

3.10 LABELING AND IDENTIFYING

A. Install continuous, plastic, underground warning tape during back-filling of trench for underground gas piping. Locate as shown on the drawings.

3.11 PAINTING AND FINISHING

A. Use materials and procedures specified for "Exterior Ferrous Metal" painting with "Full-Gloss Alkyd Enamel." Color is gray except where indicated otherwise. Refer to Section 09 91 13 ”Exterior Painting.”

B. Paint exposed metal pipe, fittings, valves, and supports.

C. Paint exposed metal meters, regulators, specialties, accessories, and supports, except units with factory-applied paint or protective coating. Restore damaged finish to original condition.

3.12 FIELD QUALITY CONTROL

A. Inspect, test, and purge natural gas systems according to NFPA 54, Part 4 "Gas Piping Inspection, Testing, and Purging" and local gas utility company requirements. Test in accordance with the requirements of the California Plumbing Code (current edition) at a pressure not less than 75 psig for a duration not less than 30 minutes.

B. Repair leaks and defects with new materials and retest system until satisfactory results are obtained.

C. Report test results promptly in writing to the Engineer and the authorities having jurisdiction.

D. Verify capacities and pressure ratings of gas valves, and specialties.

E. Verify that specified piping tests are complete.

3.13 ADJUSTING

A. Adjust controls and safety devices. Replace damaged and malfunctioning controls and safety devices.

END OF SECTION

SECTION 43 80 00

COMPRESSED NATURAL GAS FUELING STATION EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish and install:

A. One (1) complete compressed natural gas (CNG) time-fill Fueling Station for vehicle fueling. Major components of the system include:
   1. Single tower, manual regeneration, skid mounted inlet gas dryer, including pre-filter and post filters, with automatic dew point monitor.
   2. Skid mounted compressor system, including electric motor; compressor; inter/after stage coolers; oil and condensate removers; suction and discharge pulsation dampers; gas recovery tank; sound attenuated enclosure; and filters. Phase 1 to include two 240 scfm minimum compressors and 125-horsepower motor on a dual skid. Phase 2 to include identical dual skid.
   3. Twelve (12) dual hose time-fill dispensers in Phase 1. Six (6) dual hose and two (2) single hose time-fill dispensers in Phase 2.
   4. All associated instruments, valves, controls, piping and hoses.
   5. Emergency shut down (ESD) system.
   6. Fire extinguishers as noted on the plans.
   7. Combination priority/time-fill panel, including Coriolis mass flow meter.

B. Contractor furnished design services required to ensure compatible sizing and selection of all auxiliary compressor system components including: coolers, tanks, filters and dryers. System component selection by the Contractor shall be based on a compressor system gas delivery requirement of at least 460 standard cubic feet per minute (SCFM) with a suction inlet at 30 psig and a discharge of 4500 psig.

C. All components, appurtenances, materials, labor, shop testing and field testing as required to provide a complete and operational compressed natural gas system as shown on the plans and as specified herein.

1.02 EQUIPMENT NUMBERS

Not Used

1.03 RELATED SECTIONS

A. The “Submittals” section of the Contract.

1.04 REFERENCE STANDARDS

A. ASME - Boiler and Pressure Vessel Code

B. ASME/ANSI B31.3 - Chemical Plant and Petroleum Refinery Piping

C. ASME B16.3 - Malleable Iron Threaded Fittings

D. ASME B16.18 - Cast Bronze Solar-joining Pressure Fittings

E. ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings

F. ASME B16.26 - Cast Bronze Fittings for Flared Copper Tubes

G. ASME B31.1 - Power Piping

H. ASME B31.9 - Building Services Piping

I. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless

J. ASTM A120 - Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized), Welded and Seamless, for Ordinary Uses

K. ASTM A234 - Pipe fittings of wrought carbon steel and alloy steel for moderate and elevated temperatures

L. ASTM B32 - Solder metal

M. ASTM B88 - Seamless copper water tube

N. ASTM D2513 - Thermoplastic gas pressure pipe, tubing and fittings

O. ASTM D2683 - Socket-type polyethylene fillings for outside diameter-controlled polyethylene pipe

P. NFPA 70 - National electrical code

Q. NFPA 52 - Compressed Natural Gas (CNG) vehicular fuel systems

R. American Welding Society (AWS)

S. UFC (Uniform Fire Code) latest edition

T. American Gas Association (AGA)

U. Compressed Gas Association (CGA)

V. Occupational Safety and Health Administration (OSHA)

W. Underwriters Laboratories (UL)

X. Society of Automotive Engineers (SAE)

Y. SAE-J1616-Gas Quality Standards Certificate of Compliance Required

1.05 SYSTEM DESCRIPTION

A. The CNG system shall be capable of compressing at least 480 standard cubic feet per minute per compressor of natural gas (Compressor suction inlet of 30 psi - Discharge pressure of 4500 psig) taken from the Gas Company metered source at a minimum 42.9 psig (inlet at MSA) pressure to a discharge pressure adjustable up to 5,000 psig. In this configuration, the meter set assembly (MSA) outlet pressure may vary from 34.7 – 60 psig, regulated to 35 psig ahead of the dryer.

B. Natural Gas

Gas Inlet Pressure:	34.7-60 psig - Pressure delivered to site by the Gas Company is regulated to 35 psig. The assumed suction inlet after losses through piping and drier are 30 psig.
Ambient Air Temp:	10-120°F (in the shade)

C. Electric Service

1. Electrical power supplied to the compressor motor will be 480V three-phase, 60 hertz.
2. Electrical power supplied to other systems will be 120 VAC, single-phase, 60 hertz.
3. Contractor to reference electrical drawings and specifications for main service feed information.

1.06 SUBMITTALS

A. In accordance with the “Submittals” section of the Contract.

B. Submit complete plans, specifications, catalog information and cuts, descriptive drawings and literature for each equipment item to be furnished under this Section. All exceptions to the specifications shall be noted.

C. Submittals shall include manufacturer's installation drawings for approval by the Engineer.

D. Submit dimensioned plans showing the skid mounted system layout with all major system components clearly identified and keyed to the items furnished in Paragraph "B" above. Actual components to be used shall be identified by manufacturer's name and model number on the shop drawings. The plans shall include operating parameters of each major equipment item including flow rates, pressures and pipe sizes. The shop drawings shall show locations of all major instrumentation and control components.

The shop drawings shall also show locations of all pipe supports, method of attachment of major components to their mounting skid, all seismic bracing details, details of welded connections, pipe joint details and skid construction details.

The following system components shall be included and identified in the Contractor's plans.

1. Prefilter
2. Dryer
3. Postfiler
4. Compressor and its electric motor
5. Intercooler and aftercooler
6. Oil and condensate remover
7. Gas recovery tank.
8. Dispensing system including anchorage
9. Instruments
10. Pressure and temperature gauges
11. Meter
12. Fire, check, pressure relief ball valves
13. Tubing
14. Process piping diagram

E. Calculations: Submit calculations and/or manufacturer's data to substantiate the Contractor's selection of the system components listed.

Such documentation shall demonstrate the adequacy of these components to provide overall system performance as required by these Specifications.

Calculations and supporting documentation shall be signed and stamped by a Mechanical Engineer currently registered in the State of California.

F. The Contractor shall provide with his/her submittals, a manufacturer's suggested list of spare parts for all equipment furnished under this Section. Such list shall include all spare parts, which the manufacturer(s) expect to be required for maintenance/replacement purposes during the first two (2) years of equipment operation. The list shall include part numbers, part description and current pricing. Prices are to be valid for a period of one (1) year following the date of system commissioning.

G. The Contractor shall provide six (6) copies of complete written field testing procedures for review and approval by the Owner at least three weeks in advance of such field testing. Comply with the “Submittals” section of the Contract. Owner to witness field testing.

H. Provide manufacturer's certification of satisfactory shop performance.

I. Submit Owner personnel training schedule and outline of topics to be covered in training sessions.

J. Submit equipment mounting dimensions for installation of cast-in-place anchor bolts.

K. Submit manufacturer's recommendations for painting and coating of equipment and piping.

L. Submit outline of O&M Manual format and contents.

M. Submit welding procedures per American Welding Society format.

N. Seismic calculations for skid-mounted equipment, all process piping and attachment of the skid to its concrete base. Also provide centers of gravity and weights for independent verification of calculations by Owner.

1.07 QUALITY ASSURANCE

A. Single Source Responsibility: The system specified herein shall be furnished by a single packager regularly engaged in the production of compressed natural gas delivery systems and associated control components. The responsibility for performance in compliance with this specification in its entirety shall not be divided among individual suppliers of components comprising the system, but shall be assumed solely by the packager of the compressed natural gas system.

B. Compressed Natural Gas System Packager’s Qualifications: The Contractor shall pre-qualify all potential packagers of the compressed natural gas systems and shall not submit such systems for approval unless the following conditions have been met:

1. The manufacturer/packager of the compressed natural gas system shall have been regularly engaged in the manufacturer of such systems for at least five (5) years and have at least five (5) installations similar to those specified herein in active service. Such installations shall have been in satisfactory service for at least three (3) years and their application shall be in the delivery of compressed natural gas fueling systems for automotive applications. Approval of the proposed packager of the compressed natural gas system shall be contingent upon satisfactory verification by the Engineer of prior installations.

C. The compressed natural gas system control panel and skid components shall carry a U.L. label (or other approved third party listing) for its intended purpose under these Specifications. All system components shall comply in all respects with NFPA 52 - Compressed Natural Gas (CNG) Vehicular Fuel Systems.

1.08 WARRANTY

A. The Contractor shall furnish a one (1) year warranty for all work covered by this Section for material and workmanship. The warranty shall cover full cost of labor and material to repair or replace any faulty installation. The warranty shall be subject to approval by the Engineer and shall be provided prior to project completion.

1.09 MANUFACTURER'S SERVICES

A. The Contractor shall provide a manufacturer's representative for the equipment specified herein to be present at the jobsite and/or classroom designated by the Engineer for the minimum man-days listed for the services below, travel time excluded:
   1. One man-day for installation assistance, inspection and certification of the installation (includes Contractor inspection of field installed underground piping prior to backfill).
   2. Two man-days for pre-startup classroom and jobsite training for Owner personnel.

B. The training for Owner personnel shall cover the following topics:
   1. Routine operation and maintenance of all compressed natural gas fueling station components.
   2. Daily and weekly inspections (maintenance checklist forms shall be provided by the Contractor).
   3. Long-term maintenance and service requirements.
   4. Safety procedures.
   5. Emergency procedures.
   6. Emergency fueling support.
   7. System operation overview.
   8. Trouble shooting procedures.

C. An authorized representative of the compressed natural gas system supplier as described in paragraph 1.7, A. of this Section, shall inspect the installation of all work furnished under this Section and shall provide a certificate of satisfactory installation.

D. The Owner shall receive a one thousand dollars ($1,000.00) per day credit from the Contractor for any training that is not conducted in accordance with the requirements of Paragraph A above. The Contractor and the Owner will jointly verify that the required training is conducted.

PART 2 - PRODUCTS

2.01 NATURAL GAS DRYER

A. General: This specification covers the minimum requirements for a single tower gas drier skid used to dry natural gas before it is compressed into CNG. The skid shall include a coalescing prefilter, natural gas drier, particulate filter with all instrumentation hardware and enclosures needed for a operational system as described herein.

B. Design Conditions: The natural gas drier skid shall be compatible with the compressor skid and shall be operational under the following minimum conditions:

Inlet Gas Flow rate:	720 SCFM* (minimum)
Inlet Gas Flow rate:	960 SCFM* (maximum)
Maximum Inlet Gas Pressure:	60 PSIG
Inlet Gas Temperature:	60-80°F
Inlet Gas Water Content:	7 LBS H_20/MMSCF
Ambient Temperature (min):	10°F
Ambient Temperature (max):	120°F
Vessel Design Temperature:	-20°F to 500°F
Maximum Outlet Gas Water content:	0.5 LBS H_20/MMSCF
Outlet Gas Dew Point:	-80°F
Duty Cycle:	12 HRS/DAY
Time Between Regenerations (720 SCFM):	300 HRS

* *Inlet gas flow rate for the dryer shall match the design inlet gas flow rate of all compressors, including future, running simultaneously and shall not be less than 960 SCFM.*

C. Components:

1. A coalescing prefilter shall be located at the inlet to the dryer. The filter cartridge shall remove 99.99% of particles 0.01 microns and larger and 99.9% of aerosols 0.1 microns and larger.
   a. The filter housing shall be carbon steel bowl/aluminum head style vessel. The filter shall be fitted with a drain port for removal of collected liquids. The filter cartridge shall be sealed to the housing.
   b. The drain port shall be fitted with a manual drain valve.
   c. The prefilter shall be designed and installed to allow replacement of the cartridge filter element without removing the housing from the piping system.
   d. The prefilter shall be furnished with two (2) inlet/outlet isolation ball valves.
2. The natural gas dryer shall be insulated single tower, heat regenerative, closed loop type using molecular sieve desiccant. Gas shall not be exhausted to the atmosphere under normal operating conditions. Regeneration shall be with a volume of gas, which is circulated through the regeneration system. The regeneration gas flow shall be co-current to the adsorption flow to prevent any dew point spike on switchover.
   a. The desiccant tower shall be an ASME U-stamped carbon steel vessel with a 1/16" corrosion allowance.
   b. The tower shall be furnished with a chamber pressure gauge.
   c. Stainless steel desiccant support screen and inlet diffuser shall be installed.
   d. Desiccant shall be molecular sieve for minimal co-absorption of mercapton.
3. Regeneration of the desiccant shall be accomplished on skid equipment using natural gas. Operator attended regeneration shall be manually initiated by a panel mounted push button once the manual isolation valves are correctly positioned. The regeneration time shall be approximately six (6) hours. Regeneration shall be manually initiated based on the dryer outlet dew point. Once initiated, regeneration shall proceed automatically to conclusion.

a. The gas blower shall be a positive displacement type with an electric motor rated in accordance with NFPA 52. Blower/motor shall be installed in an ASME “U” or “UM” stamped carbon steel pressure vessel with the same pressure and temperature rating as the dryer vessel.

b. The gas heater shall use incoloy sheathed, low watt density electric heating elements mounted inside an insulated heating chamber. An outlet temperature gauge shall be furnished. The heater vessel shall be an ASME “U” or “UM” stamped carbon steel pressure vessel with the same pressure and temperature rating as the dryer vessel.

c. An air to gas fin tube aftercooler complete with electric motor and non-sparking fan blades with motor in compliance to Class I, Div. II, Group D electrical class shall be provided.

d. A high efficiency coalescer-separator, ASME “U” or “UM” stamped pressure vessel carbon steel/aluminum construction shall be provided complete with an integral stainless steel reservoir complete with a manual drain valve. The reservoir shall have a liquid capacity to at least (2) regeneration cycles.

e. Regeneration shall be controlled by preset electronic timers for the heating and cooling cycles.

f. Two (2) manual inlet and outlet regeneration isolation valves shall be provided. The outlet regeneration valve shall be a lockable ball type bronze body with chromium plated ball and stainless steel trim rated for gas service with screwed ends. The inlet regeneration valve shall be a lockable high temperature rated gate valve with socket weld ends and lockable handle.

g. Four (4) filter inlet and outlet isolation valves shall be provided at the filters. Valves shall be lockable ball type bronze body with chromium plated ball and stainless steel trim rated for gas service with threaded ends.

4. Fiberglass insulation with aluminum cladding shall be installed on the desiccant tower heater housing and hot gas piping to prevent accidental physical contact with any hot surfaces. Insulation shall be suitable for outdoor service.

5. Heavy duty structural steel open frame skid shall be provided with four (4) lifting eyes for handling during installation.

6. A precision dew point monitor AUTODEW with digital dew point indication in degrees C, F, PPMV or LBS H_20/MMSCF shall be installed at the dryer control panel. The moisture sensor shall be installed at the dryer outlet to verify the gas dew point on a continuous basis. Two alarm lights shall be provided, the first to signal deteriorating dew point performance and finally when regeneration is required. A set of form “C” dry contacts shall be provided for remote signal. Dryer shall be sized according to standard 7 LBS H_20/MMSCF and shall be capable of performing during short periods where moisture increases to 12 LBS H_20/MMSCF.

7. Electrical construction shall be in accordance with NFPA 70 for Class I, Div. II, Group D. Electrical service is 460/230 VAC, 3 Phase and 120 VAC, 1 Phase. Terminal strips shall be furnished with all internal wiring complete to these terminals strips. Wires and terminal strips shall be labeled. The natural gas dryer shall be furnished with a grounding connection.

8. A particulate after filter shall be located at the outlet of this dryer. The filter cartridge shall remove 100% of particles 0.9 microns and larger.

   a. The filter housing shall be a carbon steel bowl/aluminum head style vessel. The filter shall be fitted with a vent port and vent valve. The filter cartridge shall be sealed to the housing.

b. The after filter shall be designed and installed to allow replacement of the cartridge filter element without removing the housing from the piping system.

c. The after filter shall be furnished with two (2) inlet/outlet isolation ball valves.

9. Bypass: Dryer shall have a bypass system so that when dryer is out of commission, the station will remain operational. Bypass shall be manually operated with isolation valves.

D. Instrumentation and Controls: The following instruments and controls shall be provided as a minimum:

1. 2 1/2" dial locally mounted desiccant chamber pressure gauge
2. 3" dial heater outlet temperature indicator
3. 3" dial aftercooler inlet temperature indicator
4. 3" dial aftercooler outlet temperature indicator
5. Waterproof NEMA 7 electrical control panel suitable for Class I, Division II, Group D, area
6. Dryer outlet dew point meter
7. Power On-Off switch
8. Regeneration START/STOP push buttons
9. Single input voltage connected at the control panel mounted at the dryer
10. Control voltage shall be 120VAC/1 Phase/60 Hz provided by a step down transformer
11. Operator attended regeneration shall be manually initiated by a panel mounted push button once the manual isolation valves are correctly positioned. The regeneration time shall be approximately six (6) hours.
12. Desiccant chamber ASME Code pressure relief valve set at 155 psig. Carbon steel body with threaded female outlet mounted with lockable bronze isolation ball valve.
13. Prefilter and after filter differential pressure gauges locally mounted to the filter head. Range 0-25 psig shall be provided.
14. High heater sheath overtemperature alarm and shutdown.
15. High after cooler outlet temperature alarm and shutdown.

E. Skid:

1. Manufacturer/Packager shall furnish all piping systems for all equipment mounted on the skid. Piping shall terminate at skid edge with flanged or threaded connections. Connections shall be sealed for shipment.

a. Pipe shall be carbon steel, SA53, Grade B, with wall thickness as required to meet the design conditions. Minimum schedule 40 for 2" and under.

b. Fittings for 2" and under, shall be threaded malleable iron, Class 150, ASTM A-197. Fittings larger than 2" shall be butt weld, ASTM A234 WPB, of the same wall thickness as the adjoining pipe.

c. Stud bolts shall be alloy steel, ASTM A-193, Grade B7, with two (2) heavy hex nuts, ASTM A-194, Grade 2H.

d. Flanges shall be forged steel, raised face, ASTM A-105, bored to match the I.D. of the pipe. Flange ratings, shall be as required for the design requirements of the piping systems. Optional socket welded piping 2" and under shall be quoted.

2. All welding and welder qualification shall conform to the requirements of the ASME Boiler and Pressure Vessel Code or API Standard 1104. All filter metals shall be in accordance with AWS or ASTM Standards.

3. All electrical systems for all electrical equipment shall be furnished and installed on the skid or to remote power and control panel (see plans).
4. Skid, equipment, piping and all other materials, which are not insulated, shall be painted with one prime and two finish coats. Equipment, which is received by the manufacturer with a shop primer, shall be touched up if defective before finish coats. Surface preparation and paint application shall be in accordance with manufacturers instructions. Paint shall be manufacturer's standard type and color. Refer to Section 09 9113 "Exterior Painting."

F. Testing and Documentation:
1. Each natural gas dryer shall be furnished with clear and concise printed instructions and diagrams adequate for field installation, maintenance and operation.
2. After thorough inspection and purging, all piping and tubing shall be tested at operating pressure. Dryer shall be tested under simulated operating conditions under pressure and certified prior to shipment.
3. The manufacturer shall conduct a complete system check-out, start-up, adjustment and training at the site. This shall include complete pneumatic and electrical checkout and calibration of all control devices and accessories. See Part 1, Paragraph 1.9, "Manufacturer's Services of these specifications.

G. Gas Dryer Manufacturers:
1. PSB NG-SR-15-4 DDP or equivalent

2.02 COMPRESSOR SYSTEM

A. Equipment and System Design and Performance Criteria
1. Compressor. System is for dual compressor skid. Requirements for each compressor are listed below.
a. Minimum output 240 SCFM at 30 psi suction pressure and 4500 discharge pressure. Discharge pressure adjustable up to 5000 psi.
b. Air cooled, two through four-stage single or double acting, lubricated, balanced horizontally opposed or radial, reciprocating compressor. Compressors shall be rated for continuous operation.
c. The compressors shall be driven by electric motors and shall be specifically designed to compress natural gas. No converted air compressors or used compressors shall be permitted.
d. Compressors shall be provided with either drive-belt or direct drive assemblies.
e. All drive assemblies shall include adjustable motor mountings and shall have suitable guards on all moving parts per OSHA requirements.
f. Gas shall be cooled after each stage of compression by means of intra/after coolers. Temperature of discharge gas shall not exceed ambient temperature by more than 20 degrees Fahrenheit. Interstage natural gas temperatures at any point in the compressor equipment shall not exceed 325 degrees Fahrenheit.
g. Safety devices shall include self-resetting pressure relief devices at appropriate pressures for each stage of compression and for the captive tank.
h. Compressors and motors shall be noise attenuated so as not to exceed 79 dba 3 meters from the compressor skid.
i. Minimum piston ring service life shall be guaranteed at 4,000 hours.

2. Electric Motor
   a. Compressors shall be driven by explosion proof electric motors design rated for continuous duty and high ambient temperatures.
   b. Belt drive, if used, shall be warranted for minimum service life of 20,000 operational hours.
   c. The motors shall be equipped with controls to allow automatic starting, warm-up, cool down and shutdown at pressures and times selectable by the station operator.
   d. The motors shall be equipped with safety devices to initiate automatic shutdown in the event of low oil pressure, high coolant temperature, high or low induction pressure, high compressor discharge pressure, high compressor discharge temperature, overspeed and overcrank.
   e. One motor must be able to start using the available backup generator, which is Caterpillar model #XQ200 portable diesel standby generator set, rated 200Kw, WITH FAN, 60 Hz, 3 Phase, 208-480V at 1800 RPM. Contractor shall verify that this generator with soft starter will start the selected 125-hp motor in the case when no other power is available to the site.
3. Oil and Condensates Remover (Separator)
   a. Each stage is to be equipped with a knockout, mesh pad, vortex or coalescing separator to remove oil and condensates. This separator is to be mounted after each cooler. Piping and coolers should be oriented to be self draining to the separators. Residual gas is to be automatically drained on compressor shutdown to a vapor recovery tank (reference to Section 4 below). All separators are to be flushed on shutdown of the compressor.
   b. Condensates and oil to be 98% (minimum) removed prior to gas being discharged.
   c. Each cooling stage shall have a cooler that conforms to ASME, Section VIII, Division I. All heat exchangers are to be oversized a minimum of 10% to compensate for fouling and damaged passes (requiring plugs). Heat exchangers shall be made with non-corrosive materials.
   d. Coolers shall be air-cooled, electric motor driven. Fan(s) shall be aluminum or plastic composite construction and shall be driven either by the compressor's motor direct drive assembly or by a separate direct driven fan.
4. Gas Recovery Tank
   a. The gas recovery system shall be designed to take the compressor blowdown gas and store the gas in a captive gas recovery tank for re-compression upon the next startup of the compressor.
   b. The tank shall be ASME rated and have the necessary capacity and working pressure to store the blowdown gas without relieving gas to the atmosphere or to the station suction line. The tank shall have full capacity relief protection.
5. System
   a. Interstage coolers, piping, separators and appurtenances must be designed for a minimum of 20% or 30 psi (whichever is greater) above the interstage discharge pressure at maximum suction pressure and 5,000 psig discharge pressure.
   b. Final discharge cooler, piping, separators and appurtenances must be designed for a minimum of 5,200 psig and equipped with an ASME "UV" stamped safety relief valve set and sealed at 5,000 psig.

c. Each stage must be equipped with an ASME "UV" stamped relief valve set and sealed at the interstage design pressure.

d. First stage suction and discharge at each stage is to be equipped with a locally mounted pressure gauge and transducer with a remote LCD pressure readout.

e. First stage suction and discharge at each stage is to be equipped with a locally mounted temperature thermocouple with a remote LCD temperature readout.

f. All guards including fan and belt guards are to be included and are to be of a spark-proof construction.

g. Gas vented during the unloading cycle shall be captured in the gas recovery tank (Section 4 above) and cycled back to the compressor suction on the next start-up.

h. A local control system and instrumentation panel shall be furnished for the compressor.

i. All controls and instrumentation shall comply with the NEC code requirements for class I, Division 2, Group D, and weatherproof or classified intrinsically safe and weatherproof.

j. All pressure gauges and dial thermometers shall be stainless steel. No sensing element containing brass or copper shall be permitted. Pressure gauges shall be oil filled and have rear blowout protection.

k. Each compressor shall have, as a minimum, the following control devices and indicators. Contractor shall furnish and install additional instrumentation as recommended by the compressor's manufacturers.

1) High/Low suction gas pressure shutdown
2) Interstage high discharge pressure shutdown
3) Final discharge pressure; high shutdown
4) Low crankcase oil pressure shutdown
5) Low crankcase oil level shutdown
6) High last stage discharge temperature
7) Emergency shutdown (ESD) as per NFPA 52
8) Excessive vibration shutdown switch
9) Hour meter
10) Key lock-out
11) Compressor automatic start cycle failure
12) Manual shutdown
13) Lights to indicate main power is energized, compressor running or standby
14) Common alarm contact for remote annunciation

l. In addition, a common termination point must be provided for the connection of remote shutdown switches, 120 VAC remote annunciation of shutdown alarm, and other filed wiring connections.

m. The Contractor shall provide and install an emergency shutdown switch near the compressor. The ESD switch will shut down the compressor and shut off flow to the dispensers.

n. Compressor skid control system shall be able to receive inhibit signal from the manual transfer switch to limit the system to running only one compressor when transfer switch is switched to the backup generator.

B. Sound Attenuation Enclosure

1. Summary: Furnish and install a weatherproof sound attenuation compressor enclosure for the compressor skid and ancillary equipment as herein described.
2. Submittals: In accordance with the “Submittals” section of the Contract. Submittals shall include at a minimum, dimensioned, shop drawings of the enclosure, engineered calculations in conformance with the California Building Code, detailed specifications of all accessories described herein. Contractor shall also submit paint color scheme for approval by the Engineer prior to application.
3. Warranty: Ten (10) years against rust, corrosion and perforations.
4. Design: The design of the compressor enclosure skid shall include the following features all on one skid.
    a. Totally enclosed and weather-proof compressor room.
    b. Cooler and ASME blow down receiver tank compartment.
    c. Methane detection system.
    d. Minimum of three (3) access doors (double door) for operation and maintenance
    e. removable panels or additional access doors for full access to all items of equipment. Process panels shall be removable with cam activated locks.
    f. Class A fire rating.
    g. Roof shall be sloped for drainage.
5. Sound Attenuation: All walls and roof of the compressor room are to be lined with flame resistant sound attenuating foam insulation material. The compressor enclosure shall be designed to minimize equipment noise levels to a maximum of 79 dBA @ 20' outside any enclosure wall.
6. Materials: The compressor enclosure is to be of welded steel construction. Wall and roof material shall be 14 gauge roll formed steel for rigidity.
7. Vent Fan: an explosion proof (Class 1, Division 1, Group D) and thermostatically controlled ventilation fan shall be provided inside the compressor room to exchange room air as necessary to limit maximum room temperatures to 15 degrees above ambient during compressor operation. The vent fan assembly shall be complete with venturi and an automatic louver. Other louvers are to be provided in the compressor room walls as necessary to assure adequate ventilating air flow.
8. Lights: At least two (2) explosion proof (Class 1, Division 1, Group D) 150W ceiling lights shall be provided, complete with an explosion proof wall mounted manual light switch.
9. Heater: an explosion proof (Class 1, Division 1, Group D) forced air heater and thermostat shall be provided and sized in accordance with the operating environment and customer requirements. Free convection resistance type heaters are not permissible.
10. Paint:
    a. All metal surfaces shall be hot-dipped galvanized prior to painting as described herein.
    b. General: Submit color choices for approval by Engineer prior to furnishing.
    c. In accordance with Section 09 91 13 "Exterior Painting" and as specified herein.
    d. Before painting, metallic surfaces are to be cleaned and free of mill scale, burrs and sharp edges. Painting shall be factory applied heat treated after application and comply with the following requirements:

        One coat anti-corrosion, abrasion resistant industrial primer - 1 mil dry film thickness.

One coat impact resistant, weather resistant high quality gloss enamel - of siliconized polyester for insulation, 1 mil dry film thickness per coat.

e. Field coating in accordance with Section 09 91 13 "Exterior Painting" may be required by the Engineer, to comply with color requirements by the Owner or as needed for repair to damaged or exposed areas.

C. Manufacturers
1. Only manufacturers names are listed. Contractor shall provide models meeting required design and performance criteria.
2. Compressor: IMW 604.795.9491; Ariel 740.397.0311; Greenfield, Inc. 972.889.2400; Gemini, 972.488.8725; Knox Western (lubricated) 814.459.2754; Angi 608.868.4626; Bauer 757.855.6006.
3. Electric Motors; GE; Westinghouse; Marathon.

2.03 DISPENSING SYSTEM

A. Time-Fill Dispensers
1. Furnish and install dual hose time-fill posts consisting of conductive hoses, retractors, break-away towers, fueling nozzles, connectors, vent valves and all fittings for a complete working system as shown on the plans. All work to conform to NFPA 52 and local fire code requirements.
2. Nozzles shall be Snap-Tite NGV-1 vented back to atmosphere or approved equal as shown on the plans.
3. The fill post body shall have a 5,000 psi gauge and a manual shut-off valve installed in the face of the body.
4. The fill post shall have the NFPA required signs painted on the face of the body.
5. Post assembly shall be a Fasttech Model FT-TFP-02-PM dual hose caisson mount fill post or approved equal.

B. Hose
1. 5,000 psig operating pressure and 20,000 psig burst pressure rated.
2. Rated for CNG use and marked or tagged “For CNG Use."
3. Min. 35' long electrically conductive hose for each dispensing nozzle. Protective coil to prevent abrasion to be provided over hose.
4. Hose must be equipped with an NGV1 fueling nozzle (vented to atmosphere), a stainless-steel breakaway connection to limit longitudinal hose tension to 44 lbs, a hose retractor (with breakaway capability).
5. Hose material: PTFE with stainless steel reinforcement.

C. Controls
1. Priority/Time-Fill panel shall be installed to direct compressed natural gas to the time fill dispensers as well as capacity to direct to the future three (3) bank cascading system as follows:
a. Sequencing of fill through dispenser shall be drawn from low bank, mid bank, and high bank, respectively. In the event that the high bank storage is inadequate to complete a fill, the compressor output shall be routed directly to the dispenser.
b. Each fast fill hose shall be independently sequenced so as to optimize filling of two vehicles of differing tank pressures. Sequencing valves shall be electronically operated.

c. Fill pressure shall be electronically temperature compensated to achieve a settled tank pressure of 3,600 psi at 70 degrees F, except that fill pressure shall not exceed 4,500 psi at any time.

d. Priority fast fill component of the panel shall coordinate with time fill component and shall be used to control the future flow of compressed fuel into storage through dispenser, high bank, mid bank, low storage bank respectively.

e. Compressor start/stop pressure signal shall be sensed from the high bank pressure, but user switchable to low or mid bank input.

f. Compressor start/stop pressures shall be independently user adjustable between 500 to 4,500 psi.

g. Bid shall include priority/time fill valve panel. A complete shop/working drawing shall be submitted for the panel.

h. Minimum tubing size on the priority/time fill panel shall be 1".

i. Panel components shall be contained alongside the Coriolis mass flow meter in a NEMA Type 3R enclosure.

h. Priority/Time Fill panel shall be ANGI PT-100-E-L-3-1 or equivalent

D. System

1. The dispensing system shall be complete with all equipment piped and wired for automatic and unattended operation. All accessories necessary for testing and routine maintenance must also be included.
2. All tubing shall be stainless steel and designed to 5,000 psig maximum allowable working pressure (MAWP).
3. The dispenser system shall be equipped with an electronically temperature compensated system which will shut off gas to the vehicle tank when the compensated pressure in the tank reaches 3,600 psig

2.04 INSTRUMENTATION

A. Design and Performance Criteria

1. General: All instrument components interfacing with natural gas shall be made of material compatible with specified odorized natural gas.
   a. No copper metal or alloys containing more than 70% copper shall be used in natural gas service.
2. Pressure Gauges: All pressure gauges shall conform to the following requirements:
   a. Accuracy, including hysteresis, shall be plus or minus 0.5% of full scale or better.
   b. Rear blowout protection shall be provided.
   c. All gauges shall be waterproof and oil filled.
   d. The dial shall have a minimum diameter of 2 1/2 inches.
   e. Gauges shall be able to read a minimum of 30% above MAWP.
3. Temperature Gauges: All temperature gauges shall conform to the following requirements:
   a. Accuracy shall be within plus or minus 1% of the full scale or better.
   b. The dial shall have a minimum diameter of 2 1/2 inches.
   c. Gauges shall be able to read a minimum of 50% above maximum working temperature.

B. Manufacturers

1. MDI 972/488-8725
2. Wika 213/538-1599
3. Norshok 216/243-0888
4. PLC-Based Controls: GE; Fanuk; or equivalent

2.05 VALVING

A. Design and Performance Criteria
1. Suction valves shall be carbon steel body with stainless steel trim. All other valves shall be made of stainless steel.
2. Safety relief valves shall have viton seals.
3. Welded ball valve shall be three piece design.
4. Compressor suction line shall have a spring return actuated three-piece fire rated ball valve (API 607).
5. All level operated valves must be equipped with locking kits capable of securing the valve in either an open or closed position.
6. Needle valves shall be stainless steel.

B. Manufacturers
1. Whitey, Hoke, SVF, Nupro, Watts, Marwin, Worchester or equivalent; (Ball valves, check valves, and needle valves).
2. Anderson Greenwood; (Pressure Relief).

2.06 PIPING TUBING

A. Design and Performance Criteria
1. Gas Piping
a. Gas piping design, fabrication, inspection, and testing shall be in accordance with ANSI B31.3.
b. Cast iron piping shall not be used in this contract.
c. Threaded piping connections may be used on 1 ½ inch nominal pipe size and smaller for piping systems with a maximum operating pressure no greater than 150 psig. Otherwise, such piping shall be socket or butt welded.
d. Larger than 1 ½ inch nominal pipe size shall be butt welded.
e. Size of the gas line from Southern California Gas Company meter to the compressor shall be as shown on the plans.
2. Tubing - See Section 43 8100 of these Specifications.

2.07 SYSTEM CONTROLLERS

A. System control shall feature:
1. Compressor Annunciation
a. Suction, Interstage and Discharge Pressures (psig)
b. Suction and Interstage Temperatures (Degrees, Fahrenheit)
c. Compressor Status
d. Date and Time
2. Compressor Shutdowns
a. Low crankcase oil pressure switch gauge
b. Low suction pressure
c. High suction pressure
d. High interstage and discharge temperature set at or below 350°F
e. High crankcase pressure
f. Kill switch (keyed) inside compressor enclosure
g. Emergency shutdown buttons (refer to Section 2.9 for details)
h. Kill switch (keyed) inside compressor enclosure
i. Reset momentary contact switch on panel at compressor enclosure
j. Transducer or thermocouple failure
3. Dryer Annunciation

a. Moisture monitor power on
b. Schedule regeneration
c. Immediate regeneration

6. Note:
   a. All inputs to be wired fail-safe (circuit to open on fault condition).
   b. A minimum of three (3) additional fault shutdowns (per compressor) with annunciation are to be supplied and wired to the terminal strip in the Motor Control Center (MCC) for future use.
   c. Controls are to be organized in a "first out" sequence. LCD readout to be provided for each compressor indicating type and cause of each shutdown.

2.08 EMERGENCY SHUT DOWN (ESD) SYSTEM

A. The ESD system shall operate on 120 VAC and shall be designed to be activated by one of the ESD push buttons.

B. Push buttons shall be red momentary contact mushroom buttons and shall be protected with a hinged cover to prevent accidental activation.

C. Push buttons are to be provided as follows:
   1. One (1) ESD push button at compressor area (see plans).
   2. Twelve (12) ESD push buttons at the time fill dispenser area (see plans).

D. One (1) keyed reset momentary contact switch shall be provided on the ESD panel.

E. When the ESD system is activated, the system shall perform as follows:
   1. All power is removed from any motor contractors and the companion shut-down driver appurtenant to all fuel CNG dispensers.
   2. The power is removed from all solenoid valves, and hence the following valves close automatically:
      a. Dryer inlet valve.
      b. Compressor suction valve.
      c. Compressor discharge valve.
   3. Compressor blowdown valve (unloader) open automatically.
   4. The system status panel shall indicate that an ESD button was pressed. The cause(s) of activation has to be resolved before the system can be reset.

F. A flashing beacon warning device mounted on the skid will be activated when an ESD button is pushed or the compressor faults out due to malfunction.

G. The device will be turned off when a keyed momentary contact switch is activated.

H. Provide adequate labeling of the Emergency Shut Down system so that system operating personnel can readily identify the ESD panel.

2.09 COMPRESSOR SKID AND DRYER SKID

A. Compressor Skid and Dryer Skid shall be a one (1) piece welded steel bolt-down frame. Skid shall be equipped with lifting lugs. Skid shall be anchored to a concrete pad as shown on the plans. The Contractor shall submit drawings, calculations of skid including foundation for approval.

2.10 ALARM/CONTROL FEATURE

A. The compressor/dryer skid will be equipped with a controller that monitors several alarm conditions. At a minimum, these conditions will include:
   1. High inlet pressure
   2. Low inlet pressure
   3. ESD shutdown
   4. High 4th stage discharge temperature
   5. Low oil level
   6. Drive motor failure to start
   7. Power failure
   8. Dryer requiring regeneration
   9. Compressor safety fault
   10. Dryer malfunction
   11. Other conditions as appropriate

B. The alarm/control feature will be equipped with an auto dialer with the following capabilities:
   1. Call out to a given phone number or list of numbers when there is an alarm condition
   2. The ability for someone to call the modem and determine the cause of shutdown
   3. The ability for someone to restart the station remotely, provided the shutdown was not for emergency reasons, such as an ESD shutdown or a compressor safety fault.
   4. The ability for someone to call and quarry system functions

C. The alarm/control feature will also include a flashing beacon that will be activated during alarm conditions set by the Owner.

2.11 PROTECTION BOLLARDS

A. Bollards shall be standard weight galvanized steel pipe concrete filled and wrapped with orange reflectorized tape as required by the Engineer.

2.12 EMERGENCY SHUTDOWN DEVICE STAND

A. Shall be constructed to the dimensions and at the locations shown on the plans. All wiring shall be in conduit and inside the structural steel tubing so that no above ground conduit is visible. Stand shall be furnished in the dimensions shown on the plans, complete with a fire extinguisher and wall hook complying with model TGP-20-G by General Fire (708.272-7500) or equivalent.

2.13 REINFORCED CONCRETE TYPE "K" RAILS

A. Twenty-foot (20') lengths conforming to Temporary Railing Type "K," detail T3, of the Caltrans Standard Plans.

2.14 PRECAST CONCRETE BOXES

A. To sizes, dimensions and locations shown on the plans, conforming to Christy Concrete Products, Inc. (510.637.7070) or equivalent.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Contractor shall install compressor skid and dryer skid and dispensers as shown on the plans and as approved by the Owner. Equipment installation shall meet California Building Code Seismic Zone 4 requirements for mechanical essential components. Contractor is responsible for making any slab thickness or reinforcement modifications required for Zone 4 equipment constraint.

3.02 TESTING

A. Shop Tests

1. All testing at the Contractor assembly facility shall be coordinated with the Engineer a minimum of seven (7) days prior to intended test date. Tests shall include, as a minimum, the items listed below. Copies of all test reports and other documentation indicated below shall be forwarded to the Engineer a minimum of two (2) business days prior to shipment of the unit, (original and five (5) copies of each report).
2. The Owner reserves the right to inspect the Contractor's facility at any time during this contract without prior notice.
3. Pressure Testing - General
   a. All gas piping shall be pressure tested pneumatically. Shop reports must be signed by the Contractor's test engineer or his/her designate and must include, as a minimum:
      1) Spool Number
      2) Spool Description
      3) Safety Relief Valve (SRV) setting
      4) Test Pressure
      5) Test Duration
      6) Test Date
      7) Signature of Technician
   b. Prior to performing tests, all SRV's and filter cartridges shall be removed from the system. Subsequent to the pressure tests, the SRV's and filter cartridges shall be reinstalled.
4. Pneumatic Testing: Pneumatic testing shall be done at 1.1 times the SRV setting for thirty (30) minutes minimum. Pneumatic tests should be performed with air or inert gas. Pipes should be removed or isolated to prevent test gas from entering the compressor or other piping spools. Pre-testing to approximately 60 psig is recommended, to locate major deficiencies. Subsequent pressure increases should be made gradually to prevent "shocking" of the pipe system. At the end of the half hour test an inspection of all connections (welded, threaded, compression and flanged) with Nupro Snoop (or approved equivalent) leak detector, shall be performed.
5. Functional Test: The Contractor shall perform the following functional tests. Tests shall be performed on natural gas.
   a. Controls operation including compressor startup, normal safety shutdowns and system annunciation.
   b. Compressor operation parameters (temperatures, pressures and vibration levels).
   c. Operation of all subsystems including priority-fill, sequencing, emergency shut-down and remote alarms.
   d. As per item b) with prolonged continuous operations of one (1) hour or more. This operation to be repeated until a minimum two (2) hours of full load operation has elapsed.

B. Field Test

1. Contractor shall submit method of startup and testing to the Engineer for approval in accordance with the “Submittals” section of the Contract.
2. After the installation is complete, the Contractor shall thoroughly clean all tubing to manufacturer's requirements by blowing out with 4,000 psi of Nitrogen gas at required durations (see also Section 43 81 00 of these specifications). The Contractor shall then repeat all leak and functional tests in the field. These tests shall comply to code requirements to the complete satisfaction of the Fire Marshall representative and the Owner. The Contractor shall give the Engineer at least three (3) business days advance notice so that the Engineer may coordinate with the Fire Marshall representative for witnessing the tests.
3. The Contractor shall provide all materials, equipment, instrumentation and labor for the tests. The Contractor is allowed to use natural gas and electricity available at the site for the tests.
4. The field test procedure shall include a demonstration of compressor capacity. It is suggested that this test be conducted by timing the natural gas throughout at the fueling station gas meter during measured time intervals.
5. Safety precautions shall be exercised at all times. Pressure shall be introduced slowly in increments not to exceed 500 psig at 15 minute intervals without written authorization by the Engineer. At each interval all connections shall be soaped and checked for leaks.
6. After all connections are proved sealed, record pressure (design plus 20%) and allow to set for one hour. This is the standing pressure test. After one hour compare test pressure to recorded pressure. If pressures are the same, bleed off gas in a controlled and safe manner. If the test pressure is lower than the recorded pressure, find and repair the leak and repeat standing pressure test.
7. Startup testing shall be witnessed by the Owner’s design Engineering consultant one time at no cost to the contractor. If additional startup visits are required due to reasons within the Contractor’s control, Contractor shall pay the hourly rate and expenses of the engineering consultant for all subsequent startup site visits. Contractor is therefore advised to perform a trail startup in advance of the actual startup.

3.03 PAINTING

A. The unit shall be painted according to the following requirements:

1. All surfaces except factory painted with finished coats shall be cleaned of oil, dirt, and corrosion with a cleaning solution approved by the paint manufacturer. A prime coat of oxide primer shall be applied the same day as the cleaning process. A minimum of two (2) coats of industrial alkyd enamel paint shall be applied over the primer, in accordance with the paint manufacturer's specifications.
2. Subsequent to the paint fully hardening, all lamacoid labels shall be mounted.
3. Colors shall be as follows (skid components only):
   a. Suction Gas Piping: Silver (heat resistant)
   b. Gas Vent Piping: Bright Yellow
   c. Gas/Heat Detector Conduit: Red

B. The skid shall be sandblasted to white metal and primed with one (1) coat of anti corrosion oxide primer, and two (2) coats of industrial alkyd enamel in color to be approved by the Engineer, in accordance with the paid manufacturer's specifications.

3.04 TRAINING

A. General: The Contractor shall provide a minimum of eight (8) hours of on-site classroom and field training to Owner personnel covering the operation and maintenance of the station components.

B. Instruction: The instruction shall be presented by manufacturer's representative of the CNG equipment and shall be certified by the manufacturer to provide such instruction. Prior to providing instruction, the Contractor shall submit résumés of the instructor(s) for review and approval by the Engineer.

C. Course Materials: Prior to providing instruction, Contractor shall submit the following for review and approval by the Engineer:
   1. Program of instruction of classroom and field training
   2. Training course content (hard copy printout)
   3. Course handouts
   4. Diagrammatic layout of equipment installed
   5. Equipment user's manual
   6. Operations and maintenance manuals provided.

D. Course Content: The training shall cover operator-level instruction on the following areas for this particular station. Instruction shall make reference to O&M manuals.

   Classroom Training
   1. Introduction to Compressed Natural Gas
   2. Health and safety issues related to natural gas and precautions to be taken around installed equipment
   3. Overview of the recommended operations and maintenance requirements
   4. Major Components of the CNG Station
      a. Described individually and how they integrate into the station
      b. Identified physically in the field
      c. Operator's checks and services
   5. System Components to Include the Following:
      a. Power and control panel
      b. Gas dryer
      c. Compressor and accessories
      d. Electric motor
      e. Dispensers
   6. Maintenance Activities
      a. Types of maintenance
      b. Monitoring system operations
      c. Managing maintenance activities
      d. Routine inspections (provide handouts)
      e. Maintenance records (provide handouts)
   7. Safety Procedures and Guidelines
   8. NGV Facility Safety
   9. Business Plan Modification
   10. Alarm Procedures
      a. Conditions
      b. Features provided
      c. Actions to be taken
   11. Fueling Operations
      a. Routine
      b. Emergency

12. Monitoring and Control of System Functions
    a. Locally
    b. Remotely by modem and by telephone
13. Parts and Outside Service
    a. Show how to use previously provided parts list and how to order parts
    b. Make recommendations regarding spare parts that should be kept in stock
    c. Identify local supplier of parts; name, address, phone and fax
    d. Identify local service representative; name, address, phone and fax.
14. Log Book
    a. Provide a log book with all appropriate charts and instructions to facilitate all necessary maintenance activities on CNG station components.

Field Training

1. Training procedures shall have been favorably reviewed and approved by the Owner prior to starting field training.
2. Field training shall be administered on-site using the delivered system in real time situations. Field training shall not start until the Operation Testing has been completed and approved by the Owner and the corresponding Operation and Maintenance Manuals have been submitted and approved.
3. The “Training Plan” shall be conducted by a qualified supplier person(s), who has conducted similar training for the type of system supplied.
4. Acceptable Operation and Maintenance Manuals shall be on-site and available when training sessions are implemented.
5. Field training shall be held after any necessary classroom training for the equipment has been completed.

END OF SECTION

SECTION 43 81 00

STAINLESS STEEL TUBING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This specification covers austenitic stainless steel tubing in straight lengths or coils for compressed natural gas.

1.02 APPLICABLE DOCUMENTS

American Society for Testing and Materials (ASTM)
A269, Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

American National Standards Institute (ANSI)
Z1.4-81, Sampling Procedures and Tables for Inspection by Attributes.

1.03 SUBMITTALS

A. In accordance with the “Submittal” section of the Contract.

PART 2 - PRODUCTS

2.01 GENERAL

A. The tubing shall be seamless, fully annealed tube for general service conforming to the requirements of ASTM A269 for Grades TP 316 material having a minimum ultimate tensile strength of 75,000 psi. Tubing shall be cold finished and free of scratches.

2.02 DIMENSIONS

A. Tubing shall be furnished with minimum wall thickness no less than required to operate with a maximum allowable working pressure (MAWP) of 5,000 psig:

TUBE WALL THICKNESS (inches)

Outside Diameter	Wall Thickness
½	0.083
¾	0.109
1.0	0.134

2.03 DISTRIBUTORS

B&B Surplus, Bakersfield, CA (661.589.0381) or equivalent.

PART 3 – EXECUTION

3.01 TEST

A. Tubing shall be hydrostatically tested to one hundred percent (100%) of the design pressure for a minimum of five seconds without leakage or damage.

3.02 PREPARATION FOR DELIVERY

A. Preparation for Delivery: The internal and external surfaces of the tubing shall be provided with adequate protection from corrosion and abrasion during normal handling and storage.

3.03 CERTIFICATION

A. The manufacturer or vendor shall be prepared to certify that the tubing conforms with the requirements of this specification.

3.04 ACCEPTANCE INSPECTION

A. The Owner may make inspections that are necessary to determine conformance with this specification. Quality acceptance sampling will be performed in accordance with ANSI Z1.4, by using General level I in Table I and an appropriate Acceptance Quality Level as given in Table III-A. When the sample inspected or the performance tests indicate that items do not meet this specification, the Owner will then, at its option, reject either the defective items or the entire lot.

B. If a field installed item fails to meet this specification, the unused portion of the lot is subject to further acceptance testing and possible rejection.

3.05 INSTALLATION

A. Stainless steel tubing shall be installed where shown on the plans in strict accordance with manufacturer's requirements. The Contractor shall be certified by the stainless steel tubing and fitting manufacturer for installation of high pressure tubing and fittings.

3.06 FIELD TEST

A. After the installation is complete, the Contractor shall thoroughly clean all tubing to manufacturer's requirements by blowing out with 4,000 psi of Nitrogen gas at required durations. The Contractor shall then repeat all leak and functional tests in the field. These tests shall comply to code requirements to the complete satisfaction of the Fire Marshall representative and the Owner. The Contractor shall give the Owner at least three (3) business days advance notice so that the Owner may coordinate with the Fire Marshall representative for witnessing the tests.

END OF SECTION