COUNTY OF TULARE

STATE OF CALIFORNIA

BID DOCUMENTS AND SPECIFICATIONS

FOR CONSTRUCTION OF

TULARE COUNTY TRANSIT OPERATIONS AND MAINTENANCE FACILITY

FUNDED BY:

Transportation Development Act – Local Transportation Fund
Transportation Development Act- State Transit Assistance Fund
FHWA Congestion Mitigation and Air Quality Improvement Program Grant
CalOES California Transit Security Grant Program
Tulare County Measure R Funds
Public Transportation Modernization Improvement and Service Enhancement Account

VOLUME 1

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STATE OF CALIFORNIA

SPECIFICATIONS, PROPOSAL AND CONTRACT

FOR CONSTRUCTION OF

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APPROVED: _____ DATE: 12.04.2017
Pete Vander Poel, Chairman
County of Tulare Board of Supervisors

APPROVED: _____ DATE: 11/15/17
Reed Schenke, P.E.
RMA Director

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SECTION 000020 – ADVERTISEMENT FOR BIDS

ADVERTISEMENT FOR BIDS
TULARE COUNTY
TRANSIT MAINTENANCE AND OPERATIONS FACILITY
14001 Avenue 256 Visalia, CA 93292

NOTICE IS HEREBY GIVEN that individually sealed bids for the **Transit Maintenance and Operations 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 **2:00 p.m.** on **Thursday, February 1, 2018.**

Project Description: This new facility will be constructed on the undeveloped parcel of land located adjacent to the existing County of Tulare's Road Yard near the intersection of Avenue 256 and Road 140 Visalia, CA. The project consists of construction of a maintenance building operations building, a CNG fueling area, installation of utilities including storm drain, water lines, seepage pits and sewer lines. The contractor will provide a 1-year workmanship guarantee.

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, January 11, 2018.** The pre-bid conference is optional; Bidders that attend shall sign the pre-bid conference attendance roster.

Plans, specifications, and proposal forms for bidding this project can only be obtained at the 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 $60.00 per set for the documents. When obtaining the documents verify the name of the project as several projects could be open at the same time. An unofficial set of Plans, Specifications, and other project information is available for download at the County's website at the following address:

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

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

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

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

TIME OF COMPLETION: The Project is to be completed within **426** 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

Michael C. Spata
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 $60.00 per set for the documents. When obtaining the documents verify the name of the project as several projects could be open at the same time. An unofficial set of Plans, Specifications, and other project information is available for download at the County's website at the following address:

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

EXAMINATION:

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

A non-mandatory pre-bid conference will be held at **10:00 a.m. on Thursday January 11, 2018** 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 such item not brought to the County's attention by **4:30 p.m., Thursday, January 18, 2018** shall be done in accordance with the County's interpretation for the good of the work in accordance with the intent and meaning of the Contract Documents. Neither County nor County's Representative will be responsible for oral instructions or information. Questions received by **4:30 p.m. on Thursday, January 18, 2018** 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:

Failure to sign the bid
Failure to furnish the required bid bond on the County-provided form or a cashier's check in an amount equal to 10% of the bidder's base bid
Failure to include a total amount of the bid
Failure to submit a completed addenda certification statement

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.

<u>BID PROTESTS</u>:

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.

NON-COLLUSION DECLARATION:

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

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 13%.

The goals for female and minority participation for compliance with 45 Federal Regulations 65984 in projects located in Tulare County is 23.6%.

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" (Located in the Proposal Section) 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.

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CONTINUE TO NEXT PAGE

EXHIBIT 15-G CONSTRUCTION CONTRACT DBE COMMITMENT

1. Local Agency: Tulare County Resource Management Agency 2. Contract DBE Goal: 13%

3. Project Description: CNG Fueling Facility

4. Project Location: 14001 Avenue 256 Visalia, CA 93292

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: CML-5946(155)

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. CML-5946(155) _____ Bid Opening Date _____

The _____established a Disadvantaged Business Enterprise (DBE) goal of 13 % 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	Method/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.

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END OF SECTION 000200

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 _10____.

- For electrical trades a total of three (3) apprentices was calculated.
- For earthwork a total of one (1) apprentices was calculated.
- For building elements and the building envelope a total of five (5) apprentices was calculated.
- For concrete work a total of one (1) apprentices was calculated.

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

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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: 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:

CONTINUE TO NEXT PAGE

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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 subrecipients shall certify and disclose accordingly.

_____

(Signature) (Date)

_____

(Name and Title)

_____

(Company Name)

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DISCLOSURE OF LOBBYING ACTIVITIES

COMPLETE THIS FORM TO DISCLOSE LOBBYING ACTIVITIES PURSUANT TO 31 U.S.C. 1352

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
- 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 Lobby Entity
(If individual, last name, first name, MI)

b. Individuals Performing Services (including address if different from No. 10a)
(last name, first name, MI)

(attach Continuation Sheet(s) if necessary)

11. Amount of Payment (check all that apply)

$_____ ☐ actual ☐ planned

12. Form of Payment (check all that apply):

- ☐ a. cash
- ☐ b. in-kind; specify: nature _____
  value _____

13. Type of Payment (check all that apply)

- ☐ a. retainer
- ☐ b. one-time fee
- ☐ c. commission
- ☐ d. contingent fee
- ☐ e deferred
- ☐ f. other, specify _____

14. Brief Description of Services Performed or to be performed and Date(s) of Service, including officer(s), employee(s), or member(s) contacted, for Payment Indicated in Item 11:

(attach Continuation Sheet(s) if necessary)

15. Continuation Sheet(s) attached: Yes ☐ No ☐

16. Information requested through this form is authorized by Title 31 U.S.C. Section 1352. This disclosure of lobbying reliance was placed by the tier above when his transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to Congress semiannually 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: _____

Authorized for Local Reproduction
Standard Form - LLL

Federal Use Only:

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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 covered Federal action or a material change to previous filing pursuant to title 31 U.S.C. section 1352. The filing of a form is required for such payment or agreement to make payment to 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. Attach a continuation sheet for additional information if the space on the form is inadequate. 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 subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the first tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in Item 4 checks "Subawardee" 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 organization 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 identification in item 1 (e.g., Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract grant. or loan award number, the application/proposal control number assigned by the Federal agency). Include 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 commitments 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 entity engaged by the reporting entity identified in item 4 to influenced 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. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box. Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box. Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed or will be expected to perform and the date(s) of any services rendered. Include all preparatory and related activity not just time spent in actual contact with Federal officials. Identify the Federal officer(s) or employee(s) contacted or the officer(s) employee(s) or Member(s) of Congress that were contacted.
15. Check whether or not a continuation sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name title and telephone number.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instruction, 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, D.C. 20503.

SF-LLL-Instructions Rev. 06-04-90»ENDIF»

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

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

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

   The above amount may be modified by amounts indicated by the Bidder on the attached Document 004322 "Unit Prices Form" and the schedules of alternates listed in Subsection 11 of this Section.

11. ALTERNATES
   A. Alternate No. 1: BUILD-OUT AT OPERATIONS BUILDING
      1. Base Bid: Provide full interior build-out of the Operations Building as indicated on Sheet A-2.21 Overall Plan – Operations.
      2. Alternate (Deduct): Provide partial interior build-out of the Operation Building as indicated on Sheet A-2.22 Overall Plan - Alternate.
         Cost Deduction for Partial Interior Build Out
         (Words)_____
         _____Dollars
         $_____(Figures)

   B. Alternate No. 2: FLOORING - MAINTENANCE BUILDING
      1. Base Bid: Provide sealed, hardened and polished concrete floor finish as indicated on Sheet A-5.05 Finish Schedule and as specified in Sections 03 3518 – Concrete Cure, Sealer and Hardener and 03 3543 – Polished Concrete Flooring.
      2. Alternate: Provide high-Build Epoxy Floor Finish as indicated on Sheet A-5.05 Finish Schedule and as specified in Section 09 9123 – Interior Painting.
      Cost increase for high-build epoxy floor finish
      (Words)_____
      _____Dollars
      $_____(Figures)

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C. Alternate No. 3: MONUMENT SIGN
   1. Base Bid: Provide monument sign as indicated on Sheet A-1.04 Enlarged Site Plans.
   2. Alternate (Deduct): Monument sign not included in the scope of work.

   Cost deduction for removal of monument sign

   (Words)_____

   _____Dollars

   $_____(Figures)

D. Alternate No. 4: ROAD 140 WORK
   1. Base Bid: Road 140 work not included in the scope of work.
   2. Alternate: Provide Road 140 work as indicated on Sheets C7.01 and C7.02

   Cost increase for Road 140 Work as indicated on Sheets C7.01 and C7.02

   (Words)_____

   _____Dollars

   $_____(Figures)

E. Alternate No. 5: JIB CRANE – MAINTENANCE BUILDING
   1. Base Bid: Jib crane not included in the scope of work.
   2. Alternate: Provide jib crane as indicated on Sheets Q-1.01 and Q-1.02.

   Cost increase for jib crane as indicated on Sheets Q1.01 and Q1.02

   (Words)_____

   _____Dollars

   $_____(Figures)

F. Alternate No. 6: LUBRICATION AND FLUIDS DISTRIBUTION SYSTEM – MAINTENANCE BUILDING
   1. Base Bid: Provide lubrication and fluids distribution system as indicated on Sheets Q-1.01 and Q-1.02.
   2. Alternate: Provide manual lubrication and fluids pumps as indicated on Sheets Q-1.01 and Q-1.02.

   Cost deduction for manual lubrication and fluids pumps as indicated on Sheets Q1.01 and Q-1.02

   (Words)_____

   _____Dollars

   $_____(Figures)

G. Alternate No. 7: STUCCO SYSTEM – OPERATIONS BUILDING
   1. Base Bid: Provide a 3-coat stucco system exterior finish at the Operations Building per Sheet A-4.21 and as specified in Section 09 2400 – Cement Plastering (Stucco).
   2. Alternate: Provide a 1-coat stucco system exterior finish at the Operations Building per Sheet A-4.21 and as specified in Section 09 2400 – Cement Plastering (Stucco).

   Cost deduction for 1-Coat Stucco in lieu of 3 Coat Stucco at Operations Building Sheet A-4.21

   (Words)_____

   _____Dollars

   $_____(Figures)

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12. TIME OF COMPLETION
    A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and shall fully complete the Work within 426 calendar days.

13. BID SUPPLEMENTS
    A. The following supplements are a part of this Bid Form and are attached hereto.
        1. Bid Form Supplement - Unit Prices Section 000312

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

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

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;

16. SUBMISSION OF BID

A. Respectfully submitted this ____ day of _____, 2018

B. Submitted By:_____

(Name of bidding firm or corporation)

C. Authorized Signature: _____ (Handwritten signature)

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

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

F. Type of Organization: _____

G. Witnessed By:_____(Handwritten signature)

H. Attest:_____(Handwritten signature)

I. Witnessed By:_____(Handwritten signature)

J. By:_____(Type or print name)

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

L. Street Address:_____

M. City, State, Zip:_____

N. Phone:_____

O. License No.:_____

P. Federal ID No.:_____

Attachments:

_____ Bid Security
_____ Sub-contractor List
_____ Non-Collusion Declaration
_____ Corporate Resolution authorizing Signature of Document (if Corporation)
_____ Public Contract Code Section 10285.1 Statement
_____ Public Contract Code 10232 Statement
_____ Debarment and Suspension Certification
_____ Non-lobbying Certification for Federal Aid Contracts
_____ Disclosure of Lobbying Activities
_____ Certificate of Buy American Compliance
_____ Certification of Exclusion of Builder's Risk Insurance
_____ Bid Supplement Unit Prices Section 000312

Contractor License:

DIR Registration No.:_____

Class:_____

Numbers:_____

Expiration Dates:_____

Seal (if Corporation)

END OF SECTION 00310

SECTION 000312 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

1.2 DEFINITIONS

A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS
(Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

The items listed in the following table require disclosure of unit prices. The following paragraphs describe what sheets may be consulted for each respective item number.

Item Numbers 1-4 Furnish and Install Sanitary Sewer Lines (As indicated on Sheet C4.03 – Sanitary Sewer Plan). Cost for each item shall include the cost of excavation, backfill, compaction, material cost and any associated work necessary to perform the installation of the material specified. The unit of measure is indicated for each item.

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CONTINUE TO NEXT PAGE

Item Numbers 5-7 Furnish and Install Water Lines (As indicated on Sheet C4.02 – Water System Plan). Cost for each item shall include the cost of excavation, backfill, compaction, material cost and any associated work necessary to perform the installation of the material specified. The unit of measure is indicated for each item.

Item Numbers 8-14 - Furnish and Install Storm Drain Lines, Storm Drain Manholes, Outfall and Outlet Structures (As indicated on Sheet C4.01 – Storm Drainage Plan). Cost for each item shall include the cost of excavation, backfill, compaction, material cost and any associated work necessary to perform the installation of the material specified. The unit of measure is indicated for each item.

Item Number 15 Excavate Retention Basin (As indicated on Sheet C3.02). The unit cost for this item is to include the cost of material haul off, excavation and grading to the specifications provided by the referenced sheet.

Item Number 16 Furnish and Install Data Conduit. Cost per linear foot to provide 1in data fiber, conduit, trenching and backfill.

Item Number 17 Access Road (As indicated on Sheet C-2.01 and Sheet 3.01). The unit cost for this item is to include the cost of material hauloff, grading, and application of asphalt concrete to construct the portion of roadway shown on the referenced sheets.

ITEM NO.	ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS	UNIT OF MEASURE	UNIT PRICE (IN FIGURES)
1	Furnish and Install Sanitary Sewer Manhole @_____Dollars Per Each	EA	$_____/EA
2	Furnish and Install 4in Sanitary Sewer Line @_____Dollars Per Linear Foot	LF	$_____/LF
3	Furnish and Install 6in Sanitary Sewer Line@_____Dollars Per Linear Foot	LF	$_____/LF
4	Furnish and Install 8in Sanitary Sewer Line @_____Dollars Per Linear Foot	LF	$_____/LF
5	Furnish and Install 4in Water Line @_____Dollars Per Linear Foot	LF	$_____/LF
6	Furnish and Install 6in Water Line @_____Dollars Per Linear Foot	LF	$_____/LF
7	Furnish and Install 10in Water Line @_____Dollars Per Linear Foot	LF	$_____/LF
8	Furnish and Install 12in Storm Drain Line @_____Dollars Per Linear Foot	EA	$_____/EA
9	Furnish and Install 15in Storm Drain Line @_____Dollars Per Linear Foot	LF	$_____/LF
10	Furnish and Install 18in Storm Drain Line @_____Dollars Per Linear Foot	LF	$_____/LF

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CONTINUE TO NEXT PAGE

ITEM NO.	ITEM DESCRIPTION WITH UNIT PRICE WRITTEN IN WORDS	UNIT OF MEASURE	UNIT PRICE (IN FIGURES)
11	Furnish and Install 24in Storm Drain Line @_____Dollars Per Linear Foot	LF	$_____/LF
12	Furnish and Install 30in Storm Drain Line @_____Dollars Per Linear Foot	LF	$_____/LF
13	Furnish and Install Storm Outlet Structure@_____Dollars Per Each	EA	$_____/EA
14	Furnish and Install Storm Outfall Structure@_____Dollars Per Each	EA	$_____/EA
15	Excavate Retention Basin@_____Dollars Per Cubic Yard	CY	$_____/CY
16	Furnish and Install Data Conduit @_____Dollars Per Linear Foot	LF	$_____/LF
17	Furnish and Install Access Road @_____Dollars Per Cubic Yard	CY	$_____/CY

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END OF SECTION 012200

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 other side & extra sheets if necessary)

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

_____ _____

Date Contractor's Signature

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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 000313 - 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

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

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.

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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 **Thursday February 1 or 8, 2018**, for construction on the Tulare County – **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 _____, 2016.

_____ (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 3247 through 3252

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

AGREEMENT

BETWEEN

COUNTY AND CONTRACTOR

AGREEMENT

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

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

and the Contractor: _____

The Project: 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 the Notice to Proceed is received by the Contractor and, subject to authorized adjustments, Substantial Completion of the Work Shall be achieved not later than **426** 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 $4800.00 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

Ross Miller – County of Tulare
Resource Management Agency
5961 S. Mooney Blvd.
Visalia, CA 93277
(559) 624-7070 – Phone

SURETY

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: Michael C. Spata
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 - STATE WAGE DETERMINATION

1.1 **INSTRUCTIONS:**

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

GENERAL CONTRACTOR

IS REQUIRED

TO POST

THIS

STATE WAGE DETERMINATION

ON THE JOB SITE

FOR THE PROJECT:

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

END OF SECTION 000507

SECTION 000508 - PAYROLL SUBMITTAL INFORMATION

1.1 **INSTRUCTIONS FOR PAYROLL SUBMITTALS**

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

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

B. Number of Withholding Exemptions.

C. Work Classification.

D. Day, Date and Hours Worked.

E. Total Hours.

F. Rate of Pay.

G. Gross Pay.

H. Deductions.

I. Net Wages Paid.

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END OF SECTION 000508

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

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

Identifying Information

Name of Claimant: _____

Name of Customer: **County of Tulare**

Job Location: **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

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

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

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

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

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

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

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

superintendent.

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

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

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

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

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

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

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

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

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

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

Proposed Change Order (PCO).

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

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

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

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

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

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

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

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

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

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

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

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

“Subcontractor” shall include all persons or firms within the authority of the Subletting and Subcontracting

Fair Practices Act, Chapter 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

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.

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

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

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

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

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

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

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

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

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

Short Interval Schedules.

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

Responsibility for Completion.

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

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

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

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

Failure of the Contractor to comply with the requirements of "Short Interval Schedules"

shall be considered grounds for a determination by the County, pursuant to Article 14, that the Contractor is failing to prosecute the Work with such diligence as will ensure its completion within the time specified.

Daily Reports

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

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

4.11 RECORDS, DOCUMENTS AND SAMPLES AT THE SITE

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

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

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

4.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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

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

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

4.12.4 The Contractor, at its sole cost and expense, shall furnish to the Construction Manager all drawings and other descriptive material as are required by the specifications or requested by the Engineer. Shop drawings shall be done with sufficient detail to adequately describe items proposed to be furnished or methods of installation to enable the County and Engineer to determine compliance with the specifications and with the design and arrangement shown on the working drawings. The Construction Manager will not accept shop drawings or manufacturers' instructions which are not

sufficiently dimensioned and detailed to demonstrate compliance with the Contract Documents.

The Contractor shall check and coordinate all submittals with the work of all trades involved before they are submitted.

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

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

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

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

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

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

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

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

FAILURE BY THE CONTRACTOR TO IDENTIFY IN ITS LETTER OF TRANSMITTAL ANY VARIATION, DISCREPANCY, OR CONFLICT WITH THE CONTRACT DOCUMENTS SHALL RENDER THE

APPROVAL NULL AND VOID, AND THE CONTRACTOR SHALL BEAR ALL RISK OF LOSS AND RECONSTRUCTION COSTS OR DELAYS.

If any architectural, plumbing, mechanical, electrical, or structural modifications are required as a result of the approval of shop drawings or manufacturers' instructions which deviate from or do not comply with the Contract Documents, those modifications shall be made without extra cost to the County, and without extension of the Contract Time. Any other resultant costs, including but not limited to design fees, Construction Management fees, cost incurred by other contractors, or inspection fees, shall be at the expense of the Contractor.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.12.17 Brochures: Following Contractor's review and approval, he or she shall submit to the Construction Manager, six (6) copies of all manufacturer's catalogs or brochures as required. If a brochure is stamped "No Exception Taken", two (2) copies will be returned

to the Contractor. If stamped "Rejected", one marked copy and two (2) unmarked copies will be returned. Corrected copies shall be resubmitted for approval as per the original submittal.

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

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

4.13 USE OF SITE

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

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

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

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

4.14 CUTTING AND PATCHING OF WORK

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

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

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

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

4.15 CLEANING UP

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

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

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

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

4.15.3 <u>Final Cleaning of Project</u>

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 or the Assistant Director for Public Works r 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.

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 150 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 13.1.2.1, 13.1.2.2, or 13.1.2.3 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 13.1.2.3 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 13.1.3. "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 13.1.3 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 **Tulare County – Transit Operations and Maintenance Facility Project**, which we 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 proceed to have said defects repaired and made good at the expense of the undersigned, which will pay the costs and charges therefore upon demand.

	Countersigned
_____	_____
(Proper name)	(Proper name)
Date of signature: _____	Date of signature: _____
_____	_____
(Printed name)	(Printed name)
By: _____	By: _____
_____	_____
(Signature of Subcontractor or General Contractor)	(Signature of General Contractor if for Subcontractor)

Representatives to be contacted for services;

Name: _____

Address: _____

_____

Telephone Number: _____

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END OF SECTION 000700

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
Divisions 01-14
Volume 1

Tulare County
Transit Operations & Maintenance Facility (TOMF)

14001 Avenue 256
Visalia, CA

Construction Documents

PREPARED FOR:
TULARE COUNTY

June 1, 2017
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

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REGISTERED PROFESSIONAL ENGINEER BRYAN A. GLASS No. E 17773 06-30-18 ELECTRICAL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ROBERT F. GOTTSCHALK No. C84280 CIVIL STATE OF CALIFORNIA EXP. 9/30/17

REGISTERED PROFESSIONAL ENGINEER GARTH A. PECCHENINO No. 52678 CIVIL STATE OF CALIFORNIA
Exp. 12/31/17
Date: 6/1/2017

REGISTERED PROFESSIONAL ENGINEER MONIQUE C. MELLO NO. 74523 CIVIL STATE OF CALIFORNIA
Exp. 12/31/17
Date: 6/1/2017

SECTION 01 0000

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 50 00 – 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 50 00 – 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 Phoenix 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 1000

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)," or "Tulare County Transit Facility (TOMF)."
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 operations building and maintenance building. The operations building houses offices and supporting areas for the county of Tulare, CA transit staff and bus drivers. The maintenance building is a major repair facility serving the county of Tulare's CNG-powered vehicles, including buses. There will be onsite CNG slow-fill dispensing provided for the buses. Project includes site improvements including road works, perimeter fencing, and integration with new water system, as well as utilities, buildings, security systems, fixtures, and 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 City of Visalia.

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 1200

MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.01 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 011000 "Summary" for the Work covered by the Contract Documents, restrictions on use of Project site,[**phased construction,**] coordination with occupants, and work restrictions.

1.02 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.

1.03 PROJECT COORDINATOR

A. Project coordinator shall be responsible for coordination between the [**General Construction Contract**] [**Plumbing Contract**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.

B. [**Mechanical/electrical**] <**Insert name**> coordinator, who shall be under the direction of the Project coordinator, shall be responsible for coordination between the [**Plumbing Contract**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.

1. [**HVAC Contractor**] [**Electrical Contractor**] [**Plumbing Contractor**] <**Insert entity**> shall act as mechanical/electrical coordinator. [**Mechanical/electrical coordinator shall be licensed to practice as a professional engineer in location of Project.**]

1.04 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 014000 "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. Locate existing permanent benchmarks, control points, and similar reference points, and establish permanent benchmarks on Project site.
14. Provide field surveys of in-progress construction and site work[**and final property survey**].
15. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one contractor has worked.
16. Coordinate cutting and patching.
17. Coordinate protection of the Work.
18. Coordinate firestopping.
19. Coordinate completion of interrelated punch list items.
20. 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.
21. Print and submit record documents if installations by more than one contractor are indicated on the same contract drawing or shop drawing.
22. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
23. 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.
24. <**Insert coordination activities**>.

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.
3. <**Insert temporary facilities and controls**>.

1.05 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 [**the General Construction Contract**] [**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 [**the General Construction Contract**] [**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**] [**each contract for its own work**].
5. Equipment pads for the work of each contract shall be the work of [**the General Construction Contract**] [**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**] [**each contract for its own work**].
7. Painting for the work of each contract shall be the work of [**the General Construction Contract**] [**each contract for its own work**].
8. Cutting and Patching: [**Provided by the General Construction Contract**] [**Provided under each contract for its own work**] [**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 [**the General Construction Contract**] [**each contract for its own work**].
10. Contractors' Startup Construction Schedule: Within [**five**] <**Insert number**> 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. [**Project coordinator**] [**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 015000 "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 Contract**] [**The HVAC Contract**] [**Project coordinator**] is responsible for temporary heating, cooling, and ventilation, including utility-use charges, temporary meters, and temporary connections.

E. Temporary Heating, Cooling, and Ventilation: [**The General Construction Contract**] [**The HVAC Contract**] [**Project coordinator**] is responsible for temporary heating, cooling, and ventilation before weathertight enclosure of building is complete. [**The General Construction Contract**] [**The HVAC Contract**] [**Project coordinator**] is responsible for temporary heating, cooling, and ventilation after permanent enclosure of building is complete[**and Owner will pay utility-use charges**].

F. 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 [**General Construction**] [**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 [**General Construction**] [**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 [**General Construction**] [**Electrical**] Contract.

1.06 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.
2. <**Insert descriptions of the Work**>.

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**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.
2. <**Insert temporary facilities and controls**>.

1.07 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**] [**Plumbing Contract**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.
2. <**Insert descriptions of the Work**>.

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**] [**Plumbing Contract**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.

2. <**Insert temporary facilities and controls**>.

1.08 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**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.
2. <**Insert descriptions of the Work**>.

B. Temporary facilities and controls in the HVAC Contract include, but are not limited to, the following:

1. <**Insert temporary facilities and controls**>.

1.09 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**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.
2. <**Insert descriptions of the Work**>.

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**] [**HVAC Contract**] [**Electrical Contract**] [**and**] <**Insert name of contract**>.
2. <**Insert temporary facilities and controls**>.

1.10 <**INSERT NAME OF CONTRACT**>

A. Work in the <**Insert name**> Contract includes, but is not limited to, the following:

1. <**Insert descriptions of the Work**>.

B. Temporary facilities and controls in the <**Insert name**> Contract include, but are not limited to, the following:

1. <**Insert requirements for temporary facilities and controls**>.

PART 2 - **PRODUCTS** (Not Used)

PART 3 - **EXECUTION** (Not Used)

END OF SECTION

SECTION 01 2300

ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.02 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
   2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. Alternate No. 1: BUILD-OUT AT OPERATIONS BUILDING
   1. Base Bid: Provide full interior build-out of the Operations Building as indicated on Sheet A-2.21 Overall Plan – Operations.
   2. Alternate (Deduct): Provide partial interior build-out of the Operation Building as indicated on Sheet A-2.22 Overall Plan - Alternate.

B. Alternate No. 2: FLOORING - MAINTENANCE BUILDING

1. Base Bid: Provide sealed, hardened and polished concrete floor finish as indicated on Sheet A-5.05 Finish Schedule and as specified in Sections 03 35 18 – Concrete Cure, Sealer and Hardener and 03 35 43 – Polished Concrete Flooring.
2. Alternate: Provide high-Build Epoxy Floor Finish as indicated on Sheet A-5.05 Finish Schedule and as specified in Section 09 91 23 – Interior Painting.

C. Alternate No. 3: MONUMENT SIGN

1. Base Bid: Provide monument sign as indicated on Sheet A-1.04 Enlarged Site Plans.
2. Alternate (Deduct): Monument sign not included in the scope of work.

D. Alternate No. 4: ROAD 140 WORK

1. Base Bid: Road 140 work not included in the scope of work.
2. Alternate: Provide Road 140 work as indicated on Sheets C7.01 and C7.02.

E. Alternate No. 5: JIB CRANE – MAINTENANCE BUILDING

1. Base Bid: Jib crane not included in the scope of work.
2. Alternate: Provide jib crane as indicated on Sheets Q-1.01 and Q-1.02.

F. Alternate No. 6: LUBRICATION AND FLUIDS DISTRIBUTION SYSTEM – MAINTENANCE BUILDING

1. Base Bid: Provide lubrication and fluids distribution system as indicated on Sheets Q-1.01 and Q-1.02.
2. Alternate: Provide manual lubrication and fluids pumps as indicated on Sheets Q-1.01 and Q-1.02.

G. Alternate No. 7: STUCCO SYSTEM – OPERATIONS BUILDING

1. Base Bid: Provide a 3-coat stucco system exterior finish at the Operations Building per Sheet A-4.21 and as specified in Section 09 24 00 – Cement Plastering (Stucco).
2. Alternate: Provide a 1-coat stucco system exterior finish at the Operations Building per Sheet A-4.21 and as specified in Section 09 24 00 – Cement Plastering (Stucco).

END OF SECTION

SECTION 01 2500

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

SECTION 01 2600

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 2613

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 2900

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 3100

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 3200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 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.

1.02 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.

1.03 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.

1.04 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

2.01 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.

2.02 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.

2.03 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

3.01 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 3300

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 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-06 10 00.01.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 32 00 "Construction Progress Documentation."

F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures.

G. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 40 00 "Quality Requirements."

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."

I. Maintenance Data: Comply with requirements specified in Section 01 78 23 "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 40 00 "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 77 00 "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 4000

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 73 00 "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 4200

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 5000

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 10 00 "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.

C. Electric Power Service: Electric power is available for use at the property Contractor will pay for temporary permit, connection and usage charges. 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: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

I. 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.

J. 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.

K. 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 74 19 "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 73 00 "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 10 00 "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 6000

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 7300

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 7320

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 7419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 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.

1.02 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.

1.03 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of [**50**] [**75**] <**Insert number**> percent by weight of total non-hazardous solid waste generated by the Work. Facilitate recycling and salvage of materials[**.**][**, including the following:**]
1. <**Insert, in separate subparagraphs, materials to be recycled or salvaged**>.

1.04 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within [**7**] [**30**] <**Insert number**> days of date established for [**commencement of the Work**] [**the Notice to Proceed**] [**the Notice of Award**].

1.05 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[**and Credit MR 2.2**], 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.

1.06 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."

1.07 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

3.01 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.[**Coordinator shall be present at Project site full time for duration of Project.**]

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**] <**Insert number**> 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.

3.02 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**]: [**Permitted**] [**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 [**on-site**] [**off-site**] [**designated by Owner**].
5. Protect items from damage during transport and storage.

3.03 RECYCLING [**DEMOLITION**] [**AND**] [**CONSTRUCTION**] WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:
1. <**Insert names and telephone numbers of local recycling receivers and processors of recyclable materials**>.

C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall [**accrue to Owner**] [**accrue to Contractor**] [**be shared equally by Owner and Contractor**].

D. 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.

3.04 RECYCLING DEMOLITION WASTE

A. Asphalt Paving: Grind asphalt to maximum [**1-1/2-inch (38-mm)**] [**4-inch (100-mm)**] size.

B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

1. Pulverize concrete to maximum [**1-1/2-inch (38-mm)**] [**4-inch (100-mm)**] size.

D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
1. Pulverize masonry to maximum [**3/4-inch (19-mm)**] [**1-inch (25-mm)**] [**1-1/2-inch (38-mm)**] [**4-inch (100-mm)**] size.
2. Clean and stack undamaged, whole masonry units on wood pallets.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. 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.

G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

H. 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.

I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.

K. Carpet[**and Pad**]: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
1. Store clean, dry carpet[**and pad**] in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

L. 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.

M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

N. Conduit: Reduce conduit to straight lengths and store by type and size.

3.05 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.

3.06 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.

3.07 SAMPLE FORMS

END OF SECTION

SECTION 01 7700

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 78 39.

C. Owner's Manual: refer to specification 01 78 23.

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

4.1 LIST OF WARRANTIES

A. Schedule: Provide warranties on products and installations.

4.2 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.

(Continued)

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

SECTION 01 7823

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 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 7839

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 7900

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 78 23 "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 4119

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. Qualification Data: For refrigerant recovery technician.

B. Pre-demolition Photographs or Video: Submit before Work begins.

C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

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 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 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.

1.8 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.
   1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."

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.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

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 1512

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 04 Section "Unit Masonry."
3. Division 05 Section "Structural Steel Framing."
4. 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 3000

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 03 Section "Concrete Cure-Sealer-Hardener.”
3. Division 03 Section "Topical Concrete Vapor Control Barrier.”
4. Division 03 Section "Polished and Stained Concrete Finishing” for concrete slabs that are to be polished and stained.
5. Division 07 Section “Underslab Vapor Retarder.”
6. Division 22 and 23 Sections as applicable to Plumbing and Mechanical items embedded in concrete.
7. Division 26 Sections as applicable to Electrical items embedded in concrete.
8. Division 31 Sections as applicable to earthwork.
9. 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 POLYETHYLENE VAPOR RETARDERS

A. Vapor Retarder must have the following qualities:
1. 15 mil thickness minimum
2. WVTR less than 0.008 as tested by ASTM E 96
3. ASTM E 1745 Class A (Plastics)

B. Vapor Retarder Products:
1. Stego Wrap Vapor Retarder by STEGO Industries LLC
2. W.R. Meadows Premoulded Membrane with Plasmatic Core
3. Zero-Perm by Alumiseal

C. Vapor Retarder Tape:
1. Water Vapor Transmission Rate: ASTM E 96, 0.3 perms or lower
2. Minimum 8-mils thick
3. Minimum 3 3/4 inches wide
4. Manufactured from High Density Polyethylene
5. Pressure Sensitive Adhesive

2.3 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.

2.4 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.

2.5 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.

2.6 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).

2.7 VAPOR RETARDERS

A. Sheet Vapor Retarder: As specified in Division 07 Section “Underslab Vapor Retarder,” ASTM E 1745, Class A, 15 mil thickness minimum.

2.8 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.

2.9 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.

2.10 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.

2.11 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.

2.12 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 VAPOR RETARDERS

A. Vapor retarders shall be installed in accordance with the requirements of Division 07 Section "Underslab Vapor Retarder."

3.5 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.

3.6 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.

3.7 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.

3.8 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.

3.9 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.

3.10 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 flooring and similar applications.	Scratch Finish
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.

3.11 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.

3.12 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.

3.13 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.

3.14 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.

3.15 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.

3.16 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.

3.17 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 03 3518

CONCRETE CURE-SEALER-HARDENER

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Single application cure-sealer-hardener for new concrete floors.
2. Single application sealer-hardener for cured concrete floors.
3. Precautions for avoiding staining concrete before and after application.

B. Related Sections:

1. Division 03 Section “Cast-In-Place Concrete.”

1.03 REFERENCES

A. ASTM International (ASTM):

1. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
2. ASTM C779 Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
3. ASTM C805 Standard Test Method for Rebound Number of Hardened Concrete.
4. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
5. ASTM D3359 Standard Test Methods for Measuring Adhesion by Tape Test.
6. ASTM G152 Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials.

1.04 SUBMITTALS

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

B. Qualification Data: For qualified installer.

C. Maintenance Data: Maintenance instructions, including precautions for avoiding staining after application.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is certified in writing by manufacturer as qualified to install manufacturer's products.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

1.06 DELIVERY, STORAGE & HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

C. Handling: Protect materials from dirt, corrosion, oil, grease and other contaminants.

PART 2 - PRODUCTS

2.01 CURE-SEAL-HARDENER

A. Basis of Design: Drawings and Specifications are based on the following:

1. Curecrete Distribution, Inc.; Ashford Formula.

a. Subject to compliance with requirements, submit specified product or a comparable product subject to request for substitution.

B. Cure-Seal-Hardener: Water-based chemically reactive penetrating sealer and hardener that seals by densifying concrete so that water molecules cannot pass through but air and water vapor can, and allows concrete to achieve full compressive strength, minimizing surface crazing and eliminating dusting.

1. Abrasion Resistance to Revolving Disks: At least a 32.5% improvement over untreated samples when tested in accordance with ASTM C779.
2. Surface Adhesion: At least a 22% increase in adhesion for epoxy when tested in accordance with ASTM D3359.
3. Hardening: As follows when tested in accordance with ASTM C39:

a. After 7 Days: An increase of at least 40% over untreated samples.
b. After 28 Days: An increase of at least 38% over untreated samples.

4. Coefficient of Friction: 0.86 dry, 0.69 wet when tested in accordance with ASTM C1028.
5. Rebound Number: An increase of at least 13.3% over untreated samples when tested in accordance with ASTM C805.
6. Light Exposure Degradation: No evidence of adverse effects on treated samples when tested in accordance with ASTM G23.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for conditions affecting performance of the Work of this Section.

B. Proceed with application only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Do not use frozen material. Thaw and agitate prior to use.

D. If construction equipment must be used for application, diaper all components that might drip oil, hydraulic fluid or other liquids.

3.03 INSTALLATION

A. General: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

1. Apply cure-seal-hardener to exposed interior concrete floor slabs indicated to have a sealed concrete finish.

B. New Concrete: Apply cure-seal-hardener to new concrete as soon as the concrete is firm enough to work on after troweling.

1. Spray on at rate of 200 ft^2/gal (5 m^2/L).
2. Keep surface wet with cure-seal-hardener for a minimum soak-in period of 30 minutes without allowing it to dry out or become slippery. In hot weather, slipperiness may appear before the 30 minute time period has elapsed, if slipperiness occurs, apply additional cure-seal-hardener as needed to keep the entire surface in a non-slippery state for the first 15 minutes. For the remaining 15 minutes, mist the surface as needed with water to keep the material in a non-slippery state. In hot weather conditions, follow manufacturer's special application procedures.
3. When the treated surface becomes slippery after this period, lightly mist with water until slipperiness disappears.
4. Wait for surface to become slippery again, and then flush entire surface with water to remove all cure-seal-hardener residue.
5. Squeegee surface completely dry, flushing any remaining slippery areas until no residue remains.
6. Wet vacuum or scrubbing machines may be used in accordance with manufacturer's instructions to remove residue.

C. Existing or Cured Concrete: Apply cure-seal-hardener only to clean bare concrete.

1. Thoroughly remove previous treatments, laitance, oil and other contaminants.
2. Saturate surface with cure-seal-hardener; re-spray or broom excess onto dry spots.
3. Keep surface wet with cure-seal-hardener for a minimum soak-in period of 30 to 40

minutes.

4. If most of the material has been absorbed after the 30 minute soak-in period, remove all excess material, especially from low spots, using broom or squeegee.
5. If most of the material remains on the surface after the 30 minute soak-in period, wait until the surface becomes slippery and then flush with water, removing all cure-seal-hardener residue. Squeegee completely dry, flushing any remaining slippery areas until no residue remains.
6. If water is not available, remove residue using squeegee.

3.04 PROTECTION

A. Protect installed floors for at least 3 months until chemical reaction process is complete.

1. Do not allow traffic on floors for 3 hours after application.
2. Do not allow parking of vehicles on concrete slab.
3. If vehicles must be temporarily parked on slab, place dropcloths under vehicles during entire time parked.
4. Do not allow pipe cutting using pipe cutting machinery on concrete slab.
5. Do not allow temporary placement and storage of steel members on concrete slabs.
6. Clean up spills immediately and spot-treat stains with degreaser or oil emulsifier.
7. Clean floor regularly in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 03 35 43

POLISHED CONCRETE FLOORING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the following:
1. Polished Concrete Flooring.

B. Refer to Division 09 Section – High Performance Coatings for Alternate

1.02 SCOPE

A. The work encompassed by this Section includes performing all operations and furnishing all labor, materials, tools, equipment, and incidentals as necessary to provide Polished Concrete Flooring in areas designated on the drawings.

B. Work to be performed:
1. Dry diamond grinding and polishing of concrete floors.
2. Applying densifying impregnator, sealer and dust-proofing chemicals.
3. Exposing aggregate to approved level.
4. Polishing to specified sheen level.

1.03 RELATED DOCUMENTS

A. Cast-In-Place Concrete: Section 03 30 00.

B. Concrete Floor Sealer: Section 03 35 18.

1.04 ACTION SUBMITTALS

A. Color charts for initial color selection.

B. Samples of color for final selection.

C. On-Site Mock-Up.

1.05 INFORMATIONAL SUBMITTALS

A. Installer's Project References: Submit installer's list of success fully completed polished concrete floor system projects, including project name, location, client and project architect. Define the type of project, quantity of area polished concrete flooring and system used.

B. Project Record Drawings

C. Product Data for each product specified including the following: Test Reports: Provide certified test reports, prepared by an independent testing laboratory, confirming compliance with specified performance criteria.
1. Submit special concrete finishes manufacturer's specifications and test data.

2. Submit special concrete finishes describing product to be provided, giving manufacturer's name and product name for the specified material proposed to be provided under this section.
3. Submit special concrete finishes manufacturer's recommended installation procedures; which when approved by the Architect, will become the basis for accepting or rejecting actual installation procedure used on the work.
4. Submit special concrete finishes technical data sheet giving descriptive data, curing time, and application requirements.
5. Submit special concrete finishes manufacturer's Material Safety Data Sheet (MSDS) and other safety requirements.
6. Follow all special concrete finishes published manufacturer's installation instructions.

D. Installation instructions.

E. Maintenance Data: Submit installer's maintenance manual, including maintenance and cleaning instructions.

1.06 QUALITY ASSURANCE

A. American Society for Testing and Materials:
1. ASTM C642: Standard Test Method for Density, Absorption, and Voids in Hardened Concrete.
2. ASTM D5178: Standard Test Method for Mar Resistance of Organic Coatings.
3. ASTM D4060: Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abrasion: Modified.
4. ASTM G154-129: Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.
5. ASTM D4541-09e1: Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
6. ASTM D2369-10e1: Standard Test Method for Volatile Content of Coatings.
7. ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
8. ASTM C1378: Standard Test Method for Determination of Resistance to Staining.
9. ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
10. ASTM C150: Standard Specification for Portland Cement.
11. ASTM C33: Standard Specification for Concrete Aggregates.
12. ASTM D523: Test Method for Specular Gloss of Emulsion Floor Polish.
13. ASTM D1455-87: Standard Test Method for 60° Specular Gloss of Emulsion Floor Polish.
14. ASTM E1155-95: Standard Test Method for Determining Floor Flatness and Floor Levelness Numbers.

B. American Concrete Institute:
1. ACI 302.1R, Guide for Concrete Floor and Slab Construction.

C. Other Test: Reflectivity according to use of Horiba IG-320 Gloss Checker.

D. Installer Qualifications:
1. Use an experienced installer and adequate number of skilled workmen which are thoroughly trained and experienced in the necessary craft.
2. The special concrete finish manufacturer shall certify applicator.

3. Applicator shall be familiar with the specified requirements and the methods needed for proper performance of work of this section.

E. Manufacturer's Certification:
1. Provide letter of certification from concrete finish manufacturer stating that installer is certified applicator of special concrete finishes, and is familiar with proper procedures and installation requirements required by the manufacturer.

F. Mock-ups:
1. Apply mock-ups of each type finish, to demonstrate typical joints, surface finish, color variation (if any) crack repair, and standard of workmanship.
2. Notify Architect or State Representative seven days in advance of dates and times when mockups will be constructed.
3. Obtain from the Architect or State Representative approval of mock-ups before starting construction.
4. If the Architect or State Representative determines that mock-ups do not meet requirements, demolish and remove them from the site if instructed to do so and cast others until mock-ups are approved.
5. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work.
6. State approved mock-ups may become part of the completed work if undisturbed at time of acceptance of the work.

G. Protection:
1. No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential.
2. All hydraulic powered equipment must be diapered to avoid staining of the concrete.
3. No trade will park vehicles on the inside slab. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
4. No pipe cutting machine shall be used on the inside floor slab.
5. Steel shall not be placed on interior slab to avoid rust staining.
6. Acids and acidic detergents shall not come into contact with slab
7. All trades shall be informed that the slab must be protected at all times.
8. All equipment must be equipped with non-marking tires.
9. Provide protective covering such as "SKUDO" or equivalent.

1.07 PRE-INSTALLATION CONFERENCE

A. Conduct conference at project site.
1. Notes of conference will be distributed to all attendees.

1.08 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions. Keep materials from freezing.

C. Handling: Protect materials during handling and application to prevent contamination or damage.

1.09 WARRANTY

A. Provide a 10 year dustproof warranty from the CMR that finished the polished concrete floor. Warranty to include on-site training of Owner's cleaning personnel, maintenance guidelines for daily cleaning, and customer service 24/7 direct call access.

PART 2 - PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Polished Concrete: Includes grinding installation of silicate sealer, (hardener, densifier), polishing, and a stain repellant.

B. Performance Criteria:
1. ASTM C642 Absorbability: Reduction of 75% of Control.
2. ASTM D5178 Balance Beam Mar Tester: Greater than 50 percent harder.
3. ASTM D2486e1 Abrasive Scrub: 1200 Cycles.
4. ASTM D4060 Modified Taber Abrasion 600 Rev: 0.37 percent treated vs. 0.68 percent untreated.
5. ASTM G154-12a: 5000 HR QUV: No fade, change or erosion.
6. ASTM D4541-09e1 Bonding: Greater than 50 psi.
7. ASTM D2369-10e1 Solids: 18 percent minimum.
8. Reflectivity: Change in gloss to 30, 60 or 80 depending on Certi-Shine system, as measured using a gloss meter in accordance with Horiba IG-320 Gloss Checker.
9. ASTM C1378-04 Stain resistance: Food, chemical, oil and common stain resistance. See manufacturer's literature for list.

2.02 MATERIALS

A. Manufacturers:
1. L.M. Scofield Company, a Sika Company
2. QuestMark, a Division of CentiMark Corporation.
3. W.R. Meadows, Inc.
4. Or approved equal.

PART 3 - EXECUTION

3.01 PROJECT CONDITION

A. Floor Finish:
1. Slabs and flatwork shall be placed and finished monolithically.
2. Strike off and laser screed slabs to true, plane surfaces at required elevations.
3. Thoroughly compact concrete with vibrators, floats, and tampers to force coarse aggregate below the surface.
4. Power trowel with no hand finishing.
5. Pan float.
6. Steel finish.
7. Surface should not be burned due to excessive troweling.
8. Imprints are not acceptable (i.e. boots, foreign objects dropped into concrete).

B. Floor and Joints:
1. Free of debris and excessive dirt, dust, clay, and mud.
2. Dry.

C. Floor Surface Profile:
   1. Floor Flatness Number (FF): 50 (preferred) 45 (minimum).
   2. Floor Levelness Number (FL): 35 (preferred) 30 (minimum).

D. Concrete Compressive Strength: As noted on construction documents.

E. Concrete Curing: Minimum 8 days water cured or dissipating curing compound applied.

F. Concrete Adjacent to Floor Penetrations: Troweled flat and level with surrounding concrete.

G. Concrete Adjacent to drains, clean-outs, etc: Finish level to the top of the structure.

3.02 SURFACE PREPARATION

A. Protect surrounding areas and adjacent surfaces from the following:
   1. Minimal accumulation of dust from grinding and polishing
   2. Contact with overspray of concrete densifier.
   3. Contact with overspray of concrete sealer.

B. Prepare surfaces in accordance with installer's instructions.

C. Clean Surfaces: Remove dirt, dust, debris, oil, grease, curing agents, bond breakers, paint, coatings, and other surface contaminants which could adversely affect installation of polished concrete floor system.

3.03 INSTALLATION

A. Install polished concrete floor system in accordance with installer's instructions.

B. Start floor finish applications in presence of manufacturer's technical representative if practical.

C. Aggregate Exposure: Small Aggregate; mottled salt-and-pepper course aggregate exposure.

D. Polished Concrete Finish: Level 3 – High Gloss.

3.04 APPLICATION

A. Level floor by grinding with 40-grit metal-bonded diamonds (Note: The exact number of grinding and polishing steps required will be determined by the flatness achieved by the concrete finisher, along with the desired look that is specified).

B. Prepare concrete to accept densifier by grinding with 80-grit metal-bonded diamonds.
   1. Apply concrete densifier to deeply saturate floor.
   2. Remove residue of concrete densifier dried on floor surface by grinding with 150-grit metal-bonded diamonds.

C. Polishing:
   1. Remove 150-grit metal-bonded diamond scratches by grinding with 100-grit resin-bonded diamonds.

2. Remove 150-grit metal-bonded and 100-grit resin-bonded diamond scratches by grinding with 200-grit resin-bonded diamonds.
3. Prepare floor for polishing by grinding with 400-grit resin bonded diamonds.
4. Achieve light-reflective finish when viewed from a distance of 30 feet by grinding with 800-grit resin-bonded diamond.

D. Sealing, Hardening and Polishing of Concrete Surface
1. Concrete must be in place a minimum of 28 days or as directed by the manufacturer before application can begin.
2. Polish to pre-determined level based on test sample.
3. Application is to take place at least 10 days prior to racking and other in-store accessory installation, thus providing a complete, uninhibited concrete slab for application.
4. Applicable procedures must be followed as recommended by the product manufacturer and as required to match approved test sample.
5. Achieve hardening, dust-proofing, and abrasion resistance of the surface without changing the natural appearance of the concrete, except for the sheen.
6. Finish to within 3 inches of vertical surfaces where practical.

3.05 QUALITY CONTROL

A. Inspect completed polished concrete floor system with CMR, Architect, and the State.

B. Review procedures with Architect to correct unacceptable areas of completed polished concrete floor system.

C. Testing: Test the following from completed polished concrete floor system.
1. Static Coefficient of Friction:
a. Dry surface.
b. Wet surface.

D. Specular Gloss/Reflectance (Test Test Method for Specular Gloss of Emulsion Floor Polish):
1. 20 degrees.
2. 60 degrees.

E. Floor Surface Profiles:
1. Floor Flatness Number (FF).
2. Floor Levelness Number (FL).

F. Test Results:
1. Report test results in writing to CMR, Architect and the State within 24 hours after tests.
2. Compare test results from tests performed before and after installation of polished concrete floor system.

3.06 PROTECTION

A. Protect completed polished concrete floor system from damage until acceptance of the work.
1. Do not allow vehicle and pedestrian traffic on unprotected floor.
2. Do not allow construction materials, equipment, and tools on unprotected floor.

B. Immediately remove mortar splatter, spilled liquids, oil, grease, paint, coatings, and other surface contaminants which could adversely affect completed polished concrete floor system.

C. Repair damaged areas of completed polished concrete floor system to satisfaction of Architect.

END OF SECTION

SECTION 03 3910

TOPICAL CONCRETE VAPOR CONTROL BARRIER

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes surface applied penetrating moisture barrier treatments for newly poured concrete slabs on grade.

B. Related Sections:

1. Division 03 Section "Cast-in-Place Concrete" for concrete mixtures, placement, and finishing.
2. Division 09 Section "Flooring Moisture and Alkalinity Testing" for concrete slab moisture and alkalinity testing.
3. Division 09 Sections as applicable to adhered floor systems.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated, include manufacturer's specification data, installation instructions, and statement of VOC content.

B. Reports: Laboratory test reports.

C. Digital Photographs: Digital photography of completed installation, including surface preparation of concrete slabs.

D. Qualification Data: For qualified Applicator.

E. Field quality-control reports by manufacturer's technical representative.

F. Warranty: Special warranty specified in this Section.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: An employer of workers trained and approved by manufacturer.

B. Preinstallation Conference: Conduct conference at Project site.

1.05 PROJECT CONDITIONS

A. Limitations: Proceed with application only when existing and forecasted weather and substrate conditions permit product to be applied according to manufacturers' written instructions and warranty requirements.

1. Do not apply when concrete surface temperatures are below 40 degrees F or above 90 degrees F; concrete surface temperatures shall not exceed these limits prior, during and after application for 48 hours.
2. Do not apply products to unprotected surfaces or when water has accumulated on the surface of the concrete.
3. Allow continuous ventilation and indirect air movement during application and curing process.

1.06 COORDINATION

A. Coordinate with Work of the following Sections:

1. Division 03 Section “Cast-in-Place Concrete:”

a. Review concrete mixture design; water/cement ratio shall not exceed 0.44 for concrete slabs on grade.
b. Review finishing of concrete slabs; slabs shall be finished as specified by topical vapor control barrier manufacturer.

2. Division 07 Section “Underslab Vapor Retarder:” Concrete slabs-on-grade shall be poured directly over a vapor barrier complying with ASTM E1745, Class A requirements and having a permeance rating not exceeding 0.025 Perms per ASTM E96.

3. Division 09 Section “Flooring Moisture and Alkalinity Testing:” Review and coordinate preparation of concrete slabs on grade with testing requirements and preparation procedures.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree to repair or replace materials that fail to maintain requirements specified in "Performance Requirements" Article within specified warranty period.

1. In the event floor coverings are damaged due to failure of products or application of products specified in this Section and independent testing results verify water vapor emission and/or alkalinity values in excess of the limits specified, manufacturer and installer shall repair or replace barrier, floor coverings, wall base, adhesives, and patching compounds at no cost to Owner. Warranty shall not list upper moisture or alkalinity levels. Warranty shall not exclude cracks, concrete cohesive failure, ACI 318, ACI 201, dew point, concrete salts or silicates contamination.

B. Warranty Period: Fifteen (15) years from date of Substantial Completion.

C. Liability Insurance: Manufacturer shall provide product liability insurance in the amount of one million dollars ($1,000,000) per occurrence, listing Architect and Owner as additional insured. Sub-contractor general liability certificates are not acceptable.

PART 2 - PRODUCTS

2.01 TOPICAL CONCRETE VAPOR CONTROL BARRIERS FOR NEW CONCRETE

A. Description: Two-Component, spray applied product for application to newly poured concrete slabs on grade during final troweling process and designed to suppress water vapor emission, alkalinity, and relative humidity rates from concrete. Material shall be a polymer (non-silicate) based penetrating, film forming barrier that remains compatible with flooring adhesives.

1. Basis of Design: Drawings and specifications are based on the following:

a. Synthetics International; Synthetic 10TR.

1) Subject to compliance with requirements, provide the product indicated or an equivalent product subject to request for substitution.

2. Performance Requirements: Applied product systems shall meet performance requirements indicated without failure due to defective manufacture or installation.

a. Relative Humidity: Suppress 100 percent relative humidity in accordance with ASTM F2170.
b. Water Vapor Transmission Rate (WRT), ASTM E96:

1) Grains/sf/hour: 0.60 to 1.0 or less.
2) Pounds/1,000 sf/24 hours: 2.0 to 3.3 or less.
3) Grams/hour per square meter: 0.40 to 0.70 or less.

c. Water Vapor Permeance (WVP), ASTM E96:

1) Perm (inch-pound): 1.4 to 2.4.
2) Grams/Pa s m2 x 10 (-8): 8.1 to 13.6.
3) Nanograms/Pa s m2: 81.1 to 136.3.

d. Vapor Emission Testing, ASTM F 1869: Not more than 3 lbs.
e. Alkali Resistance, ASTM D1308: 100% resistant to 30 day exposure to 14 pH and 35% potassium hydroxide resistant.
f. Alkalinity Control: Suppress 14 pH without damage per ASTM F710.
g. Concrete Adhesion: 100% concrete cohesive failure in accordance with ASTM FD4541 pull-off adhesion tester.

3. Physical Properties:

a. Product Type: Water based.
b. Product Color: White, dries clear.
c. Solids Content: 37 percent by volume.
d. Thickness: 4 to 6 mills, WFT.
e. Material Mixture: Two-component.
f. Number of Coats: Two coat application.
g. Spread Rate: 250 to 350 square feet per gallon per coat.
h. Flooring Ready: 7 days.
i. Foot Traffic: 10 to 12 hours.
j. Product Odor: Slight odor.
k. Environmental: Non-corrosive, water based, water clean up product.

l. Product passes the California Department of Health Services Section 01650 Toxic VOC testing.
m. Product shall mix easily with concrete cement paste.
n. Product is not classified as a marine pollutant.
o. Product shall not contain hazardous air pollutants.
p. Volatile Organic Compounds (VOC) Content: 35 g/liter per EPA Method 24.

2.02 TOPICAL CONCRETE VAPOR CONTROL BARRIERS FOR EXISTING CONCRETE

A. Description: Liquid applied, two-component epoxy based product for application to properly prepared existing concrete slabs on grade and designed to suppress water vapor emission, alkalinity, and relative humidity rates from concrete. Material shall be a polymer (non-silicate) based penetrating, film forming barrier that remains compatible with flooring adhesives.

1. Basis of Design: Drawings and specifications are based on the following:

a. Synthetics International; Synthetic 30.

1) Subject to compliance with requirements, provide the product indicated or an equivalent product by one of the following:

a) Diamond Stone Products.
b) Ardex Moisture Control.

2. Performance Requirements: Applied product systems shall meet performance requirements indicated without failure due to defective manufacture or installation.

a. Relative Humidity: Suppress 100 percent relative humidity in accordance with ASTM F2170.
b. Water Vapor Transmission Rate (WRT), ASTM E96:

1) Grains/sf/hour: 0.60 to 1.0 or less.
2) Pounds/1,000 sf/24 hours: 2.0 to 3.3 or less.
3) Grams/hour per square meter: 0.40 to 0.70 or less.

c. Water Vapor Permeance (WVP), ASTM E96:

1) Perm (inch-pound): 1.4 to 2.4.
2) Grams/Pa s m2 x 10 (-8): 8.1 to 13.6.
3) Nanograms/Pa s m2: 81.1 to 136.3.

d. Vapor Emission Testing, ASTM F 1869: Not more than 3 lbs.
e. Alkali Resistance, ASTM D1308: 100% resistant to 30 day exposure to 14 pH and 35% potassium hydroxide resistant.
f. Alkalinity Control: Suppress 14 pH without damage per ASTM F710.
g. Concrete Adhesion: 100% concrete cohesive failure in accordance with ASTM FD4541 pull-off adhesion tester.

3. Physical Properties:

a. Product Type: Water based epoxy.
b. Product Color: Clear or white.
c. Solids Content: 40 to 50 percent by volume.
d. Thickness: 6 - 10 mills, DFT.

e. Material Mixture: Two-component.
f. Number of Coats: Two coat application.
g. Spread Rate: 250 square feet per gallon per coat.
h. Flooring Ready: 24 to 48 hours.
i. Foot Traffic: 10 to 12 hours.
j. Product Odor: Slight odor.
k. Environmental: Non-corrosive, water based, water clean up product.
l. Product passes the California Department of Health Services Section 01650 Toxic VOC testing.
m. Product is non-corrosive, non-combustible, non-flammable, and non-hazardous to installers.
n. Product is not classified as a marine pollutant.
o. Volatile Organic Compounds (VOC) Content: 35 to 65 g/liter per EPA Method 24.

4. Product shall be primed and coated with a 1/8 inch thick cementitious topcoat.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Review approved concrete mix design and examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 COORDINATION

A. Coordinate slab finish of new concrete slabs with Division 03 Section “Cast-in-Place Concrete.” New concrete slabs are to be finished with a light broom finish or prepared in accordance with requirements for existing concrete slabs.

3.03 APPLICATION, GENERAL:

A. Manufacturer's Field Service Representative: Engage a factory-authorized service representative to inspect the substrate before application of surface treatment, to instruct Applicator on the product and application method to be used, and to supervise the product application.

B. Areas of Application: Apply topical concrete vapor control barrier to surfaces of concrete slabs-on-grade that are scheduled to receive adhered flooring products.

3.04 APPLICATION TO FRESH CONCRETE

A. Topical concrete vapor control barrier shall be applied in replacement of standard curing, sealing and hardening compounds.

B. Mix and apply product in accordance with manufacturer’s written installation instructions.

C. Apply topical concrete vapor control barrier to concrete surfaces when final power troweling of concrete is to begin. Apply by electric sprayer and provide even coverage over entire substrate.

1. Apply 1 coat at a spread rate of 250 to 350 sf/gallon for each coat.
2. Where concrete slab areas are inaccessible to power trowel equipment, apply one coat at the beginning of hand troweling operations.

D. Protect from walking traffic for 12 hours and heavy traffic for 36 hours.

3.05 APPLICATION TO EXISTING CONCRETE

A. Preparation of Existing Concrete Slabs: Before application of surface treatment, clean substrate of substances that could impair penetration or performance of product according to manufacturer's written instructions and as follows:

1. Remove oil, curing compounds, laitance, and other substances that inhibit penetration or performance of water repellents.
2. Use a high volume blower to remove surface sand and dirt and/or rinse with clean water to remove debris. Proceed with application when concrete surface is clean and dry.
3. Surfaces shall be clean and free of mud, dirt and contamination for other trades.
4. Shot blast floors to an ICRI # 4 using #420 shot and grind near edges.

B. Mix and apply product in accordance with manufacturer's written installation instructions.

C. Crack and Joint Treatment: Seal all cracks and joints with product during initial application.

D. Apply topical concrete vapor control barrier by electric sprayer and/or roller, spread evenly over entire substrate, cracks, joints and penetrations by flat squeegee and back roll with lint free nap roller.

1. Apply two coats at a spread rate of 250 sf/gallon per coat.

E. Apply manufacturer's approved primer and a nominal 1/8 inch cementitious topcoat over all barrier surfaces.

1. Cementitious topcoat is required for warranty extension for future flooring updates by Owner.

F. Protect from walking traffic for 12 hours and heavy traffic for 36 hours.

3.06 FIELD QUALITY CONTROL

A. Building shall be acclimated to the working environment of the Owner for not less than 2 weeks prior to field quality control testing.

B. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and prepare test reports directly on control barriers surface.

C. Testing shall be as specified in Division 09 Section “Flooring Moisture and Alkalinity Testing.” Testing shall be performed after curing of concrete an vapor control system and shall include the following tests:

1. Moisture vapor emission, ASTM F 1869.

2. Relative Humidity, ASTM F 2170.
3. Alkalinity-pH, ASTM F710.

D. Prior to testing, do not sand or grind concrete surfaces that have applied topical concrete vapor control barriers.

E. Test results shall be forwarded to the manufacturer for warranty registration.

F. Treated areas having a vapor emissions rate exceeding flooring product requirements for moisture and pH-Alkalinity shall be resealed at no additional cost to the owner.

3.07 CLEANING, PROTECTION, AND REPAIR

A. Immediately clean product from adjoining surfaces and surfaces soiled or damaged by application as work progresses. Correct damage to work of other trades caused by application.

B. Comply with manufacturer's written cleaning instructions.

C. Do not allow foot or wheel traffic after application for time periods recommended in writing by manufacturer.

D. Repair areas damaged during construction to allow a curing time of approximately 5 days prior to installing floor coverings.

END OF SECTION

SECTION 04 2200

CONCRETE UNIT MASONRY

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. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units (CMUs).
2. Decorative concrete masonry units.
3. Mortar and grout.
4. Reinforcing steel.
5. Miscellaneous masonry accessories.

B. Related Sections include the following:

1. Division 03 Section “Cast-in-Place Concrete” for footings for masonry walls.
2. Division 07 Section “Water Repellents” for surface applied water repellents.
3. Division 07 Section “Joint Sealants” for sealants for masonry wall control joints.
4. Division 09 Section “Painting” for water repellents applied to unit masonry assemblies.

1.3 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths (f'_m) at 28 days.

1. Determine net-area compressive strength (f'_m) of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602 and Table 2105.2.2.1.2 of the California Building Code.

1.4 SUBMITTALS

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

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.

C. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:

1. Masonry units.

   a. Include material test reports substantiating compliance with requirements.
   b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Pre-blended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.
5. Reinforcing bars.
6. Joint reinforcement.
7. Anchors, ties, and metal accessories.

D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports, per ASTM C 780 for mortar mixes required to comply with property specification.
2. Include test reports, per ASTM C 1019 for grout mixes required to comply with compressive strength requirement.

E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.5 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.

C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Sections applicable to project meetings.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns,

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 and Section 2104A.3 in the California Building Code.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 and Section 2104A.4 in the California Building Code.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.2 CONCRETE MASONRY UNITS (CMUs)

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners, unless otherwise indicated.

B. Integral Water Repellent: Provide units made with integral water repellent for units exposed to the exterior.

1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514 as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

a. Products: Subject to compliance with requirements, provide one of the following:

1) ACM Chemistries; RainBloc.
2) BASF Construction Chemicals – Construction Systems; MasterPel 240.
3) Grace Construction Products; W.R. Grace & Co.; Dry-Block.

C. Concrete Masonry Units: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
2. Weight Classification: Medium weight.
3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

a. 8 x 8 x 16 inch nominal, 7 5/8 x 7 5/8 x 15 5/8 inch actual.

4. Exposed Faces: Precision face.
5. Color: Manufacturer’s standard gray.

D. Decorative Concrete Masonry Units: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
2. Weight Classification: Medium weight.
3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

a. 8 x 8 x 16 inch nominal, 7 5/8 x 7 5/8 x 15 5/8 inch actual.

4. Pattern and Texture:

a. Standard pattern, ground face finish.
b. Standard pattern, split face finish.

5. Colors: As selected by Architect from manufacturer's full range.

2.3 LINTELS

A. Masonry Lintels: Built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.

D. Masonry Cement: ASTM C 91.

E. Mortar Cement: ASTM C 1329.

F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Davis Colors; True Tone Mortar Colors.
b. Approved equivalent.

G. Colored Cement Product: Packaged blend made from portland cement and lime, masonry cement, or mortar cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
2. Pigments shall not exceed 10 percent of portland cement by weight.
3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
4. Products:

a. Colored Portland Cement-Lime Mix:

1) Capital Materials Corporation; Riverton Portland Cement Lime Custom Color.
2) Holcim (US) Inc.; Rainbow Mortamix Custom Color Cement/Lime.

3) Lafarge North America Inc.; Eaglebond.
4) Lehigh Cement Company; Lehigh Custom Color Portland/Lime Cement.
5) Or approved equal.

b. Colored Masonry Cement:

1) Capital Materials Corporation; Flamingo Color Masonry Cement.
2) Essroc, Italcementi Group; Brixment-in-Color.
3) Holcim (US) Inc.; Rainbow Mortamix Custom Color Masonry Cement.
4) Lafarge North America Inc.; Florida Custom Color Masonry or Magnolia Masonry Cement.
5) Lehigh Cement Company; Lehigh Custom Color Masonry Cement.
6) National Cement Company, Inc.; Coosa Masonry Cement.
7) Or approved equal.

c. Colored Mortar Cement:

1) Lafarge North America Inc.; Magnolia Superbond Mortar Cement.
2) Or approved equal.

H. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

I. Aggregate for Grout: ASTM C 404.

J. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent; admixture shall be the same product used for the manufacturer of integral water repellant concrete masonry units, confirm product used with concrete masonry unit manufacturer.

K. Water: Potable.

2.5 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 and as indicated on the Drawings.

2.6 MISCELLANEOUS ANCHORS

A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of shape and dimensions indicated.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.8 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, provide one of the following:

   a. Diedrich Technologies, Inc.
   b. EaCo Chem, Inc.
   c. ProSoCo, Inc.
   d. Approved equivalent.

2.9 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
3. Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement, mortar cement, and lime.
4. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry. See Structural Drawing.

1. For masonry below grade or in contact with earth, use Type S.
2. For reinforced masonry, use Type S.
3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.

4. For interior non-load-bearing partitions, Type O may be used instead of Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
2. Mix to match Architect's sample.

E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

1. Mix to match Architect's sample.

F. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 10 inches as measured according to ASTM C 143/C 143M or with slump as indicated on Drawings.

2.10 SOURCE QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform source quality-control testing indicated below:

1. Payment for these services will be made by Owner.
2. Retesting of materials failing to comply with specified requirements shall be done at Contractor's expense.

B. Concrete Masonry Unit Test: For each type of unit furnished, per ASTM C 140.

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 work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Tolerances: Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:

1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
2. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
3. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.
6. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.3 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

A. Lay concrete masonry units as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

1. Tool exterior joints with a horizontal rake.

C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.5 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

1. Locate joints as indicated on Drawings.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.

3.6 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602, Section 2104A.5 in the California Building Code.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602, Section 2104A.5 in the California Building Code for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 48 inches.
3. High lift grouting shall only be allowed with prior written approval by the enforcing agency.

3.7 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 masonry 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 test specimens on the project site.

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 1705.4, TMS 402-11, ACI 530-11, ASCE 5-11 Table 1.19.2 (Level B).
3. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
4. Place grout only after inspectors has verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
5. Place grout only after inspectors have verified proportions of site-prepared grout.

E. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

F. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.

G. Mortar Test (Property Specification): For each mix provided, per ASTM C 780. Test mortar for mortar air content and compressive strength.

H. Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.

I. Additional testing and inspecting will be performed to determine compliance of replaced or additional work with specified requirements.

1. 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.

3.8 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.9 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION

SECTION 05 1200

STRUCTURAL STEEL FRAMING

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. Structural steel.
2. Grout.

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 05 Section "Architecturally Exposed Structural Steel Framing" for additional requirements for architecturally exposed structural steel.
3. Division 05 Section "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.
4. Division 13 Section "Metal Building Systems" for structural steel.

1.3 REFERENCED CODES AND STANDARDS

A. Comply with pertinent provisions of the following codes and standards:

1. California Code of Regulations, Title 24, Part 2, California Building Code, 2013 Edition.
2. American Institute of Steel Construction (AISC) Publications:

a. Code of Standard Practice for Steel Buildings and Bridges, April 14, 2010 (AISC 303-10).
b. Quality Criteria and Inspection Standards, latest Edition.
c. Manual of Steel Construction, 14th Edition.
d. Specification for Structural Steel Buildings, June 22, 2010 (AISC 360-10).
e. Seismic Provisions for Structural Steel Buildings including Supplement No. 1, March 9, 2010 and November 16, 2010 respectively (AISC 341-10).

3. American Welding Society (AWS):

a. D1.1-10 Structural Welding Code - Steel.
b. D1.8-09 Structural Welding Code – Seismic

4. Steel Structures Painting Council (SSPC):

a. Steel Structures Painting Manual, Vol. 2, Systems and Specifications, latest edition.

5. Federal Specifications:

a. FF-W-84A, Washers, Lock (Spring).

6. Research Council on Structural Connections of the Engineering Foundation (RCSC):

a. CRD-C621 Non-Shrink Grouts.
b. Specification for structural joints using ASTM A325 or A490 Bolts, December 31, 2009.

1.4 SUBMITTALS

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

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

C. Qualification Data: For fabricator and installer.

D. Welding certificates.

E. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

F. Certified mill test reports for structural steel, including chemical and physical properties.

G. Source quality-control reports.

H. Affidavit signed by the fabricator stating the structural steel furnished meets the requirements of the grade specified.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator who employs adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. The Fabricator shall have completed a project of similar size and scope, and shall have adequate facilities, personnel, and equipment to meet production and quality requirements to maintain proper job progress. Certification by the AISC Quality Certification Program will provide satisfactory evidence of compliance.

B. Installer Qualifications: A qualified installer who employs adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely

familiar with the specified requirements and the methods needed for proper performance of the work of this Section. Certification by the AISC Quality Certification Program will provide satisfactory evidence of compliance.

C. Contractor Qualifications: The Contractor shall have completed a project of similar scope and shall have adequate facilities, personnel, and equipment to meet production and quality requirements to maintain proper job progress. Certification by the AISC Quality Certification Program will provide satisfactory evidence of compliance.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel" and AWS D1.8/D1.8M, “Structural Welding Code – Seismic Supplement.”

E. Identification of Structural Steel: The fabricator shall maintain the identity of the material and shall maintain suitable procedures and records attesting that the specified grade has been furnished, in compliance with AISC 360 and 2013 CBC Section 2203.1 (CBC 2203A.1 for projects governed by the Division of the State Architect).

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.7 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992.

1. For shapes that are part of the lateral force resisting system with flange thickness exceeding 1-1/2 inches and other shapes with flange thickness exceeding 2 inches, conform to the Supplementary Requirements of ASTM A6.

    a. S30, Charpy V-Notch Impact Test for structural shapes: Alternate core location. Test to minimum average value of toughness of 20 ft-lb at 70°F.

B. Plate, Bar, Channels, and Angles: ASTM A 36 (A572 when specified).

1. For plate 2 inches and thicker, conform to the Supplementary Requirements of ASTM A6.

    a. S5, Charpy V-Notch Impact Test. Test to minimum average value of toughness of 20 ft-lb at 70°F.

C. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.

D. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.

1. Weight Class: Standard unless otherwise indicated on Drawings.
2. Finish: Black except where indicated to be galvanized.

E. Welding Electrodes: Comply with AWS requirements, electrodes shall be compatible with the base material being welded. For welds designated as demand critical as part of the lateral force resisting system, filler metal shall have Charpy V-Notch rating per AISC 341. For filler metals used in combination with filler metals of different processes, provide certification of Charpy V-Notch compatibility per AISC 341 and AWS D1.8.

1. Shielded Metal Arc Welding: AWS A5.1, E70XX.
2. Submerged Arc Welding: AWS A5.17, E7X.
3. Self-Shielded flux core - NR 233.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. General: Provide hot dip zinc coated fasteners for exterior locations.

B. Bolts and Nuts:

1. General Use: Regular hexagon head type, ASTM A307, Grade A.
2. High Strength: Where high strength bolting is noted on drawings, bolts and nuts shall conform to following:

    a. Bolts: ASTM A325, Type 1 or 2.
    b. Nuts: ASTM C563.

C. Anchor Rods, Anchor Bolts, and Nuts:

1. General Use: ASTM F1554, Grade 36 (36ksi).
2. High Strength: ASTM F1554, Grade 55 (55ksi) with Supplementary Requirement No. 1 or Grade 105 (105ksi) where specified.
3. Provide color coding per ASTM F1554 at each exposed end of anchor rods.

D. Washers: Washers shall be suitable for use intended and as follows:

1. Circular washers shall be flat and smooth and conform to the requirements of ANSI B18.22.1, Type A.
2. Washers for high strength bolts shall conform to ASTM F436.
3. Plate Washers shall conform to the requirements of ASTM A36
4. Beveled washers for American Standard beams and channels shall be square or rectangular, shall taper in thickness and shall be smooth.
5. Lock washers shall conform to FF-W-84.

E. Welded Studs, Connectors, and Anchors: ASTM A 108, Grades 1015 through 1020, AWS D1.1.

1. Threaded Studs: Nelson type CPL threaded studs.
2. Shear Connectors: Nelson type S3L shear connector studs.
3. Deformed bar anchors: Nelson D2L deformed bar anchors.
4. Concrete Anchors: Nelson H4L concrete anchors.

F. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

G. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

2.3 PRIMER

A. Primer: Fabricator's standard lead free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanizing Repair Paint: ASTM A 780.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time, and having the following characteristics:

1. Be capable of producing a flowable grouting material having no drying shrinkage or settlement at any age.
2. Compressive strength of grout (2 inch cubes) shall be not less than 5,000 psi at age seven days and 7,500 psi at age 28 days.
3. Conform to Corps of Engineers CRD-C621.

B. Dry Pack Grout: 2 parts sand to 1 part cement.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303 "Code of Standard Practice for Steel Buildings and Bridges," AISC 360 “Specification for Structural Steel Buildings,” and AISC 341 “Seismic Provisions for Structural Steel Buildings including Supplement No. 1.”

1. Camber structural-steel members where indicated.

a. Camber horizontal members in accordance with AISC 360 Spec. Section M2. Do not use purely mechanical means to reverse over cambered beams.

2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
2. Thermal cutting will be permitted only with the specific approval of the Architect.
3. Stresses shall not be transmitted through thermally cut surfaces unless such surfaces are cut by a mechanically guided torch.
4. The radius of re-entrant flame cut fillets shall be as large as possible, but never less than one-half inch.
5. All Thermal cutting shall be smooth and regular in contour per AWS.
6. The net area of thermally cut members shall be determined by deducting one-eighth inch from the cut edges not made by a mechanically guided torch.

C. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Holes: Cut holes perpendicular to steel surfaces by cutting, drilling, or punching holes, do not thermally cut bolt holes or enlarge holes by burning.
2. Weld threaded nuts to framing and other specialty items indicated to receive other work.
3. Remove outside burrs resulting from drilling or reaming operations with a tool making a 1/16 inch radius.
4. Make bolt holes 1/16 inch oversize typical. Anchor bolt holes in column base plates shall be oversized per drawings..

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Welded Construction:

1. The location and type of all welds shall be as shown on the drawings. No weld splices shall be made except as shown.
2. All welds shall be made by the electric shielded arc or the submerged-arc methods. The welding sequence and technique of welding shall be carefully controlled to minimize locked-up stresses and distortion.
3. Visible welded joints shall be considered "finished" welds and shall be carefully executed to preclude the necessity of grinding or otherwise finishing. However, when the appearance of the weld is unacceptable, in the opinion of the Architect, grinding shall be of the highest standard for both field and shop practice.

F. Cleaning: Clean and prepare steel surfaces that are to remain unpainted as follows:

1. Remove oil, grease, and similar contaminants in accordance with SSPC-SP-1.
2. Clean off heavy rust and loose mill scale in accordance with SSPC-SP-2 or SSPC-SP-3.

G. Welded Threaded Studs, Shear Connectors, and Concrete Anchors: Prepare steel surfaces and automatically end weld studs and concrete anchors in accordance with AWS D1.1/D1.1M

and the manufacturer's recommendations in such a manner as to provide complete fusion between the end of the stud and the plate. There should be no porosity or evidence of lack of fusion between the welded end of the stud and the plate. The stud shall decrease in length during welding approximately 1/8 inch for studs up to 5/8 inch in diameter, and approximately 3/16" in length for studs over 5/8 inch diameter.

2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified. Each member of the bolting crew applying high strength bolts shall be assigned an identification mark or symbol which shall be applied to each joint worked.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work. In addition, comply with AWS D1.8/D1.8M for “High Seismic Applications” as defined in AISC 360 where applicable.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. Remove oil, grease, and similar contaminants in accordance with SSPC-SP-1.
2. Clean off heavy rust and loose mill scale in accordance with SSPC-SP-2 "Hand Tool Cleaning," or SSPC-SP-3 "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize structural steel framing items located in exterior walls and where indicated on drawings.

2.9 SOURCE QUALITY CONTROL

A. Waiver of Source Quality Control: Source quality control testing shall not be required when fabricator participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant.

B. 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. Provide testing and inspecting agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Testing and inspection agency shall be acceptable to the Architect.

C. The Architect shall have the right to order the testing of any materials used in the steel construction to determine if they are of the quality specified.

D. Testing and Inspection Services: The following tests and inspections shall be performed by the designated laboratory.

1. Steel Testing:

a. All steel used for structural purposes shall be identified as required by 2013 CBC Section 2203.1 (CBC 2203A.1 for projects governed by the Division of the State Architect). Manufacturer's mill analyses and test reports are acceptable for properly identified steel, but the enforcement agency may require additional testing to determine the quality of the steel if there is any doubt as to its acceptability. Any steel not properly identified shall be tested to meet the minimum chemical and mechanical requirements of the ASTM standard appropriate for the steel specified for the structure.

b. Fabrication shall not commence until steel members designated on the Structural Testing and Inspection Schedule have been tested. Tests shall be made by an independent testing laboratory approved by the Architect. Reports certifying that the materials and workmanship conform to the contract documents shall be submitted to the Architect.

2. Inspection of Welding: Shop welding operations including the installation of automatic end-welded stud shear connectors shall be inspected by a certified Welding Inspector meeting the requirements of AWS QC1. The Fabricator shall schedule their operations to provide a minimum of 24 hours notice to the welding inspector so that all welding operations may be inspected.

a. The Welding Inspector shall make a systematic record of all welds; recording shall include the following:

1) Names and identification marks of welders.
2) List of defective welds.
3) Manner of correction of defects.

b. The Welding Inspector shall check the material, equipment, procedure, welds, and the ability of each welder.
c. Acceptance criteria shall be based on statically loaded connections. Upon detection of a rejectable weld, the inspector shall notify the Contractor, and observe removal of defects and repairs.
d. The welding inspector shall tag or stamp accepted weldments with the inspector's identification stamp.
e. A report stating that the welding they are required to inspect, is proper and has been done in conformity with approved drawings and specifications shall be furnished to the Architect.
f. Welding inspections, testing and frequency shall conform to AWS D1.1, AWS D1.8 and related AISC documents. The Welding Inspector shall use all means necessary to determine the quality of the welds. However, the following tests and inspections shall be performed as a minimum:

1) Visual Inspection of Welding:

a) Observe multi-pass and full penetration welds continuously (i.e. the welding inspector shall be present at all times).
b) Observe single pass fillet welds periodically. The inspector shall check the qualifications of the welders at the start of the work and then make final inspection of all welds for compliance prior to completion of welding.
c) After the welding is completed, Contractor shall hand or power nylon brush welds, and thoroughly clean them before inspection.
d) Inspect welds with magnifiers under strong, adequate light for surface cracking, porosity, and slag inclusions; excessive roughness; unfilled craters; gas pockets; undercuts; overlaps; size; and insufficient throat and concavity.
e) Inspect the preparation of groove welds for adequate throat opening and for snug positioning of back-up bars.
f) Check the type and size of electrodes to be used for the various joints and positions. Check the storage facilities to see if they are adequate to keep the electrodes dry.
g) Verify the use of proper pre-heat and interpass temperatures.
h) Observe the technique of each welder periodically with the use of a welding inspection shield.

2) Nondestructive Testing of Welding:

a) Welds shall be non-destructive tested by one of the following methods in accordance with AWS D1.1 and AWS D1.8 at testing agency's option or as required by AWS or AISC at the frequency noted below:

Test Method	Frequency
Liquid Dye Penetrant Testing ASTM E165	When requested by Architect.
Magnetic Particle Testing ASTM E709	10% of all fillet welds and 100% of all full penetration welds on mem-

	bers thinner than 5/16".
Ultrasonic Testing ASTM E164	100% of all full penetration welds on members thicker than 5/16"
Radiographic Testing ASTM E94	When requested by Architect or as substitute for magnetic particles testing or ultrasonic testing.

b) Reduced Frequency of Ultrasonic Testing: Initially, all welds requiring 100% testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder. If the reject rate is demonstrated to be less than 5% of the welds tested for each welder, then the frequency of testing for that welder may be reduced to 25%. If the reject rate increases to 5% or more, 100% testing shall be re-established until the rate is reduced to less than 5%. The percentage of rejects shall be calculated for each welder independently. A sample of at least 40 completed welds shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. For evaluating the reject rate of continuous welds over 3 feet in length, each 12 linear inch increment of welds, one inch or less in thickness, shall be considered one weld. For evaluating the reject rate of continuous welds greater than 1 inch thickness, each 6 linear inches shall be considered one weld.

c) Reduced Frequency of Magnetic Particle Testing: Initially, all welds requiring 100% testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder. If the reject rate is demonstrated to be less than 5% of the welds tested for each welder, then the frequency of testing for that welder may be reduced to 10%. If the reject rate increases to 5% or more, 100% testing shall be re-established until the rate is reduced to less than 5%. The percentage of rejects shall be calculated for each welder independently. A sample of at least 20 completed welds shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. This reduction is not permitted on welds in the K-area, at repair sites, weld tab and backing removal sites and access holes.

g. Correction of Defective Welds: Weld areas containing defects exceeding the standards of acceptance in AWS D1.1 and AWS D1.8 shall be corrected in accordance with AWS D1.1, Section 3.7 and AWS D1.8. Additional testing of the repaired areas shall be required.

3. Welded Threaded Studs, Concrete Anchors, and Shear Connector Studs: Test and inspect installation in accordance with AWS D1.1. Random sample and test from stock furnished to each project. Tests shall meet the requirements of ASTM A108.

a. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
b. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

4. Testing High Strength Bolts, Nuts and Washers: Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

   a. Materials: If the manufacturer's certification is not available, sample and test bolts, nuts and washers in accordance with ASTM A325 or A490, shipping lot method.
   b. Installation:

      1) Inspect slip critical connections and connections subject to direct tension in accordance with RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts.
      2) Tests shall be performed by an approved testing laboratory specifically approved for that purpose.
      3) The inspector shall check the materials, equipment, details of construction and installation procedure.
      4) The inspector shall furnish the Architect with a report that the work has been completed in every material respect in compliance with the approved drawings and specifications.

5. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

   1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Erect steel in accordance with the AISC Specification Section M4 and AISC Code Section 7 Except as modified herein.

1. Where parts cannot be assembled or fitted properly as a result of errors in fabrication or of deformation due to handling or transportation, report such condition immediately to the Architect and obtain approval for the methods of correction before proceeding with making any corrections.
2. Do not heat heat-treated parts for straightening.
3. Drain steelwork properly; fill pockets in structures exposed to the weather with an approved waterproof material.
4. When calibrated wrenches are used for tightening bolts, calibrate them at least once each working day using not less than three typical bolts of each diameter.

C. All structural steel framing shall be erected by experienced riggers and shall be carefully planned and laid out so that minimum cutting will be required. The work shall be erected plumb, square, and true to a line and level and in precise position as indicated. Temporary bracing, shoring and guys shall be introduced wherever necessary to provide for loads and stresses to which the structure may be subjected. Temporary bracing shall be left in place as long as may be required for safeguarding all parts of the work. As the erection progresses, the work shall be securely bolted up or welded, as required by the drawings to take care of all dead load, lateral forces and erection stresses.

D. Provide anchor bolts and other connections required for securing structural steel to foundations and other in-place work. Furnish templates and other devices as necessary for setting bolts to accurate locations. Tighten anchor bolts after supporting members have been positioned and plumbed. Do not use impact torque wrenches to tighten anchor bolts set in concrete or masonry.

E. Base Bearing and Leveling Plates: Clean concrete and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required to maintain plates in proper position while being grouted. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
2. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure prior to imposing dead or live loading on columns. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

F. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work. Visible welded joints shall be considered "finished" welds and shall be carefully executed to preclude the necessity of grinding or otherwise finishing. However, when the appearance of the weld is unacceptable, in the opinion of the Architect, grinding shall be of the highest standard for both field and shop practice.

G. Connections: Design connections for which details are not indicated in accordance with AISC "Manual of Steel Construction" for the full allowable shear capacity of the member.

H. Temporary welds, run-off plates, and backing strips shall be removed where exposed in the final structure.

I. Remove erection bolts on exposed, welded construction, fill holes with plug welds and grind smooth.

J. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

K. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

L. Splice members only where indicated.

M. Do not use thermal cutting during erection.

N. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

O. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 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 steel 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 test specimens on the project site.

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 1704.4 and Table 1704.3.
3. Steel Testing:
   a. All steel used for structural purposes shall be identified as required by 2013 CBC Section 2203.1 (CBC 2203A.1 for projects governed by the Division of the State Architect). Manufacturer's mill analyses and test reports are acceptable for properly identified steel, but the enforcement agency may require additional testing to determine the quality of the steel if there is any doubt as to its acceptability. Any steel not properly identified shall be tested to meet the minimum chemical and mechanical requirements of the ASTM standard appropriate for the steel specified for the structure.
   b. Fabrication shall not commence until steel members designated on the Structural Testing and Inspection Schedule have been tested. Tests shall be made by an independent testing laboratory approved by the Architect. Reports certifying that the materials and workmanship conform to the contract documents shall be submitted to the Architect.

4. Inspection of Field Erection:

   a. Verify qualifications of field procedures and personnel.
   b. Inspect erection of structural steel work for conformance with the drawings and specifications.

5. Inspection of Welding: Field welding operations including the installation of automatic end-welded stud shear connectors shall be inspected by a certified Welding Inspector meeting the requirements of AWS QC1. The Contractor shall schedule their operations to provide a minimum of 24 hours notice to the welding inspector so that all welding operations may be inspected.

   a. The Welding Inspector shall make a systematic record of all welds; recording shall include the following:

      1) Names and identification marks of welders.
      2) List of defective welds.
      3) Manner of correction of defects.

   b. The Welding Inspector shall check the material, equipment, procedure, welds, and the ability of each welder.
   c. Acceptance criteria shall be based on statically loaded connections. Upon detection of a rejectable weld, the inspector shall notify the Contractor, and observe removal of defects and repairs.
   d. The welding inspector shall tag or stamp accepted weldments with the inspector's identification stamp.
   e. A report stating that the welding required to be inspected is proper and has been done in conformity with approved drawings and specifications shall be furnished to the Architect.
   f. Welding inspections, testing, and frequency shall conform to AWS D1.1, AWS D1.8, and related AISC documents. The Welding Inspector shall use all means necessary to determine the quality of the welds. However, the following tests and inspections shall be performed as a minimum:

      1) Visual Inspection of Welding:

         a) Observe multi-pass and full penetration welds continuously (i.e. the welding inspector shall be present at all times).

b) Observe single pass fillet welds periodically. The inspector shall check the qualifications of the welders at the start of the work and then make final inspection of all welds for compliance prior to completion of welding.

c) After the welding is completed, Contractor shall hand or power nylon brush welds, and thoroughly clean them before inspection.

d) Inspect welds with magnifiers under strong, adequate light for surface cracking, porosity, and slag inclusions; excessive roughness; unfilled craters; gas pockets; undercuts; overlaps; size; and insufficient throat and concavity.

e) Inspect the preparation of groove welds for adequate throat opening and for snug positioning of back-up bars.

f) Check the type and size of electrodes to be used for the various joints and positions. Check the storage facilities to see if they are adequate to keep the electrodes dry.

g) Verify the use of proper pre-heat and interpass temperatures.

h) Observe the technique of each welder periodically with the use of a welding inspection shield.

2) Nondestructive Testing of Welding:

a) Welds shall be non-destructive tested by one of the following methods in accordance with AWS D1.1 and AWS D1.8 at the frequency noted below:

Test Method	Frequency
Liquid Dye Penetrant Testing	When requested by Architect.
Magnetic Particle Testing	10% of all fillet welds and 100% of all full penetration welds on members thinner than 5/16".
Ultrasonic Testing	100% of all full penetration welds on members thicker than 5/16"
Radiographic Testing	When requested by Architect or as substitute for magnetic particles testing or ultrasonic testing.

b) Reduced Frequency of Ultrasonic Testing: Initially, all welds requiring 100% testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder. If the reject rate is demonstrated to be less than 5% of the welds tested for each welder, then the frequency of testing for that welder may be reduced to 25%. If the reject rate increases to 5% or more, 100% testing shall be re-established until the rate is reduced to less than 5%. The percentage of rejects shall be calculated for each welder independently. A sample of at least 40 completed welds shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. For evaluating the reject rate of continuous welds over 3 feet in length, each 12 linear inch increment of welds, one inch or less in thickness, shall be considered one weld. For evaluating the reject rate of continuous welds greater than 1 inch thickness, each 6 linear inches shall be considered one weld.

c) Reduced Frequency of Magnetic Particle Testing: Initially, all welds requiring 100% testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder. If the reject rate is demonstrated to be less than 5% of the welds tested for each welder, then the frequency of testing for that welder may be reduced to 10%. If the reject rate increases to 5% or more, 100% testing shall be re-established until the rate is reduced to less than 5%. The percentage of rejects shall be calculated for each welder independently. A sample of at least 20 completed welds shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. This reduction is not permitted on welds in the K-area, at repair sites, weld tab and backing removal sites and access holes.

g. Correction of Defective Welds: Weld areas containing defects exceeding the standards of acceptance in AWS D1.1 and AWS D1.8 shall be corrected in accordance with AWS D1.1, Section 3.7 and AWS D1.8. Additional testing of the repaired areas shall be required.

6. Welded Threaded Studs, Concrete Anchors, and Shear Connector Studs: Test installation in accordance with AWS D1.1. Random sample and test from stock furnished to each project. Tests shall meet the requirements of ASTM A108.

a. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
b. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

7. Testing High Strength Bolts, Nuts and Washers:

a. Materials: If the manufacturer's certification is not available, sample and test bolts, nuts and washers in accordance with ASTM A325 or A490, shipping lot method.
b. Installation:

1) Inspect slip critical connections and connections subject to direct tension in accordance with RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts.
2) Tests shall be performed by an approved testing laboratory specifically approved for that purpose.
3) The inspector shall check the materials, equipment, details of construction and installation procedure.
4) The inspector shall furnish the Architect with a report that the work has been completed in every material respect in compliance with the approved drawings and specifications.

8. 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.

3.5 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION

SECTION 05 4000

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Exterior wall framing.
2. Interior load-bearing wall framing.
3. Roof rafter framing.

B. Related Sections include the following:

1. Division 03 Section “Post Installed Concrete Anchors” for post installed anchors in concrete and/or masonry.
2. Division 05 Section "Metal Fabrications" for miscellaneous framing with steel angles, channels, plates, and shapes.
3. Division 09 Section "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

1.03 STANDARDS AND REFERENCES

A. California Code of Regulations, Title 24, Part 2, California Building Code, 2013 Edition.

B. American Iron and Steel Institute (AISI) Specifications and Standards. Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1. Standard for Cold-formed Steel Framing – Header Design.
2. Standard for Cold-formed Steel Framing – Lateral Design.
3. Standard for Cold-formed Steel Framing – Wall Stud Design.

C. ASTM International (ASTM):

1. ASTM A 653, Steel Sheet, Zinc Coated (galvanized) or zinc-iron alloy-coated by the Hot Dip Process, Physical (Structural) Quality.
2. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
3. C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

4. A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
5. ASTM A 1008, Steel Sheet, Cold-Rolled, Carbon, Structural, High Strength, Low Alloy with improved formability.
6. ASTM A 1011, Sheet & Strip, Hot-Rolled, Carbon, Structural, High Strength, Low Alloy with improved formability.
7. ASTM C 645, Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
8. ASTM C 754, Installation of Steel Framing Members to Receive Screw Attached Gypsum Board.
9. ASTM C 1007, Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
10. C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

D. Federal Specifications

1. FF-P-395, Pin, Drive, Guided and Pin Drive, Power Actuated (Fasteners for Power Actuated and Hand Actuated Fastening Tools.
2. FF-S-325, Shield, Expansion: Nail, Expansion: and Nail, Drive Screw (Devices, Anchoring Masonry).

E. American Welding Society (AWS) Publication:

1. D1.1, Structural Welding Code, Steel.
2. D1.3, Structural Welding Code, Sheet Steel.

F. Metal Lath/Steel Framing Association (ML/SFA) Publication:

1. ML/SFA 540, Lightweight Steel Framing Systems.
2. ML/SFA 541, Selection Guidelines: Lightweight Steel Framing.
3. ML/SFA 920, Guide Specifications for Metal Lathing and Furring.

G. Steel Stud Manufacturers Association (SSMA):

1. Product Technical Information, ICC ESR-3064P.

1.04 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Welding certificates.

C. Research/Evaluation Reports: From ICC-ES or IAPMO ES, for the following:

1. Cold-formed metal framing.
2. Post installed concrete anchors.
3. Powder driven fasteners.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Use adequate number of skilled workmen who are thoroughly trained and experienced in the erection of cold formed steel framing and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling. Cover stored metal framing with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:

1. California Expanded Metal Products Company (CEMCO).
2. ClarkDietrich Building systems.
3. MarinoWare; a Division of Ware Industries.
4. SCAFCO Corp.

2.02 PERFORMANCE REQUIREMENTS

A. Cold-Formed Steel Framing Design Standards:

1. Floor and Roof Systems: AISI S210.
2. Wall Studs: AISI S211.
3. Headers: AISI S212.
4. Lateral Design: AISI S213.

B. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.

2.03 FRAMING MEMBERS

A. Steel Sheet Materials:
1. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, or ASTM A653/A653M, metallic coated, of grade and coating weight as follows:

a. Grade:

1) ST33H, 33 KSI for members 18 gauge (0.043 inch) and lighter in thickness.
2) ST50H, 50 KSI for members 16 gauge (0.054 inch) and heavier in thickness.

b. Coating: G60.

2. Steel Sheet for Vertical Deflection and/or Drift Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:

a. Grade: 50, Class 1 or 2.
b. Coating: G60.

B. Framing Members, General: Comply with ASTM C 955 for conditions indicated.

C. Steel Studs and Joists: Manufacturer's standard C-shaped steel studs and joists of web depths indicated, stiffened flanges, and as follows:

1. Studs: Punched openings regularly spaced along webs.
2. Joists: Un-punched webs.
3. Minimum Base-Metal Thickness: As indicated on Drawings.
4. Flange Width: As indicated on Drawings, 1-5/8 inches minimum.
5. Section Properties: As indicated on Drawings.

D. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and as follows:

1. Minimum Base-Metal Thickness: Matching steel studs.
2. Flange Width: 1-1/4 inches unless otherwise indicated.

E. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes, matching studs, used to form header beams, of web depths indicated, punched, with stiffened flanges, and as indicated on the Drawings.

F. Vertical Deflection Clips: Manufacturer's standard bypass or head clips as indicated on Drawings, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

G. Deflection Track: Single or double deflection track as indicated on Drawings.

1. Single Deflection Track: Manufacturer's deflection track as indicated on Drawings; single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, minimum base metal thickness matching studs.
2. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges, minimum base metal thickness matching studs.

H. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure.

2.04 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

2.05 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: Conform to ASTM A307.

C. Post Installed Concrete Anchors: Fabricated from corrosion-resistant materials; manufacturer, size, and type as indicated on Drawings and specified in Division 03 Section "Post Installed Concrete Anchors."

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, and conforming to Federal Specification FF-P-395.

1. Concrete Attachment: Use 0.157 inch diameter Hilti X-U pins with steel washers; embedment of steel pins into concrete shall not be less than 1-1/8 inch.
2. Steel Attachment: Use 0.157 inch diameter Hilti X-U (ICC ESR-2269) pins with steel washers; protrusion of steel pins through steel members shall not be less than 1/4 inch.

E. Screw Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: E60XX electrodes complying with AWS standards.

2.06 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.

C. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

D. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.07 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine supporting substrates and abutting structural framing 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.

3.02 INSTALLATION OF FRAMING, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by welding or screw fastening. Wire tying of framing members is not permitted.

    a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    b. Locate mechanical fasteners and install according to Drawings and complying with requirements for spacing, edge distances, and screw penetration.

D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

E. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

F. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

G. Install insulation, specified in Division 07 Section "Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

I. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

    1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 WALL FRAMING

A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings indicated on Drawings.

B. Squarely seat studs against top and bottom tracks with gap not exceeding of 1/8 inch between the end of wall framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as indicated on Drawings, spacing shall not to exceed 24 inches on center.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.

D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.

E. Align floor and roof framing over studs. Where framing cannot be aligned, continuously reinforce track to transfer loads.

F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure as indicated.

G. Install headers over wall openings wider than stud spacing. Locate headers above openings as indicated. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.

1. Frame wall openings as indicated on Drawings with not less than double studs at each side of jambs. Fasten jamb members together to uniformly distribute loads.
2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.

H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.

1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.

I. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

J. Install horizontal bridging in stud system, spaced 48 inches on center. Fasten at each stud intersection. Install bridging as indicated on Drawings, or if not indicated, install one of the following:

1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of 2 screws into each flange of the clip angle for framing members up to 6 inches deep.
2. Bridging: Combination of flat, taut, steel sheet straps, 1-1/2 by 0.0329 inch, and stud-track solid blocking of matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
3. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

K. Install steel sheet diagonal bracing straps to both stud flanges, terminate at and fasten to reinforced top and bottom tracks. Fasten clip-angle connectors to multiple studs at ends of bracing and anchor to structure.

L. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.04 JOIST FRAMING

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Drawings.

B. Install joists bearing on supporting framing, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.

1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Drawings.

C. Space joists not more than 2 inches from abutting walls, and as indicated on Drawings.

D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.

E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated on Drawings.

F. Install bridging at intervals indicated on Drawings. Fasten bridging at each joist intersection as follows:

1. Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

G. Secure joists to walls to prevent lateral movement of bottom flange.

H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

I. 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. The Architect shall have the right to order the testing of any materials used in the steel construction to determine if they are of the quality specified.

J. Field and shop welds will be subject to testing and inspecting.

K. Testing and inspecting agency will report test results promptly and in writing to Architect and Contractor.

L. Responsibilities and Duties of Contractor:

1. Maintain control of the quality of materials and workmanship and to obtain conformance with the drawings and specifications.
2. Facilitate testing and inspection as follows:

a. Furnish all necessary materials and labor to assist the designated testing laboratory in obtaining and handling samples at the project or other sources of materials.
b. Advise the designated testing laboratory sufficiently in advance of operations to allow for completion of quality tests and for the assignment of personnel.

3. The Contractor shall correct deficiencies in cold-formed metal framing which inspections and laboratory test reports have indicated to be not in compliance with requirements.

M. Testing and Inspecting: The following testing and inspecting shall be performed by the designated Testing and Inspection agency. Perform additional tests, as may be necessary to reconfirm any non-compliance of original work and as may be necessary to show compliance of corrected work.

1. Steel Testing:

   a. Cold formed steel framing shall be identified as required by 2013 CBC Section 2203 (CBC 2203A for projects governed by the Division of the State Architect). Manufacturer's mill analyses and test reports are acceptable for properly identified steel, but the enforcement agency may require additional testing to determine the quality of the steel if there is any doubt as to its acceptability. Any steel not properly identified shall be tested to meet the minimum chemical and mechanical requirements of the ASTM standard appropriate for the steel specified for the structure.
   b. Fabrication shall not commence until steel members designated on the Structural Testing and Inspection Schedule have been tested. Tests shall be made by an independent testing laboratory approved by the Architect. Reports certifying that the materials and workmanship conform to the contract documents shall be submitted to the Architect.

2. Shop Fabrication:

   a. Inspection of shop fabrication of all members shall be performed by an independent testing laboratory approved by the Architect.
   b. A report stating that all the materials and workmanship conform to approved drawings and specifications shall be submitted to the Architect.

3. Field Erection:

   a. Verify qualifications of field procedures and personnel.
   b. Inspect erection of cold formed steel work for conformance with the drawings and specifications.

4. Welding:

   a. All shop and field welding operations shall be inspected by a certified Welding Inspector meeting the requirements of AWS QC1 and who has been approved by the Architect. The Contractor shall schedule his operations to provide a minimum of 24 hours notice to the welding inspector so that all welding operations may be inspected.
   b. The Welding Inspector shall be an individual trained and thoroughly experienced in inspecting welding operations. The Welding Inspector's ability to distinguish between sound and unsound welding shall be reliably established.
   c. The Welding Inspector shall make a systematic record of all welds. This record shall include:

      1) Names and identification marks of welders.
      2) List of defective welds.
      3) Manner of correction of defects.

   d. The Welding Inspector shall check the material, equipment and procedure as well as the welds. He shall also check the ability of the welder.

e. Upon detection of a rejectable weld, the inspector shall notify the Contractor, and observe removal of defects and repairs.

f. The welding inspector shall tag or stamp accepted weldments with the inspector's identification stamp

g. A report stating that the welding he is required to inspect, is proper and has been done in conformity with approved drawings and specifications shall be furnished to the Architect.

h. The Welding Inspector shall use all means necessary to determine the quality of the welds. Inspection procedures shall conform to AWS D1.3. However, the following tests and inspections shall be performed as a minimum:

1) Visual Inspection of Welding:

a) Observe multi-pass and full penetration welds continuously (i.e. the welding inspector shall be present at all times).

b) Observe single pass fillet welds periodically. The inspector shall check the qualifications of the welders at the start of the work and then make final inspection of all welds for compliance prior to completion of welding.

c) After the welding is completed, hand or power nylon brush welds, and thoroughly clean them before inspection.

d) Inspect welds with magnifiers under strong, adequate light for surface cracking, porosity, and slag inclusions; excessive roughness; unfilled craters; gas pockets; undercuts; overlaps; size; and insufficient throat and concavity.

e) Inspect the preparation of groove welds for adequate throat opening and for snug positioning of back-up bars.

f) Check the type and size of electrodes to be used for the various joints and positions. Check the storage facilities to see if they are adequate to keep the electrodes dry.

g) Verify the use of proper pre-heat and interpass temperatures.

h) Observe the technique of each welder periodically with the use of a welding inspection shield.

2) Nondestructive Testing of Welding:

a) Welds shall be non-destructive tested by one of the following methods in accordance with AWS D1.1 at the frequency noted below:

Test Method	Frequency
Liquid Dye Penetrant Testing	When requested by Architect.
Magnetic Particle Testing	10% of all fillet welds and 100% of all full penetration welds
Radiographic Testing	When requested by Architect or as substitute for magnetic particles testing or ultrasonic testing.

b) Reduced Frequency of Testing: Initially, all welds requiring 100% testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder. If the reject rate is demonstrated to be less than 5% of the welds tested for each welder,

then the frequency of testing for that welder may be reduced to 25%. If the reject rate increases to 5% or more, 100% testing shall be re-established until the rate is reduced to less than 5%. The percentage of rejects shall be calculated for each welder independently. A sample of at least 40 completed welds shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. For evaluating the reject rate of continuous welds over 3 feet in length, each 12 linear inch increment of welds, one inch or less in thickness, shall be considered one weld. For evaluating the reject rate of continuous welds greater than 2 inch thickness, each 6 linear inches shall be considered one weld.

N. Remove and replace work where test results indicate that it does not comply with specified requirements.

O. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.05 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer ensuring cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05 5000

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.
4. Stainless steel pipe railings.
5. Steel pipe railings

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.
3. Division 05 Section "Structural Steel Framing."

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.

H. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.

I. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

J. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

K. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

L. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.

M. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

N. Wire Rod for Grating Crossbars: ASTM A 510.

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 HAND RAILINGS AND GUARDS

A. General: Fabricate railings and guards to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

1. Regulatory Requirements: Handrails, guards, and infill rails or panels shall comply with the California Building Code.
2. Material: Fabricate handrails and guards from Schedule 40 steel pipe or round steel tubing of sizes indicated on Drawings.

   a. Finish: Exterior handrails and guards shall be galvanized after fabrication.

3. Handrails:

   a. Diameter: 1-1/4 inch minimum, 2 inch maximum outside diameter.

b. Height: 34 inches minimum, 38 inches maximum vertically above the walking surface of ramps and/or walks, and the nosing of stair treads to the top of handrail gripping surfaces. Design height shall be 36 inches.

c. Handrail Extensions: Handrail extensions shall be in the direction of the stair or ramp run, and as follows:

1) Stair Handrails: At upper landings, handrails shall extend a minimum 12 inches horizontally beyond the top nosing. At lower landings, handrails shall continue to slope for a distance equal to one tread depth beyond the bottom tread nosing; the remainder of the extension shall be horizontal for a minimum distance of 12 inches.

2) Ramp Handrails: Handrails shall extend horizontally for 12 inches minimum beyond the upper and lower limits of the ramp surface.

4. Guards: At open sided floor or walking surfaces that are more than 30 inches above the adjacent grade, guards shall be not less than 42 inches above the upper floor or ground surface.

a. Openings between intermediate rails or in panels shall be such that a 4 inch diameter sphere shall not pass through any openings.

B. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

C. Connections: Fabricate railings with welded connections unless otherwise indicated. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

D. Form Changes in Direction by bending or by inserting prefabricated elbow fittings.

1. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

E. Close exposed ends of railing members with prefabricated end fittings.

F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

G. Handrail Surfaces: Grind and finish handrails and welds smooth to be free of sharp, rough, or abrasive surfaces.

H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

I. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

J. For railing posts set in concrete, provide steel sleeves as detailed on Drawings.

2.9 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.

2.10 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.

2.11 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

C. Dull Satin Finish: No. 6.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

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 HAND RAILINGS AND GUARDS

A. Pipe Railing and Post Connections, General: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 Articles "Fabrication, General" and “Hand Railings and Guards” whether welding is performed in the shop or in the field.

1. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

B. Anchoring Posts in Concrete: Anchor posts as indicated on Drawings and as follows:

1. Core-drill holes not less than 6 inches deep and 3/4 inch larger than OD of post for installing posts in concrete, or use metal sleeves of equivalent size, preset and anchored into concrete. Clean holes of loose material, insert posts, and fill annular space between post and sleeve or concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
2. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material or attached to post with set screws.
3. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch buildup, sloped away from post.

C. Attaching Handrails to Walls: Attach handrails to walls with wall brackets as indicated on Drawings and as follows:

1. Brackets with 1-1/2-inch minimum clearance between inside face of handrail and finished wall surface.

   a. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate blocking with carpentry work to locate backing members.
4. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements. Coordinate backing with steel framed partition work.
5. Use crush sleeves where fastening brackets to walls through gypsum board.

3.5 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 06 1600

PLYWOOD ROOF AND WALL SHEATHING

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. Wall sheathing.
2. Roof sheathing.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 ROOF AND WALL SHEATHING

A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exposure 1, structural sheathing unless otherwise indicated.

1. Span Rating: As indicated on Drawings.
2. Nominal Thickness: As indicated on Drawings.

B. Oriented-Strand-Board Sheathing: DOC PS 2, Exposure 1 sheathing.

1. Span Rating: As indicated on Drawings.
2. Nominal Thickness: As indicated on Drawings.

C. Factory mark panels to indicate compliance with applicable standard.

2.2 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. For exterior sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C 1002.

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

2.3 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Adhesives shall have a VOC content of 50 g/L or less.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated on Drawings complying with the following:

1. NES NER-272 for power-driven fasteners.
2. 2013 California Building Code, Table 2304.9.1 “Fastening Schedule.”

D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

G. Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

H. Fastening Methods: Nail wall and roof sheathing panels to wood framing. Space panels 1/8 inch apart at edges and ends.

END OF SECTION

SECTION 06 1753

SHOP-FABRICATED WOOD TRUSSES

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. This Section includes the following:

1. Wood roof trusses.

B. Related Sections include the following:

1. Division 06 Section “Sheathing.”

1.3 DEFINITIONS

A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

B. TPI: Truss Plate Institute, Inc.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NLGA: National Lumber Grades Authority.
2. WCLIB: West Coast Lumber Inspection Bureau.
3. WWPA: Western Wood Products Association.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.

1. Design Loads: As indicated on Drawings.
2. Maximum Deflection Under Design Loads: Roof trusses, vertical deflection of 1/240 of span for total load and 1/360 of pan for roof live load only..

1.5 SUBMITTALS

A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.

B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer. Show fabrication and installation details for trusses.

1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
2. Indicate sizes, stress grades, and species of lumber.
3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
4. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
5. Show splice details and bearing details.
6. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Governing Agency Deferred Approval: Shop fabricated wood trusses shall be subject to a deferred approval by the Governing Agency. The Contractor shall prepare and submit to the Governing Agency a deferred approval package including shop drawings and structural calculations for shop fabricated wood trusses.

1. Structural analysis data and details shall be signed and sealed by the qualified professional engineer responsible for their preparation. Engineer shall be a Civil or Structural Engineer licensed in the state of California.

D. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

E. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Metal-plate connectors.
2. Metal truss accessories.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

B. Source Limitations for Connector Plates: Obtain metal connector plates from a single manufacturer.

C. Comply with applicable requirements and recommendations of the following publications:

1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
3. TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."

D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses to comply with recommendations of TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."

1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
3. Provide for air circulation around stacks and under coverings.

B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

1.8 COORDINATION

A. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

PART 2 - PRODUCTS

2.1 DIMENSION LUMBER

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S.
3. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

B. Grade and Species: Provide visually graded dimension lumber for truss chord and web members, of not less than the following grade and following species:

1. Grade for Chord Members: No. 2.
2. Grade for Web Members: Same grade as indicated for chord members.
3. Species: Douglas fir-larch; WCLIB or WWPA.

C. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 06 Section Rough Carpentry.

2.2 METAL CONNECTOR PLATES

A. General: Fabricate connector plates to comply with TPI 1.

B. Hot-Dip Galvanized Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

2.4 METAL TRUSS ACCESSORIES

A. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on Drawings as manufactured by Simpson Strong-Tie Co., Inc.

2.5 FABRICATION

A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.

C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.

1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.

B. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

C. Install and brace trusses according to TPI recommendations and as indicated.

D. Install trusses plumb, square, and true to line and securely fasten to supporting construction.

E. Space trusses as indicated; adjust and align trusses in location before permanently fastening.

F. Anchor trusses securely at bearing points; use metal truss tie-downs as applicable. Install fasteners through each fastener hole in truss accessories according to manufacturer's fastening schedules and written instructions.

G. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

1. Install bracing to comply with Division 06 Section Rough Carpentry.

H. Install wood trusses within installation tolerances in TPI 1.

I. Do not cut or remove truss members.

J. Replace wood trusses that are damaged or do not meet requirements.

1. Do not alter trusses in field.

3.2 REPAIRS AND PROTECTION

A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION

SECTION 06 1800

GLUED-LAMINATED CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes framing using structural glued-laminated timber.

1.3 DEFINITIONS

A. Structural Glued-Laminated (Glulam) Timber: An engineered, stress-rated timber product assembled from selected and prepared wood laminations bonded together with adhesives and with the grain of the laminations approximately parallel longitudinally.

1.4 SUBMITTALS

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

1. Include data on lumber, adhesives, fabrication, and protection.
2. For connectors, include installation instructions.

B. Shop Drawings:

1. Show layout of structural glued-laminated timber system and full dimensions of each member.
2. Indicate species and laminating combination, adhesive type, and other variables in required work.
3. Include large-scale details of connections.

C. Certificates of Conformance: Issued by a qualified testing and inspecting agency indicating that structural glued-laminated timber complies with requirements in AITC A190.1.

D. Material Certificates: For preservative-treated wood products, from manufacturer. Indicate type of preservative used and net amount of preservative retained.

E. Research/Evaluation Reports: For structural glued-laminated timber and timber connectors, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: An AITC- or APA-EWS-licensed firm.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with provisions in AITC 111.

B. Individually wrap members using plastic-coated paper covering with water-resistant seams.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Structural glued-laminated timber and connectors shall withstand the effects of structural loads shown on Drawings without exceeding allowable design working stresses listed in AITC 117 or determined according to ASTM D 3737 and acceptable to authorities having jurisdiction.

B. Seismic Performance: Structural glued-laminated timber and connectors shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

2.2 STRUCTURAL GLUED-LAMINATED TIMBER

A. General: Provide structural glued-laminated timber that complies with ANSI/AITC A190.1 and AITC 117 or research/evaluation reports acceptable to authorities having jurisdiction.

1. Factory mark each piece of structural glued-laminated timber with AITC Quality Mark or APA-EWS trademark. Place mark on surfaces that are not exposed in the completed Work.
2. Provide structural glued-laminated timber made from single species.
3. Provide structural glued-laminated timber made from solid lumber laminations; do not use laminated veneer lumber.
4. Provide structural glued-laminated timber made with wet-use adhesive complying with ANSI/AITC A190.1.

a. Use adhesive that contains no urea-formaldehyde resins.

B. Species and Grades for Structural Glued-Laminated Timber:

1. Species and Beam Stress Classification: Douglas fir-larch, 24F-1.8E
2. Lay-up: Either balanced or unbalanced.
3. Species and Combination Symbol: Douglas fir-larch 24F-V4 or 24F-V8 as indicated on Drawings.

2.3 TIMBER CONNECTORS

A. General: Unless otherwise indicated, fabricate from the following materials:

1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.
2. Round steel bars complying with ASTM A 575, Grade M 1020.
3. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 33.

B. Manufactured Timber Connectors, Basis of Design: Provide products as indicated on Drawings manufactured by the following:

1. Simpson Strong-Tie Co., Inc.

C. Bolts: Unless otherwise indicated, provide 3/4 inch diameter bolts complying with ASTM A 307, Grade A; nuts complying with ASTM A 563; and where indicated, flat washers.

D. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil dry film thickness.

2.4 MISCELLANEOUS MATERIALS

A. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

B. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

2.5 FABRICATION

A. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.

1. Dress exposed surfaces as needed to remove planing and surfacing marks.

B. Camber: Fabricate horizontal and inclined members of less than 1:1 slope with either circular or parabolic camber equal to 1/500 of span.

C. End-Cut Sealing: Immediately after end cutting each member to final length, apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.

D. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit, except for preservative-treated wood where treatment included a water repellent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates in areas to receive structural glued-laminated timber, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of structural glued-laminated timber.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Erect structural glued-laminated timber true and plumb, and with uniform, close-fitting joints. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.

1. Install structural glued-laminated timber in compliance with Shop Drawings.

B. Cutting: Avoid extra cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.

1. Predrill for fasteners using timber connectors as templates.
2. Finish exposed surfaces to remove planing or surfacing marks and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.
3. Coat cross cuts with end sealer.

C. Install timber connectors as indicated.

1. Unless otherwise indicated, install bolts with same orientation within each connection and in similar connections.

3.3 ADJUSTING

A. Repair damaged surfaces after completing erection. Replace damaged structural glued-laminated timber if repairs are not approved by Architect.

3.4 PROTECTION

A. Do not remove wrappings on individually wrapped members until they no longer serve a useful purpose including protection from weather, sunlight, soiling, and damage from work of other trades.

1. Coordinate wrapping removal with finishing work specified in Division 09. Retain wrapping where it can serve as a painting shield.
2. Slit underside of wrapping to prevent accumulation of moisture inside the wrapping.

END OF SECTION

SECTION 07 1113

BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes cold-applied, emulsified-asphalt dampproofing.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise required.

2.02 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. APOC, Inc.; a division of Gardner-Gibson.
2. BASF Construction Chemicals - Building Systems; Sonneborn Brand Products.
3. Brewer Company (The).
4. ChemMasters, Inc.
5. Euclid Chemical Company (The); an RPM company.
6. Gardner-Gibson, Inc.
7. Henry Company.
8. Karnak Corporation.
9. Koppers Inc.
10. Malarkey Roofing Products.
11. Meadows, W. R., Inc.

B. Trowel Coats: ASTM D 1227, Type II, Class 1.

C. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.

D. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

E. VOC Content: 30 g/L or less.

2.03 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.

1. Primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.

D. Protection Course: ASTM D 6506, 1/8-inch- (3-mm-) thick, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners.

PART 3 - EXECUTION

3.01 APPLICATION, GENERAL

A. Comply with manufacturer's written instructions for substrate preparation, dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.
   1. Apply dampproofing to provide continuous plane of protection.
   2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches (150 mm) over outside face of footing.
   1. Extend dampproofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
   2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- (200-mm-) wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.02 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Concrete Foundations: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. (0.6 L/sq. m) for first coat and 1 gal./100 sq. ft. (0.4 L/sq. m) for second coat, one fibered brush or spray coat at not less than 3 gal./100 sq. ft. (1.2 L/sq. m), or one trowel coat at not less than 4 gal./100 sq. ft. (1.6 L/sq. m).

B. Unparged Masonry Foundation Walls: Apply primer and two brush or spray coats at not less than 1.5 gal./100 sq. ft. (0.6 L/sq. m) for first coat and 1 gal./100 sq. ft. (0.4 L/sq. m) for second coat, primer and one fibered brush or spray coat at not less than 3 gal./100 sq. ft. (1.2 L/sq. m,) or primer and one trowel coat at not less than 5 gal./100 sq. ft. (2 L/sq. m).

C. Interior Face of Single-Wythe Exterior Masonry Walls: Where above grade and indicated to be furred and finished, apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq. m).

3.03 INSTALLATION OF PROTECTION COURSE

A. Where indicated, install protection course over completed-and-cured dampproofing. Comply with dampproofing-material and protection-course manufacturers' written instructions for attaching protection course.

END OF SECTION

SECTION 07 2100

THERMAL INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Foam-plastic board insulation.
2. Glass-fiber board insulation.
3. Mineral-wool board insulation.
4. Glass-fiber blanket insulation.
5. Mineral-wool blanket insulation.

1.02 ACTION SUBMITTALS

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

1.03 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Research/evaluation reports.

1.04 REGULATORY REQUIREMENTS

A. All insulation shall be certified by Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation that the insulation conductive thermal performance is approved pursuant to the California Code of Regulations, Title 24, Part 12, Chapters 12-13. Article 3, "Standards for Insulating Material."

PART 2 - PRODUCTS

2.01 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation (XPS): ASTM C 578, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. DiversiFoam Products.
b. Dow Chemical Company (The).
c. Owens Corning.
d. Pactiv Building Products.
2. Basis-of-Design Product: Owen Corning Foamular 150 XPS Insulation.
3. Type X, 15 psi (104 kPa).

B. Thickness: 1 inch (25.4 mm). Molded-Polystyrene Board Insulation (EPS): ASTM C 578, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. DiversiFoam Products.

b. Plymouth Foam, Inc.
2. Type II, 15 psi.

2.02 GLASS-FIBER BOARD INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CertainTeed Corporation.
2. Johns Manville.
3. Knauf Insulation.
4. Owens Corning.

B. Glass-Fiber Board Insulation: ASTM C 612, Type IA; foil faced, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84.
1. Nominal density of 2.25 lb/cu. ft. (36 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C).

2.03 MINERAL-WOOL BOARD INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Fibrex Insulations Inc.
2. Isolatek International.
3. Owens Corning.
4. Roxul Inc.
5. Thermafiber.
6. Basis of Design Product: Owens Corning Thermafiber SAFB.

B. Unfaced, Mineral-Wool Board Insulation: ASTM C 612; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
1. Nominal density of 2.5 lb/cu. ft. (40 kg/cu. m), Types IA and IB, thermal resistivity of 3.7 deg F x h x sq. ft./Btu x in. at 75 deg F (25.7 K x m/W at 24 deg C).

2.04 GLASS-FIBER BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Knauf Insulation.
5. Owens Corning.

B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

C. Polypropylene-Scrim-Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

2.05 MINERAL-WOOL BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Fibrex Insulations Inc.
   2. Owens Corning.
   3. Roxul Inc.
   4. Thermafiber.

B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.06 MISCELLANEOUS ACCESSORIES

A. Insulation Adhesive: Foam-plastic board insulation manufacturer's standard formulation designed for indicated use; compatible with substrate; with VOC content of 50 g/L or less.

B. Sealant: Type recommended by foam-plastic board insulation manufacturer as required to form a tight seal.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.02 INSTALLATION OF INSULATION BEHIND CEMENT PLASTERING (STUCCO)

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

B. Foam-Plastic Board Insulation: Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

3.03 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
   1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
   2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
   4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
   5. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
      a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
      b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
   1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

END OF SECTION

SECTION 07 2500

WEATHER BARRIERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Building paper.
2. Building wrap.
3. Flexible flashing.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.03 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For water-resistive barrier and flexible flashing, from ICC-ES.

PART 2 - PRODUCTS

2.01 WATER-RESISTIVE BARRIER

A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.

B. Building Paper: Water-vapor-permeable, asphalt-saturated kraft building paper that complies with ICC-ES AC38, Grade D; except with water-resistance rating not less than 1 hour.
1. Basis of Design Product: Fortifiber Two-Ply Super Jumbo Tex 60 Minute Weather Resistive Barrier.

C. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.
1. Basis of Design Product: DuPont Tyvek StuccoWrap.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Cosella-Dörken Products, Inc.
   b. Dow Chemical Company (The).
   c. DuPont Building Innovations: E. I. du Pont de Nemours and Company.
   d. Raven Industries, Inc.
3. Water-Vapor Permeance: Not less than 20 perms (1150 ng/Pa x s x sq. m) per ASTM E 96/E 96M, Desiccant Method (Procedure A).
4. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

D. Building-Wrap Flashing Tape: Pressure-sensitive flexible membrane plastic tape recommended by building-wrap manufacturer for sealing window openings and penetrations in building wrap.
   1. Basis of Design Product: DuPont Tyvek FlexWrap.

E. Fasteners: 1-inch plastic cap staples with leg length sufficient to achieve a minimum penetration of 5/8-inch into the wood sheathing.

2.02 FLEXIBLE FLASHING

A. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin
   1. Product compatible with building wrap manufacturer.
   2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

B. Rubberized-Asphalt Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin.
   1. Product compatible with building wrap manufacturer.
   2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

PART 3 - EXECUTION

3.01 WATER-RESISTIVE BARRIER INSTALLATION

A. Cover sheathing with water-resistive barrier as follows:
   1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
   2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap unless otherwise indicated.

B. Building Paper: Apply horizontally with a 2-inch (50-mm) overlap and a 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails.

C. Building Wrap: Comply with manufacturer's written instructions and warranty requirements.
   1. Seal seams, edges, fasteners, and penetrations with tape.
   2. Extend into jambs of openings and seal corners with tape.

3.02 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.
   1. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
   2. Lap flashing over water-resistive barrier at bottom and sides of openings.
   3. Lap water-resistive barrier over flashing at heads of openings.

END OF SECTION

SECTION 07 3216

CONCRETE ROOF TILES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Concrete roof tiles.
2. Underlayment.

1.02 ACTION SUBMITTALS

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

B. Samples: For each type of concrete roof tile and accessory tile indicated.

1.03 INFORMATIONAL SUBMITTALS

A. Material test reports.

B. Research/evaluation reports.

1.04 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide concrete roof tiles and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure: Class C; UL 790 or ASTM E 108, for application and roof slopes indicated.

B. Preinstallation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.01 CONCRETE ROOF TILES

A. Concrete Roof Tiles: ASTM C 1492, molded- or extruded-concrete roof tile units of shape and configuration indicated, with integral color, and free of surface imperfections. Provide with fastening holes prepunched at factory.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Boral Roofing.
b. Eagle Roofing Products (Basis of Design).
c. MonierLifetile LLC.
d. Westile Roofing Products.
2. Weight: Standard.
3. High-Profile Shape: Spanish
4. Side Configuration: Interlocking.
5. Size: 13 inches x 17 inches

6. Solar Reflectance Index: Not less than 16 when calculated according to ASTM E 1980, based on testing of identical products by a qualified testing agency.
7. Colors, Blends, and Patterns: As selected by Architect from manufacturer's full range.
8. Finish and Texture: Matte, smooth.
9. High Profile-Shape Accessory Tiles: Ridge, ridge end, hip and hip starter, header course, roll rake edge, starter, end band and terminal units, in color matching concrete roof tiles.

2.02 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Cold-Applied Adhesive: Manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with underlayments.

C. Mortar: ASTM C 270, Type M, natural color.

D. Eave Closure: Manufacturer's standard metallic-coated steel eave closure formed to shape of concrete roof tiles. 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.

E. Ridge Closure: Manufacturer's standard EPDM ridge closure, formed to shape of concrete roof tiles.

F. Wood Nailers: Wood Battens: Comply with requirements for pressure-preservative-treated wood in Section 06 1000 "Rough Carpentry."

2.03 FASTENERS

A. Roofing Nails: ASTM F 1667, 0.1055-inch- hot-dip galvanized-steel, 0.1055-inch-diameter shank, sharp-pointed, conventional roofing nails with barbed shanks; minimum 3/8-inch- (10-mm-) diameter head; of sufficient length to penetrate 3/4 inch (19 mm) into roof-deck sheathing.

B. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

C. Wood Batten Nails: ASTM F 1667; common or box, steel wire, flat head, and smooth shank.

D. Wire Ties: Copper or Stainless steel, 0.083-inch (2.1-mm) minimum diameter.

2.04 UNDERLAYMENT MATERIALS

A. Felt Underlayment: ASTM D 226, Type II, asphalt-saturated organic felt, unperforated.

B. Felt Underlayment: ASTM D 2626, asphalt-saturated and -coated organic felt, dusted with fine mineral surfacing on both sides, unperforated.

C. Roll Roofing Underlayment: ASTM D 6380, Class M, Type II, asphalt-saturated and -coated organic felt, mineral-granule surfaced.

D. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970, minimum of 55-mil- (1.4-mm) thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.

E. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil- (1.0-mm) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.

2.05 METAL FLASHING AND TRIM

A. Comply with requirements in Section 07 6200 "Sheet Metal Flashing and Trim."
   1. Sheet Metal: Zinc-tin alloy-coated steel

PART 3 - EXECUTION

3.01 UNDERLAYMENT INSTALLATION

A. General: Comply with concrete roof tile manufacturer's written instructions and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Self-Adhering Sheet Underlayment: Install wrinkle free; comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (152 mm), staggered 24 inches (610 mm) between succeeding courses. Roll laps with roller. Cover underlayment within seven days.

3.02 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 07 62 00 "Sheet Metal Flashing and Trim."
   1. Install metal flashings according to concrete roof tile manufacturer's written instructions and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

3.03 WOOD NAILERS AND BATTENS

A. Install wood nailers at ridges, hips and rakes and securely fasten to roof deck.

B. Install beveled wood cant at eaves and securely fasten to roof deck.

C. Install nominal 1-by-2-inch (25-by-50-mm) wood battens horizontally in 48-inch (1200-mm) lengths with ends separated by 1/2 inch (13 mm) at spacing required by concrete roof tile manufacturer, and securely fasten to roof deck.

1. Install nominal 1-by-2-inch (25-by-50-mm) wood counter battens vertically spaced 24 inches (610 mm) apart and securely fasten to roof deck.

3.04 CONCRETE ROOF TILE INSTALLATION

A. General: Install concrete roof tiles according to manufacturer's written instructions, to recommendations in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions," and to NRCA's "The NRCA Roofing and Waterproofing Manual."
   1. Maintain uniform exposure and coursing of concrete roof tiles throughout roof.
   2. Extend tiles 2 inches (50 mm) over eave fasciae.
   3. Nail Fastening: Drive nails to clear the concrete roof tile so the tile hangs from the nail and is not drawn up.
      a. Install wire through nail holes of cut tiles that cannot be nailed directly to roof deck, and fasten to nails driven into deck.
   4. Wire-Tie Fastening: Install wire-tie systems and fasten concrete roof tiles according to manufacturer's written instructions.
   5. Mortar Setting: Install concrete roof tiles according to TRI/FRSA's "Concrete and Clay Roof Tile Installation Manual."
   6. Install storm clips to capture edges of longitudinal sides of concrete roof tiles and securely fasten to roof deck.
   7. Install concrete roof tile locks to support and lock overlying tile butts to underlying tiles.
   8. Cut and fit concrete roof tiles neatly around roof vents, pipes, ventilators, and other projections through roof. Fill voids with mortar.
   9. Install concrete roof tiles with color blend approved by Architect.

B. High-Profile Concrete Roof Tile Installation:
   1. Install sheet metal eave closure.
   2. Provide minimum 3-inch (75-mm) lap between succeeding courses of concrete roof tiles.
   3. Install roll rake tiles.
   4. Install ridge tiles with laps facing away from prevailing wind. Seal laps with [butyl elastomeric sealant.

C. Open Valleys: Cut concrete roof tiles at open valleys to form straight lines. Maintain uniform width of exposed open valley from highest to lowest point.
   1. Drill or notch cut valley tiles and wire-tie to fastener placed clear of valley metal flashings.
   2. Do not nail tiles to metal flashings.

D. Remove and replace damaged or broken concrete roof tiles.

END OF SECTION

SECTION 07 4213.53

METAL SOFFIT PANELS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes metal soffit panels.

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: Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

C. Samples: For each type of metal panel indicated.

1.04 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Warranties: Samples of special warranties.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.06 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
   1. Wind Loads: As indicated on Drawings.
   2. Other Design Loads: As indicated on Drawings.

3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:
1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa)

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.02 METAL SOFFIT PANELS

A. General: Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. V-Groove-Profile Metal Soffit Panels: Half-perforated panels formed with vertical panel edges and a flat pan between panel edges; with a V-groove joint between panels.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide Pac- Clad 750 or comparable product by one of the following:
a. ATAS International, Inc.
b. Berridge Manufacturing Company.
c. Dimensional Metals, Inc.
d. Englert, Inc.
e. Fabral.
f. Innovative Metals Company, Inc.
g. McElroy Metal, Inc.
h. Petersen Aluminum Corporation.
3. Aluminum Sheet: Coil-coated sheet, ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
a. Thickness: 0.032 inch (0.81 mm).
b. Surface: Smooth, flat finish.
c. Exterior Finish: Two-coat fluoropolymer.
d. Color: As selected by Architect from manufacturer's full range.
4. Panel Coverage: 12 inches (305 mm).
5. Panel Height: 0.50 inch (13 mm).

2.03 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch (25-mm) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C 920; as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.04 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

2.05 FINISHES

A. Panels and Accessories:

1. 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.

2. Concealed Finish: White or light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.01 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.02 METAL PANEL INSTALLATION

A. Metal Soffit Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

B. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.

C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

3.03 CLEANING

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

END OF SECTION

SECTION 07 6200

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.
2. Formed roof-drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.
4. Formed steep-slope roof sheet metal fabrications.
5. Formed wall sheet metal fabrications.

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. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

B. Mockups: Build mockups to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1. Build mockup of typical roof parapet wall cap and fascia / fascia trim approximately 10 feet (3.0 m) long.

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. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on the drawings.

D. 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.

H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.05 MANUFACTURED REGLETS

A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and welded corners and junctions with interlocking counterflashing on exterior face, of same metal as reglet.
   1. Fry Reglet (or approved equal)
   2. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
   3. Finish: Mill, with manufacturer's standard color coating..

2.06 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.

2.07 ROOF-EDGE DRAINAGE SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. ATAS International, Inc.
   2. Castle Metal Products.
   3. Cheney Flashing Company.
   4. Hickman Company, W. P.
   5. Metal-Era, Inc.
   6. Metal-Fab Manufacturing, LLC.

B. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.
   1. Zinc-Coated Steel: Nominal 0.028-inch thickness.

C. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout and built-in overflow.
   1. Zinc-Coated Steel: Nominal 0.028-inch thickness.

D. Zinc-Coated Steel Finish: Two-coat fluoropolymer.
   1. Color: As selected by Architect from manufacturer's full range.

2.08 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Copings: Fabricate in minimum 96-inch (2400-mm) long, but not exceeding 10-foot (3.0 m) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, solder or weld watertight. Shop fabricate interior and exterior corners.
   1. Fabricate from the Following Materials:
      a. Galvanized Steel: 0.040 inch (1.02 mm) thick.

B. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

C. Counterflashing and Flashing Receivers: Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

D. Roof-Penetration Flashing: Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch (0.71 mm) thick.

E. Roof-Drain Flashing: Fabricate from the following materials:
   1. Stainless Steel: 0.016 inch (0.40 mm) thick.

2.09 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch (2400-mm) long, but not exceeding 10-foot (3.0 m-) long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings; and form with 2-inch (50-mm) high, end dams. Fabricate from the following materials:
   1. Stainless Steel: 0.016 inch (0.40 mm) thick.

PART 3 - EXECUTION

3.01 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

3.02 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.
   1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
   2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

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. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

E. 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.

F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

G. 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.

H. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.03 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.04 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Section 04 20 00 "Unit Masonry."

C. Reglets: Installation of reglets is specified in Section 04 20 00 "Unit Masonry."

D. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

3.05 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 7100

ROOF SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Copings.
2. Roof-edge specialties.
3. Roof-edge drainage systems.
4. Reglets and counterflashings.

B. Preinstallation Conference: Conduct conference at Project site.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roof specialties.
1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.

C. Samples: For each type of roof specialty and for each color and texture specified.

1.03 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For tests performed by a qualified testing agency.

B. Sample warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class and SPRI ES-1 tested to specified design pressure.

1.06 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. FM Approvals' Listing: Manufacture and install copings, roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with FM Approvals' markings.

B. SPRI Wind Design Standard: Manufacture and install copings, roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, material surfaces.

2.02 COPINGS

A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. ATAS International, Inc.
b. Hickman Company, W. P.
c. Metal-Fab Manufacturing, LLC.
2. Metallic-Coated Steel Sheet Coping Caps: Zinc-coated (galvanized) steel, nominal 0.028-inch thickness.
a. Surface: Smooth, flat finish.
b. Finish: Two-coat fluoropolymer.
c. Color: As selected by Architect from manufacturer's full range.
3. Corners: Factory mitered and continuously welded.
4. Coping-Cap Attachment Method: Snap-on or face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.
a. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.
b. Face-Leg Cleats: Concealed, continuous galvanized-steel sheet.

2.03 ROOF-EDGE DRAINAGE SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. ATAS International, Inc.
2. Castle Metal Products.
3. Cheney Flashing Company.
4. Hickman Company, W. P.
5. Metal-Era, Inc.
6. Metal-Fab Manufacturing, LLC.

B. Gutters: Manufactured in uniform section lengths not exceeding 12 feet, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch

above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.
2. Gutter Profile: As indicated according to SMACNA's "Architectural Sheet Metal Manual."
3. Corners: Factory mitered and continuously welded.
4. Gutter Supports: Manufacturer's standard supports as selected by Architect with finish matching the gutters.

C. Downspouts: Corrugated rectangular complete with machine-crimped elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.

D. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.

E. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout and built-in overflow.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.

F. Zinc-Coated Steel Finish: Two-coat fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

2.04 REGLETS AND COUNTERFLASHINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Fry Reglet Corporation.
2. Heckmann Building Products Inc.
3. Hickman Company, W. P.
4. Metal-Era, Inc.
5. Metal-Fab Manufacturing, LLC.

B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.
2. Corners: Factory mitered and continuously welded.
3. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.

C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal:

1. Zinc-Coated Steel: Nominal 0.022-inch thickness.

D. Accessories:

1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.

2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

E. Zinc-Coated Steel Finish: Two-coat fluoropolymer.
1. Color: As selected by Architect from manufacturer's full range.

2.05 MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.

2.06 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: ASTM D 1970/D 1970M; stable after testing at 240 deg F.
2. Low-Temperature Flexibility: ASTM D 1970/D 1970M; passes after testing at minus 20 deg F (29 deg C).
3. Products: Subject to compliance with requirements, provide one of the following:
a. Carlisle Coatings & Waterproofing; CCW WIP 300HT.
b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
c. Henry Company; Blueskin PE200 HT.
d. Metal-Fab Manufacturing, LLC; MetShield.
e. Owens Corning; WeatherLock Metal High Temperature Underlayment.

2.07 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
2. Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
3. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

B. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

PART 3 - EXECUTION

3.01 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches

staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

1. Apply continuously under copings, roof-edge specialties, and reglets and counterflashings.
2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

3.02 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.03 COPING INSTALLATION

A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.

3.04 ROOF-EDGE SPECIALITIES INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.05 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
   1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.
   1. Connect downspouts to underground drainage system indicated.

D. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

E. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper discharge.

3.06 REGLET AND COUNTERFLASHING INSTALLATION

A. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.

B. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.07 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 and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION

SECTION 07 7200

ROOF ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Roof curbs.
2. Equipment supports.
3. Roof hatches.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory indicated.

B. Shop Drawings: For custom-fabricated roof accessories.

C. Samples: For each exposed product and for each color and texture specified.

1.03 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items.

B. Warranty: Sample of special warranty.

1.04 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.05 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.
1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.

B. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.

2.02 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.

C. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.

D. Sealants: As recommended by roof accessory manufacturer for installation indicated.

2.03 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. AES Industries, Inc.
      b. Curbs Plus, Inc.
      c. Custom Solution Roof and Metal Products.
      d. Greenheck Fan Corporation.
      e. LM Curbs.
      f. Metallic Products Corp.
      g. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
      h. Pate Company (The).
      i. Roof Products, Inc.
      j. Safe Air of Illinois.
      k. Thybar Corporation.
      l. Vent Products Co., Inc.

B. Material: Zinc-coated (galvanized) steel sheet, 0.079 inch (2.01 mm) thick.
   1. Finish: Mill phosphatized.
   2. Color: As indicated by manufacturer's designations.

C. Construction:
   1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick cellulosic-fiber board insulation.
   2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
   3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.
   4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
   5. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
   6. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
   7. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.

2.04 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing and integrally formed deck-mounting flange at perimeter bottom.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. AES Industries, Inc.
      b. Babcock-Davis.
      c. Bilco Company (The).
      d. Bristolite Skylights.
      e. Custom Solution Roof and Metal Products.
      f. Dur-Red Products.
      g. Hi Pro International, Inc.
      h. J. L. Industries, Inc.
      i. Metallic Products Corp.
      j. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
      k. Naturalite Skylight Systems; Vistawall Group (The).
      l. Nystrom.
      m. O'Keeffe's Inc.
      n. Pate Company (The).
      o. Precision Ladders, LLC.

B. Type and Size: Single-leaf lid, 30 by 36 inches (750 by 900 mm).

C. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.

D. Hatch Material: Zinc-coated (galvanized) steel sheet, 0.079 inch (2.01 mm) thick.
   1. Finish: Mill phosphatized.
   2. Color: As indicated by manufacturer's designations.

E. Construction:
   1. Insulation: Glass-fiber board.
   2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
   3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
   4. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
   5. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.

F. Hardware: Galvanized-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
   1. The latch strike shall be a stamped component bolted to the curb assembly.
   2. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1 inch (25mm) diameter red vinyl grip handle to permit easy release for closing
   3. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed.
   4. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.

H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder. Post locks in place on full extension; release mechanism returns post to closed position.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
   1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
   2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
   3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
   4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
   1. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.

C. Seal joints with sealant as required by roof accessory manufacturer.

3.02 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."

C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 9200

JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
4. Acoustical 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 "C-1": One-part low modulus moisture cure silicone rubber sealant conforming to FS TT-S-001543A, Class A, FS TT-S-00230C, Type II, Class A and ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, G,A, and O, and capable of withstanding movement of 100 percent in extension and 50 percent in compression in service.
1) Dow Corning 790 Silicone Glazing Sealant
2) Tremco Spectrem 1
3) Pecora 890.
d. Type "C-2": One-part medium modulus neutral cure silicone rubber sealant conforming to FS TT-S-001543A, Class A, FS TT-S-00230C, Type II, Class A and ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, G,A, and O, and capable of withstanding movement of 50 percent in extension and 50 percent in compression in service.

1) Tremco Spectrem 2
2) Pecora 895
3) Dow Corning 795
4) Dow Corning 791
5) GE Silpruf.

e. 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.

f. Type "E": Silicone rubber sealant with mold inhibitor.
1) General Electric Sanitary 1700
2) Tremco Tremsil 200
3) Dow Corning 786
4) Pecora 898
5) Sonneborn Omni-Plus.

g. Type "F":
1) Tremco Acoustical Sealant
2) Pecora BA-98.

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. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.

G. 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. Horizontal traffic (concrete, tile, terrazzo and similar floor surfaces): Type "A". Provide gloss reducer.
2. Masonry, concrete to concrete, stucco, steel and wood: Type "B".
3. Glass (except insulating glass or special coated glass), aluminum, E.I.F.S., and plastics: Type "C-1".
4. Glass (including insulating glass or special coated glass), aluminum and plastics: Type "C-2".

B. Non-expanding Joints at:

1. Glass (except insulating glass or special coated glass), aluminum, E.I.F.S., and plastics: Type "C-1".
2. Glass (including insulating glass or special coated glass), aluminum and plastics: Type "C-2".
3. Concrete to concrete, stucco, masonry, aluminum, steel, and wood: Type "D".

C. Mechanical (ductwork and air conditioning): Type "D".

D. Plumbing Fixtures (around toilet, and kitchen fixtures): Type "E".

E. Acoustical (acoustical applications where sealant is required): Type "F".

END OF SECTION

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes hollow-metal work.

1.02 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required.

E. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.04 INFORMATIONAL SUBMITTALS

A. Product test reports.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Apex Industries, Inc.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.
4. MPI Group, LLC (The).
5. Republic Doors and Frames.
6. Steelcraft; an Allegion brand.

2.02 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable

to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.03 INTERIOR DOORS AND FRAMES

A. Standard-Duty Doors and Frames: SDI A250.8, Level 1. At locations indicated in the Door and Frame Schedule.
1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.032 inch (0.8 mm).
d. Edge Construction: Model 1, Full Flush.
e. Core: Kraft-paper honeycomb.
3. Frames:
a. Materials: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
b. Construction: Knocked-down.
4. Exposed Finish: Prime.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.
1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
d. Edge Construction: Model 1, Full Flush.
e. Core: Kraft-paper honeycomb.
3. Frames:
a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
b. Construction: Full profile welded.
4. Exposed Finish: Prime.
5. Frames:
a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
b. Construction: Full profile welded.
6. Exposed Finish: Prime.

2.04 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.
1. Physical Performance: Level B according to SDI A250.4.
2. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.

d. Edge Construction: Model 1, Full Flush.
e. Core: Manufacturer's standard insulation material.

3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

4. Frames:
   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
   b. Construction: Full profile welded.

5. Exposed Finish: Prime.

2.05 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

2.06 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).

I. Glazing: Section 08 8000 "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.07 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:
1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:
a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:
1) Two anchors per jamb up to 60 inches (1524 mm) high.
2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
1) Three anchors per jamb up to 60 inches (1524 mm) high.
2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
c. Compression Type: Not less than two anchors in each frame.
d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.

6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
   b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
   1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
   2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
   1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
   2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
   3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
   4. Provide loose stops and moldings on inside of hollow-metal work.
   5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.08 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
   1. Shop Primer: SDI A250.10.

2.09 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
   1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
      a. At fire-rated openings, install frames according to NFPA 80.
      b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

c. Install frames with removable stops located on secure side of opening.
d. Install door silencers in frames before grouting.
e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
   a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
   a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
   c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
   a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
   b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
   c. At Bottom of Door: 3/4 inch (19.1 mm) plus or minus 1/32 inch (0.8 mm).
   d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

C. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.02 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 3113

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Access doors and frames for walls and ceilings.
2. Floor access doors and frames.
3. Pull-down ladder attic access.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each door face material.

D. Schedule: Types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

E. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer (postindustrial) recycled content. Include statement indicating cost for each product having recycled content.

F. Product Data for Credit MR 5: For products and materials required to comply with requirements for regional materials, statement from manufacturer indicating location of material manufacture and point of extraction, harvest or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 tested according to the following test method:
1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.02 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:

1. Acudor Products, Inc.
2. Babcock-Davis.
3. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
4. Larsen's Manufacturing Company.
5. Milcor Inc.
6. Nystrom, Inc.

C. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

D. Flush Access Doors with Exposed Flanges:
1. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.
2. Locations: Wall and ceiling.
3. Door Size:
4. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage.
   a. Finish: Factory finish.
5. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch (1.63 mm), 16 gage.
   a. Finish: Factory finish.
6. Frame Material: Same material, thickness, and finish as door.
7. Hinges: Manufacturer's standard.
8. Hardware: Latch.

E. Hardware:
1. Latch: Cam latch with interior release.

2.03 PULL-DOWN LADDER ATTIC ACCESS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
1. Precision Ladders, LLC.
2. Or pre-approved equal capable of spanning floor-to-floor height indicated on drawing.

B. Pull-down ladder attic access:
1. Provide 1/8” steel deep box frame extension spanning drop ceiling to attic floor level. Provide treads in box frame as required with same load rating as ladder, minimum.
2. Ladder: Aluminum construction with serrated treads. Provide fold-assist.
3. Load Rating: 500 pounds.
4. Ladder dimensions: 20” W, 9-1/2” riser height.
5. Floor-to-floor height: Refer to Drawings.

2.04 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

C. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

E. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

F. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

G. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of Alloy 5005-H15; with minimum sheet thickness according to ANSI H35.2 (ANSI H35.2M).

H. Frame Anchors: Same type as door face.

I. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.05 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.

D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.

E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
   1. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

F. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

2.06 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Steel and Metallic-Coated-Steel Finishes:

1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
2. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

E. Aluminum Finishes:
1. Mill finish.
2. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.02 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08 3613

SECTIONAL DOORS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes electrically operated sectional doors.

1.02 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

C. Samples: For each exposed product and for each color and texture specified.

1.03 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 QUALITY ASSURANCE

A. Wood Sectional Door Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1.06 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 DOOR ASSEMBLY

A. Steel Sectional Door: Sectional door formed with hinged sections and fabricated according to DASMA 102 unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. C.H.I. Overhead Doors.
   b. Clopay Building Products.
   c. Overhead Door Corporation.
   d. Raynor.
   e. Rite-Hite Corporation.
   f. Wayne-Dalton Corp.
   g. Windsor Door.

2. Basis of Design Product: Overhead Door Model 432 Insulated Flush Exterior Steel Overhead Door.

B. Operation Cycles: Door components and operators capable of operating for not less than 50,000.

C. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. (0.406 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h) when tested according to ASTM E 283.

D. R-Value: Up to 10.0.

E. Steel Sections: Zinc-coated (galvanized) steel sheet with a minimum G60 (Z180) zinc coating.
   1. Section Thickness: 2 inches (51 mm).
   2. Exterior-Face Surface: Flat.
   3. Interior Facing Material: Manufacturer's standard material.

F. Track Configuration: Lift clearance track.

G. Weatherseals: Fitted to bottom and top and around entire perimeter of door.

H. Electric Door Operator:
   1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
   2. Operator Type: Jackshaft, side mounted.
   3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet (2.4 m) or lower.
   4. Motor Exposure: Interior, clean, and dry.
   5. Emergency Manual Operation: Chain type.
   6. Obstruction-Detection Device: Automatic photoelectric sensor.
   7. Operator Controls:
      a. Pushbutton operated control stations at interior locations where indicated on the drawings.

I. Door Finish:
   1. Baked-Enamel or Powder-Coat Finish: Color and gloss matching Architect's sample.
   2. Factory Prime Finish: Manufacturer's standard color.
   3. Finish of Interior Facing Material: Finish as indicated by manufacturer's designations.

2.02 STEEL DOOR SECTIONS

A. Exterior Section Faces and Frames: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet.
   1. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weather-resistant seal, with a reinforcing flange return.
   2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.

B. Section Ends and Intermediate Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet welded to door section. Provide intermediate stiles formed from galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches (1219 mm) apart.

C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile and allowing installation of astragal.

D. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place.

E. Provide reinforcement for hardware attachment.

F. Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free insulation, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

2.03 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances indicated on Drawings, Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides for required door type, size, weight, and loading.
   1. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches (51 mm) apart for door-drop safety device.

B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

2.04 HARDWARE

A. General: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.

B. Hinges: Heavy-duty, galvanized-steel hinges at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails.

C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Provide 3-inch- (76-mm-) diameter roller tires for 3-inch- (76-mm-) wide track and 2-inch- (51-mm-) diameter roller tires for 2-inch- (51-mm-) wide track.

2.05 COUNTERBALANCE MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.

B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft.

C. Cables: Galvanized-steel, multistrand, lifting cables.

D. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.

E. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

F. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

2.06 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following or as supplied by door manufacturer:
      a. Chamberlain Group, Inc. (The).
   2. Comply with NFPA 70.
   3. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.

D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.
   1. Electrical Characteristics:
      a. Phase: Three phase
      b. Volts: 208 V. Verify with electrical documents.
      c. Hertz: 60.

2. Motor Size: 1 Horsepower.
3. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.

E. Obstruction Detection Device: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.
1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.
2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom section. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
a. Self-Monitoring Type: Four-wire configured device designed to interface with door-operator control circuit to detect damage to or disconnection of sensor edge.

F. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure, push-button control labeled "Close."
1. Interior Mounted Units: Final location (interior or exterior) to be determined by Owner and Architect.

G. Emergency Manual Operation: Equip electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).

H. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

I. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

J. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Tracks: Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Power-Operated Doors: Install automatic garage doors openers according to UL 325.

E. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

F. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780/A 780M.

3.02 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION

SECTION 08 4213

ALUMINUM-FRAMED ENTRANCES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Exterior manual-swing entrance doors and door-frame units.
2. Interior manual-swing entrance doors and door-frame units.
3. Sidelights.
4. Transoms.

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: Include plans, elevations, sections, full-size details, and attachments to other work.
1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples: For each exposed finish required.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

1.04 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values for each aluminum-framed entrance.

B. Product test reports.

C. Field quality-control reports.

D. Sample warranties.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025.

1.07 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Structural Loads:
   1. Wind Loads: As indicated on Drawings.

C. Structural: Test according to ASTM E 330 as follows:
   1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
   2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
   3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

D. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
   1. Entrance Doors:
      a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbs./sq. ft. (75 Pa).
      b. Single Doors: Maximum air leakage of 0.3 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbs./sq. ft. (75 Pa).

E. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
   1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbs./sq. ft. (300 Pa).

F. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.02 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer TriFab 451UT Entrance Framing with Flushline swinging doors, or comparable product by one of the following:
   1. Arcadia, Inc.
   2. EFCO Corporation.
   3. Kawneer North America.
   4. Oldcastle BuildingEnvelope.
   5. Pittco Architectural Metals, Inc.
   6. TRACO.
   7. Tubelite.
   8. United States Aluminum.
   9. YKK AP America Inc.

2.03 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
   1. Door Construction: 1-3/4-inch (44.5-mm) overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
      a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
   2. Door Design: Wide stile and top rails, 7-inch (178-mm) nominal width; 12-inch (305 mm) bottom rail.
   3. Glazing Stops and Gaskets: Beveled snap-on, extruded-aluminum stops and preformed gaskets.
      a. Provide nonremovable glazing stops on outside of door.

B. Framing Members: Manufacturer's standard extruded aluminum, minimum 0.125 inch (3.2 mm) thick and reinforced as required to support imposed loads.
   1. Nominal Size: 1-3/4 by 4-1/2 inches (45 by 115 mm).

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

E. Materials:
   1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
      a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
      b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
      c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
      d. Structural Profiles: ASTM B 308/B 308M.
   2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
      a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
      b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.

c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.04 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 08 7100 "Door Hardware."

B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door to comply with requirements in this Section.
1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
3. Opening-Force Requirements:
a. Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N)to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width.
b. Accessible Interior Doors: Not more than 5 lbf (22.2 N) to fully open door.

C. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:
1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in "Entrance Door Hardware Sets" Article.
2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

D. Butt Hinges: BHMA A156.1, Grade 1, radius corner.
1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while entrance door is closed.
2. Exterior Hinges: Stainless steel, with stainless-steel pin.
3. Quantities:
a. For doors up to 87 inches (2210 mm) high, provide three hinges per leaf.
b. For doors more than 87 and up to 120 inches (2210 and up to 3048 mm) high, provide four hinges per leaf.

E. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.

F. Manual Flush Bolts: BHMA A156.16, Grade 1.

G. Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1.

H. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

I. Cylinders: As specified in Section 08 7100 "Door Hardware."
1. Keying: Master key system. Permanently inscribe each key with a visual key control number and include notation to be furnished by Owner.

J. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.

K. Operating Trim: BHMA A156.6.

L. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.

M. Surface-Mounted Holders: BHMA A156.16, Grade 1.

N. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.

O. Weather Stripping: Manufacturer's standard replaceable components.

P. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

Q. Silencers: BHMA A156.16, Grade 1.

R. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch (12.7 mm).

2.05 GLAZING

A. Glazing: Comply with Section 08 8000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

D. Sealants used inside the weatherproofing system shall have a VOC content of 250 g/L.

2.06 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

E. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

F. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.07 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install glazing as specified in Section 08 8000 "Glazing."

F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.02 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Field Quality-Control Testing: Perform the following test on aluminum-framed entrances.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

C. Aluminum-framed entrances will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION

SECTION 08 5213

METAL CLAD WOOD WINDOWS

GENERAL

1.01 SECTION INCLUDES

A. Aluminum Clad Wood Windows of the Following Types:
   1. Casement windows.
   2. Fixed windows.

1.02 RELATED SECTIONS

A. Section 07 92 00 - Joint Sealants.

B. Section 08 80 00 – Glazing

1.03 REFERENCES

A. American Architectural Manufacturer Association (AAMA):
   1. ANSI/AAMA/NWWDA 101/I.S.2 /NAFS; Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
   2. AAMA 2603; Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

B. National Fenestration Rating Council (NFRC):
   1. NFRC 100; Procedure for Determining Fenestration Thermal Properties.
   2. NFRC 200; Solar Heat Gain Coefficient and Visible Transmittance.

C. Window & Door Manufacturers Association (WDMA):
   1. WDMA I.S.4; Water Repellent Preservative Non-Pressure Treatment for Millwork.

1.04 DESIGN REQUIREMENTS

A. Provide windows complying with requirements indicated, based on testing manufacturer's window that are representative of those specified and that are of test size required by AAMA/WDMA/CSA/101/I.S.2/A440.

B. Structural Requirements: Provide windows complying with requirements indicated:
   1. Design pressure: As indicated on drawings.

C. NFRC Requirements:
   1. Refer to Section 08 80 00 – Glazing

D. Air Leakage Requirements:
   1. Air infiltration rates not exceeding 0.3 cfm/sq. ft. of window area when tested according to NFRC-400 or ASTM E 283 at a pressure differential of 1.57 lbs./sq. ft. (75 pascals).

1.05 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Submit shop drawings indicating details of construction, flashings and relationship with adjacent construction.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

E. Quality Assurance Submittals:
1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.

F. Closeout Submittals: Refer to Section 01 70 00 - Execution and Closeout Requirements.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 2 years installing similar assemblies.

B. Mock-Up: Provide a mock-up for evaluation of installation techniques and workmanship.
1. Window mock-up shall incorporate surrounding construction, including wall assembly fasteners, flashing, and other related accessories installed in accordance with window manufacturer's approved installation methods.
2. Do not proceed with remaining work until workmanship is approved by Architect.
3. Rework mock-up as required to produce acceptable work.
4. Mock-up may not remain as part of the work.
5. Mock-up may remain as part of the work.

C. Pre-installation Meeting: Conduct pre-installation meeting on-site two weeks prior to window installation start.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver windows materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Store windows as recommended by manufacturer.

1.08 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.09 WARRANTY

A. Manufacturer standard warranty indicating that the window unit will be free from material and workmanship defects from the date of substantial completion for the time periods indicated below:
1. Window Unit: 20 years.
2. Cladding Finish: 10 years against peeling, checking, cracking caulk or color change.
3. Insulated Glass: 20 years against seal breakage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Andersen.
   2. Jeld-Wen.
   3. Lincoln.
   4. Marvin.
   5. Milgard.
   6. Pella.

B. Substitutions: Allowed with pre-approval.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.02 MANUFACTURED UNITS

A. Basis of Design: Windows are based on Andersen 400 Clad-Wood Windows.

2.03 MATERIALS

A. Exterior Wood: Western Pine, preservative treated in accordance with WDMA I.S.4.

B. Interior Wood: Western Pine.

2.04 MANUFACTURED UNITS

A. Frame:
   1. Select kiln-dried pine pressure-treated wood.
   2. Cladding: 0.045 to.060 inch (1.27 to1.52 mm) extruded aluminum.
   3. Jamb Width: 4-9/16 inch (116mm).

B. Sash:
   1. Select kiln-dried pine pressure-treated wood.
   2. Cladding: 0.024 inch (0.61mm) roll-formed aluminum.
   3. Sash Thickness - Awning Windows: 1-11/32 inches (34 mm)
   4. Sash Thickness - Casement Windows: 1-11/32 inches (34 mm)
   5. Sash Thickness - Double-Hung Wood Traditional 1-9/32 inches (33 mm).
   6. Sash Thickness - Double-Hung: 1-11/32 inches (34 mm). Standard.
   7. Sash Thickness - Transom 1-7/16 inches (37 mm).
   8. Sash Thickness - Double-Hung picture windows are direct sets.

C. Exterior Trim:
   1. Nailing Fin: Integral extruded aluminum on all four sides of frame.

D. Factory Applied Extension Jambs: Provide on four sides of frame interior.
   1. Casement Windows: From 3-3/16 inches up to 10-9/16 inches (81 mm to 268 mm) as scheduled or indicated.
   2. Fixed Windows: From 3-3/16 inches up to 10-9/16 inches (81 mm to 268 mm) as scheduled or indicated.

E. Weatherstripping:
   1. Casement: Rigid vinyl leaf at top and sides of sash. TPE bulb at frame.
      a. Jamb Liner Color: Standard white.

F. Hardware:
1. Casement Windows as scheduled or indicated.
a. Hinges: Concealed.
b. Operator: Stainless Steel Dual Arm.
1) Casement: Stainless steel dual arm or split arm.
2) Awning: Stainless steel scissor type.
c. Lock: Concealed.
d. Handle Profile: Manual Folding Crank.
e. Lock and Handle Finish: As selected by Architect from Manufacturer's standard colors.

G. Glazing:
a. Refer to Section 08 80 00 – Glazing.

2.05 WINDOW ACCESSORIES

A. Interior Insect Screen:
1. Material: Charcoal fiberglass screen cloth (20 by 20 mesh) set in painted roll formed aluminum frame.
2. Finish Color: As selected by Architect from Manufacturer's standard colors.
3. Full Surround and KD Wood Grilles:
a. Material: Unfinished clear pine.
b. Pattern: Modified OGEE.
c. Width: 7/8 inch (22 mm).

2.06 CONSTRUCTION ACCESSORIES

A. Flashing:
1. Refer to Section 07 62 00 - Flashing and Sheet Metal.

B. Sealants:
1. Refer to Section 07 92 00 - Joint Sealants.

2.07 FABRICATION

A. General: Aluminum cladding overlapped at sash corners.

B. Casement Windows:
1. Frame: Corner joints are injected with sealant over reinforced nylon corner lock.
2. Sash: Corner joints mortise-and-tenon, and mechanically fastened.
3. Glass: Mounted using silicone glazing compound.

2.08 FINISH

A. Interior Finish:
1. Stain finish: As selected by Architect from Manufacturer's standard colors.

B. Exterior:
1. Frame: .045-.060 thick extruded aluminum cladding with thermo set polyester finish in accordance with AAMA #2603.
2. Sash: 0.024 inch thick roll-formed aluminum cladding with thermo set polyester finish.
3. Standard Sash:
a. Color: As selected by Architect from Manufacturer's standard colors.
4. Traditional Sash:
a. Color: As selected by Architect from Manufacturer's standard colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect window prior to installation. Inspect rough opening for compliance with window manufacturer recommendations. Verify rough opening conditions are within recommended tolerances.

3.02 PREPARATION

A. Prepare windows for installation in accordance with manufacturer's recommendations.

3.03 INSTALLATION

A. Install windows in accordance with manufacturer's installation guidelines and recommendations Comply with manufacturer's published instructions for installation type. Install in proper relationship with adjacent work.

3.04 FIELD QUALITY CONTROL

A. Manufacturers' Field Services: Field inspections.

3.05 CLEANING

A. Remove Preserve film from glass. Clean the exterior surface and glass with mild soap and water.

3.06 PROTECTION

A. Protect installed windows from damage.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY:

A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.

1. Door hardware for steel (hollow metal) doors.
2. Door hardware for aluminum doors.
3. Door hardware for wood doors.
4. Door hardware for other doors indicated.
5. Keyed cylinders as indicated.

B. Related Sections:

1. Division 6: Rough Carpentry.
2. Division 8: Aluminum Doors and Frames
3. Division 8: Hollow Metal Doors and Frames.
4. Division 8: Wood Doors.
5. Division 26 Electrical
6. Division 28: Electronic Security

C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.

1. Builders Hardware Manufacturing Association (BHMA)
2. NFPA 101 Life Safety Code
3. NFPA 80 -Fire Doors and Windows
4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
5. UL10C – Positive Pressure Fire Test of Door Assemblies
6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
8. ICC – International Building Code

D. Intent of Hardware Groups

1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.

E. Allowances

1. Refer to Division 1 for allowance amount and procedures.

F. Alternates

1. Refer to Division 1 for Alternates and procedures.

1.02 SUBSTITUTIONS:

A. Comply with Division 1.

1.03 SUBMITTALS:

A. Comply with Division 1.

B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.

C. Product Data: Manufacturer's specifications and technical data including the following:

1. Detailed specification of construction and fabrication.
2. Manufacturer's installation instructions.
3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
4. Submit 6 copies of catalog cuts with hardware schedule.
5. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2

D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.

1. List groups and suffixes in proper sequence.
2. Completely describe door and list architectural door number.
3. Manufacturer, product name, and catalog number.
4. Function, type, and style.
5. Size and finish of each item.
6. Mounting heights.
7. Explanation of abbreviations and symbols used within schedule.
8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.

E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.

1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.

F. Samples: (If requested by the Architect)

1. 1 sample of Lever and Rose/Escutcheon design, (pair).
2. 3 samples of metal finishes

G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.

1. Operating and maintenance manuals: Submit 3 sets containing the following.

    a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
    b. Catalog pages for each product.
    c. Name, address, and phone number of local representative for each manufacturer.
    d. Parts list for each product.

2. Copy of final hardware schedule, edited to reflect, "As installed".
3. Copy of final keying schedule
4. As installed “Wiring Diagrams” for each piece of hardware connected to power, both low voltage and 110 volts.
5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.04 QUALITY ASSURANCE

A. Comply with Division 1.

1. Statement of qualification for distributor and installers.
2. Statement of compliance with regulatory requirements and single source responsibility.
3. Distributor's Qualifications: Firm with 3 years' experience in the distribution of commercial hardware.

    a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
    b. Hardware Schedule shall be prepared and signed by an AHC.

4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.

    a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
    b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.

6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Comply with Division 1.

1. Deliver products in original unopened packaging with legible manufacturer's identification.
2. Package hardware to prevent damage during transit and storage.
3. Mark hardware to correspond with "reviewed hardware schedule".

4. Deliver hardware to door and frame manufacturer upon request.

B. Storage and Protection: Comply with manufacturer's recommendations.

1.06 PROJECT CONDITIONS:

A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.

B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.07 WARRANTY:

A. Refer to Conditions of the Contract

B. Manufacturer’s Warranty:

1. Closers: Lifetime
2. Exit Devices: Five Years
3. Locksets & Cylinders: Ten years
4. All other Hardware: Two years.

1.08 OWNER’S INSTRUCTION:

A. Instruct Owner’s personnel in operation and maintenance of hardware units.

1.09 MAINTENANCE:

A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.

1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
3. Delivery, Storage and Protection: Comply with Owner’s requirements for delivery, storage and protection of extra service materials.

B. Maintenance Service: Submit for Owner’s consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

Item:	Manufacturer:	Approved:

Hinges	Stanley	Bommer
Continuous Hinges	Stanley	Select, ABH
Locksets	Best	No Substitution
Cylinders	Best	No Substitution
Exit Devices	Precision	No Substitution
Closers	Stanley QDC	LCN 4040XP
Push/Pull Plates	Trimco	Hager, Don Jo
Push/Pull Bars	Trimco	Hager, Don Jo
Protection Plates	Trimco	Hager, Don Jo
Overhead Stops	ABH	Rixson, Glynn Johnson
Door Stops	Trimco	Hager, Don Jo
Flush Bolts	Trimco	Hager, Don Jo
Coordinator & Brackets	Trimco	Hager, Don Jo
Threshold & Gasketing	National Guard	Reese, Pemko

2.02 MATERIALS:

A. Hinges: Shall be Five Knuckle Ball bearing hinges

1. Template screw hole locations
2. Bearings are to be fully hardened.
3. Bearing shell is to be consistent shape with barrel.
4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
5. Equip with easily seated, non-rising pins.
6. Non Removable Pin screws shall be slotted stainless steel screws.
7. Hinges shall be full polished, front, back and barrel.
8. Hinge pin is to be fully plated.
9. Bearing assembly is to be installed after plating.
10. Sufficient size to allow 180-degree swing of door
11. Furnish five knuckles with flush ball bearings
12. Provide hinge type as listed in schedule.
13. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
15. UL10C listed for Fire rated doors.

B. Geared Continuous Hinges:

1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
2. Anti-spinning through fastener
3. UL10C listed for 3 hour Fire rating
4. Non-handed
5. Lifetime warranty
6. Provide Fire Pins for 3-hour fire ratings
7. Sufficient size to permit door to swing 180 degrees

C. Cylindrical Type Locks and Latchsets:

1. Tested and approved by BHMA for ANSI A156.2, Series 4000, Operational Grade 1, Extra-Heavy Duty, and be UL10C listed.
2. Provide 9001-Quality Management and 14001-Environmental Management.

3. Fit modified ANSI A115.2 door preparation.
4. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
5. Locksets to have anti-rotational studs that are thru-bolted
6. Keyed lever shall not have exposed “keeper” hole
7. Each lever to have independent spring mechanism controlling it
8. 2-3/4 inch (70 mm) backset
9. 9/16 inch (14 mm) throw latchbolt
10. Provide sufficient curved strike lip to protect door trim
11. Outside lever sleeve to be seamless, of one-piece construction made of a hardened steel alloy
12. Keyed lever to be removable only after core is removed, by authorized control key
13. Provide locksets with 7-pin removable and interchangeable core cylinders
14. Hub, side plate, shrouded rose, locking pin to be a one-piece casting with a shrouded locking lug.
15. Locksets outside locked lever must withstand minimum 1400 inch pounds of torque. In excess of that, a replaceable part will shear. Key from outside and inside lever will still operate lockset.
16. Core face must be the same finish as the lockset.
17. Functions and design as indicated in the hardware groups.

D. Exit Devices with Weatherized True Architectural Finish 626W:

1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
2. Exit devices to be tested and certified by UL or by a recognized independent laboratory to meet or exceed the following :
   A. Mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
   B. BHMA 156.3 – A156.18 Salt Spray Certified 600 Hours 3 X Standard.
   C. MIL-STD-810G 509.6 Salt Fog Certified.
   D. MIL-STD-810G 510.6 Sand & Dust Certified.
   E. MIL-STD-810G 521.4 Icing/Freezing Rain Certified.
3. Exit devices chassis to be investment cast steel, zinc dichromate.
4. Exit devices to have stainless steel deadlocking ¾” through latch bolt.
5. Exit devices to be equipped with sound dampening on touchbar.
6. Non-fire rated exit devices to have cylinder dogging.
7. Non-fire rated exit devices to have ¼” minimum turn hex key dogging.
8. All Exterior components of the exit device including the Active case cover, Touch bar, device channel, slide channel fillers, Vertical rods, latch covers and device end cap, shall be constructed of a brass base metal then plated in a double dip two-step process of satin nickel and chrome.
9. Exit device shall be available with options of WTS Weatherized touch bar switch and WALW Weatherized Exit alarm (hardwired)
10. Additional non-weatherized electrified options are compatible with the 626W. Non-weatherized options are not recommended for harsh environments.
11. Touchpad to be “T” style constructed.
12. Touchbar assembly on wide style exit devices to have a ¼” clearance to allow for vision frames.
13. All exposed exit device components to be of architectural metals and “true” architectural finishes.
14. Provide strikes as required by application.
15. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
16. The strike is to be black powder coated finish.
17. Exit devices to have field reversible handing.

18. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
19. Provide 9001-Quality Management and 14001-Environmental Management.
20. Vertical Latch Assemblies to have gravity operation, no springs.
21. Approved Manufacturers
    a. The following manufacturers will be approved contingent on meeting or exceeding the above performance criteria:
        1) Precision with 626W finish, Manufactured by Stanley Security Solutions

E. Cylinders:

1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
3. Coordinate and provide as required for related sections.

F. Door Closers shall:

1. Tested and approved by BHMA for ANSI 156.4, Grade 1
2. UL10C certified
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Closer shall have extra-duty arms and knuckles
5. Conform to ANSI 117.1
6. Maximum 2 7/16 inch case projection with non-ferrous cover
7. Separate adjusting valves for closing and latching speed, and backcheck
8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
9. Full rack and pinion type closer with 1½" minimum bore
10. Mount closers on non-public side of door, unless otherwise noted in specification
11. Closers shall be non-handed, non-sized and multi-sized.

G. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.

1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
2. Provide fastener suitable for wall construction.
3. Coordinate reinforcement of walls where wall stop is specified.
4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered

H. Over Head Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.

1. Concealed overhead stops shall be heavy duty bronze or stainless steel.
2. Surface overhead stops shall be heavy duty bronze or stainless steel.

I. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, and size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.

J. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plate s with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.

K. Push Pull Bars: Provide ANSI J504, .1" Dia. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.

L. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

M. Mop plates: Provide with four beveled edges ANSI J103, 4 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

N. Door Bolts: Flush bolts for wood or metal doors.

1. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
2. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 27 at wood label doors.
3. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
4. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.

O. Coordinator and Brackets: Provide a surface mounted coordinator when automatic bolts are used in the hardware set.

1. Coordinator, Certified ANSI/BHMA A1156.3 Type 21A for full width of the opening.
2. Provide mounting brackets for soffit applied hardware.
3. Provide hardware preparation (cutouts) for latches as necessary.

P. Electric Door Strike: Certified by ANSI/BHMA 156.31, Grade 1 and listed for Burglary Protection ANSI/ UL1034 Grade 1.

1. For General use provide fail-secure electric strike and with fire-rated device.
2. Listed UL10C for Fire Door assemblies
3. Latchbolt monitor switch option when specified in hardware sets.
4. Provide the electric strike in the appropriate model that will accept a 5/8” or 3/4" latchbolt.

Q. Door Position Switch: Provide door position switch for door status monitoring as indicated in hardware sets.

1. At all fired rated doors the door and frames, position switch preparation will be provided by the door and frame manufacturer or by an authorized label service agent.

R. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

S. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.

1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
2. UL10C Positive Pressure rated seal set when required.

T. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.

1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
2. UL10C Positive Pressure rated seal set when required.

U. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.

2.03 FINISH:

A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products

B. Powder coat door closers to match other hardware, unless otherwise noted.

C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.04 KEYS AND KEYING:

A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.

B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.

C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."

D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.

E. Furnish keys in the following quantities:

1. 1 each Grand Masterkeys
2. 4 each Masterkeys
3. 2 each Change keys each keyed core
4. 15 each Construction masterkeys
5. 1 each Control keys

F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.

G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.

1. Do not proceed until unsatisfactory conditions have been corrected.

3.02 HARDWARE LOCATIONS:

A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.

1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).

2. Recommended locations for Architectural Hardware for flush wood doors (DHI).

3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.03 INSTALLATION:

A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

B. Conform to local governing agency security ordinance.

C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.

1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.

D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.04 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.

1. Check and adjust closers to ensure proper operation.

2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.

a. Verify levers are free from binding.
b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.

3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.05 SCHEDULE OF FINISH HARDWARE:

Manufacturer List

Code	Name
AB	ABH Manufacturing Inc.
BE	Best Access Systems
BY	By Others
NA	National Guard
PR	Precision
RC	RCI
SD	Stanley Door Closers
SH	Stanley Commercial Hardware
ST	Stanley
TR	Trimco

Finish List

Code	Description
AL	Aluminum
32D	Satin Stainless Steel
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull

Option List

Code	Description
CD	Cylinder Dogging
LM	Lost Motion
B4E	Beveled 4 Edges
CSK	Counter Sunk Screw Holes

Hardware Sets

SET #1

Doors: 100A

1	Continuous Hinge	661HD UL	AL	ST
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Electric Strike	4104-08	32D	RC
1	Door Closer - Cush Stop	QDC119	689	SH
1	Spacer Block	P45HD-110	689	SD
1	Card Reader	by Owners Security Vendor		BY
1	Integral Seals	by Door Mfg.		BY
1	Handicap Threshold	513A	AL	NA

NOTE: Presenting authorized credentials releases electric strike allowing access. Relocks upon closing. Egress allowed at all times.

SET #2

Doors: 100B

1	Continuous Hinge	661HD UL	AL	ST
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Electric Strike	4104-08	32D	RC
1	Door Closer - Cush Stop	QDC119	689	SH
1	Spacer Block	P45HD-110	689	SD
1	Card Reader	by Owners Security Vendor		BY
1	Integral Seals	by Door Mfg.		BY
1	Handicap Threshold	513A	AL	NA

NOTE: Presenting authorized credentials releases electric strike allowing access. Relocks upon closing. Egress allowed at all times. Provide a buzzer in room 103 Clerk Workstation to grant authorized personel access. Install key side of lock on lobby side of door.

SET #3

Doors: 110A, 116A, 117A, 121A, 200A

3	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Electric Strike	4114-08	32D	RC
1	Door Closer - Cush Stop	QDC119	689	SH
1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Card Reader	by Owners Security Vendor		BY

1	Weatherstrip	160SA Head & Jambs		NA
1	Door Sweep	200NA		NA
1	Handicap Threshold	513A	AL	NA

NOTE: Presenting authorized credentials releases electric strike allowing access. Relocks upon closing. Egress allowed at all times.

SET #4

Doors: 109A, 201A, 213A, 214B

3	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Door Closer - Cush Stop	QDC119	689	SH
1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Weatherstrip	160SA Head & Jambs		NA
1	Door Sweep	200NA		NA
1	Handicap Threshold	513A	AL	NA

SET #5

Doors: 119A, 120A

3	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Overhead Stop	4420 Series	US32D	AB
1	Weatherstrip	160SA Head & Jambs		NA
1	Door Sweep	200NA		NA
1	Handicap Threshold	513A	AL	NA

SET #6

Doors: 118A

3	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Electric Strike	4114-08	32D	RC
1	Door Closer - Rw/PA	QDC111	689	SH
1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Wall Bumper	1270CVSV	626	TR
1	Card Reader	by Owners Security Vendor		BY
1	Gasketing	5050B Head & Jambs		NA

NOTE: Presenting authorized credentials releases electric strike allowing access. Relocks upon closing. Egress allowed at all times.

SET #7

Doors: 101A, 101B, 110B

3	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Passage Set	9K3-0N15D	626	BE
1	Door Closer - Rw/PA	QDC111	689	SH

1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Wall Bumper	1270CVSV	626	TR
1	Gasketing	5050B Head & Jambs		NA

SET #8

Doors: 105A, 106A, 113A, 114A, 115A, 206A

3	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Lockset - Office	9K3-7AB15D PATD	626	BE
1	Wall Bumper	1270CVSV	626	TR
1	Gasketing	5050B Head & Jambs		NA

SET #9

Doors: 123A, 125A

3	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Pull Plate	1056-4	630	TR
1	Door Closer - Rw/PA	QDC111	689	SH
1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Push Plate	1041-4	630	TR
1	Wall Bumper	1270CVSV	626	TR
1	Gasketing	5050B Head & Jambs		NA

SET #10

Doors: 111A

3	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Indicator Deadlock	QDB285	626	SH
1	Privacy Set	9K3-0L15D	626	BE
1	Door Closer - Rw/PA	QDC111	689	SH
1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Wall Bumper	1270CVSV	626	TR
1	Gasketing	5050B Head & Jambs		NA

SET #11

Doors: 112A, 127A, 202A

3	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Lockset - Classroom	9K3-7R15D PATD	626	BE
1	Wall Bumper	1270CVSV	626	TR
1	Gasketing	5050B Head & Jambs		NA

SET #12

Doors: 104A

3	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1	Lockset - Classroom	9K3-7R15D PATD	626	BE
1	Overhead Stop	4420 Series	US32D	AB
1	Gasketing	5050B Head & Jambs		NA

SET #13

Doors: 107A

3	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1	Lockset - Office	9K3-7AB15D PATD	626	BE
1	Door Closer - Cush Stop	QDC119	689	SH
1	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1	Gasketing	5050B Head & Jambs		NA

SET #14

Doors: 203A

6	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
2	Flush Bolt	3917-12	626	TR
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Door Closer - Cush Stop	QDC119	689	SH
1	Overhead Stop	4420 Series	US32D	AB
2	Kick Plate	K0050 10" x 1" LDW B4E CSK	630	TR
1	Weatherstrip	160SA Head & Jambs		NA
1	Astragal	158NA		NA
2	Door Sweep	200NA		NA
1	Handicap Threshold	513A	AL	NA

SET #15

Doors: 201B

6	Hinges	FBB179 4 1/2 X 4 1/2	US26D	ST
1	Flush Bolt	3917-12 (Top Bolt Only)	626	TR
1	Lockset - Storeroom	9K3-7D15D PATD LM	626	BE
1	Overhead Stop	4420 Series	US32D	AB
1	Wall Bumper	1270CVSV	626	TR
1	Gasketing	5050B Head & Jambs		NA
1	Astragal	158NA		NA

SET #16

Doors: 201C, 211A, 212A, 214A, 214C

1	Padlock	41B-722L PATD	626	BE

NOTE: Balance of hardware by Overhead Sectional Door supplier.

SET #17

Gates: 001E, 001F, 002A

1	Padlock	41B-722L PATD	626	BE

NOTE: Balance of hardware by gate mfg.

SET #18

Gates: 001C, 001D

1	Exit Device	ELR WTS 2103 X 4903A CD SEC SNB	626W	PR
1	Rim Cylinder	12E-72 PATD	626	BE
1	Mortise Cylinder	1E-74 PATD	626	BE
1	Power Transfer	EPT-2		PR
1	Power Supply	ELR 151 BT Series		PR
1	Card Reader	By Owner Security Vendor		BY
1	Exterior Electrical Box	By Electrical Contractor		BY

NOTE: Balance of hardware and mounting plates by gate supplier. Presenting authorized credentials releases lock and retracts bolt in exit device allowing access. Relocks upon closing. Egress allowed at all times. Pushing panic bar activates touch bar sensor and shunts alarm allowing egress.

SET #19

Gates: 002B

3	Hinges	FBB179 4 1/2 X 4 1/2 NRP	US26D	ST
1	Exit Device	2103 X 4903A CD	626W	PR
1	Rim Cylinder	12E-72 PATD	626	BE
1	Mortise Cylinder	1E-74 PATD	626	BE
1	Overhead Stop	4420 Series	US32D	AB
1	Weatherstrip	160SA Head & Jambs		NA
2	Kick Plate	K0050 10" x 1" LDW B4E CSK	630	TR

SECTION 08 8000

GLAZING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
1. Glass for windows, doors, interior borrowed lites, and storefront framing.
2. Glazing sealants and accessories.

1.02 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.04 INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

1.05 QUALITY ASSURANCE

A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.06 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.07 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to

glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AGC Glass Company North America, Inc.
2. Cardinal Glass Industries.
3. Dlubak Corporation.
4. Guardian Industries Corp.
5. Oldcastle BuildingEnvelope.
6. Pilkington North America Inc.
7. PPG Industries, Inc.
8. Saint-Gobain Corporation.
9. Trulite Glass & Aluminum Solutions.
10. Viracon, Inc.

B. Basis of Design Product: Guardian Industries SunGuard Solar glazing.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the California Building Code and ASTM E 1300.

1. Design Wind Pressures: As indicated on Drawings.
2. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

B. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.

3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.03 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.04 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.

C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.05 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
1. Sealing System: Dual seals.
2. Spacer: Manufacturer's standard spacer material and construction.

2.06 GLAZING SEALANTS

A. General:
1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Field-applied sealants shall have a VOC content of not more than 250 g/L.
4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Corning Corporation; 790.
b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
c. May National Associates, Inc.; Bondaflex Sil 290.
d. Pecora Corporation; 890NST.
e. Sika Corporation U.S.; Sikasil WS-290.
f. Tremco Incorporated; Spectrem 1.

2.07 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.08 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.01 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.02 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Apply heel bead of elastomeric sealant.

F. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of

removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.03 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.04 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
   1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

3.05 MONOLITHIC GLASS SCHEDULE

A. Glass Type G01: Clear fully tempered float glass.
   1. Minimum Thickness: 1/4 inch (6 mm).
   2. Safety glazing required.

B. Glass Type G02: Clear fully tempered float glass for transaction window.
   1. Minimum Thickness: 3/8 inch (9.5 mm).
   2. Safety glazing required.

3.06 INSULATING GLASS SCHEDULE

A. Glass Type G03: Tinted insulating glass.
   1. Basis-of-Design Product: Guardian SunGuard Solar.
   2. Overall Unit Thickness: 1 inch (25 mm).
   3. Minimum Thickness of Each Glass Lite: 1/4 inch (6 mm).
   4. Outdoor Lite: Tinted annealed float glass with SNX 62/27 on #2 surface.
   5. Tint Color: Dark green.
   6. Interspace Content: Air.
   7. Indoor Lite: Clear annealed float glass.
   8. Winter Nighttime U-Factor: 0.29 maximum.
   9. Summer Daytime U-Factor: 0.27 maximum.
   10. Visible Light Transmittance: 46 percent minimum.
   11. Solar Heat Gain Coefficient: 0.22 maximum.
   12. Safety glazing required.

B. Glass Type G04: Tinted insulating tempered glass.
   1. Basis-of-Design Product: Guardian SunGuard Solar.
   2. Overall Unit Thickness: 1 inch (25 mm).
   3. Minimum Thickness of Each Glass Lite: 1/4 inch (6 mm).
   4. Outdoor Lite: Tinted fully tempered float glass with SNX 62/27 on #2 surface.
   5. Tint Color: Dark green.
   6. Interspace Content: Air.
   7. Indoor Lite: Clear fully tempered float glass.
   8. Winter Nighttime U-Factor: 0.29 maximum.
   9. Summer Daytime U-Factor: 0.27 maximum.
   10. Visible Light Transmittance: 46 percent minimum.
   11. Solar Heat Gain Coefficient: 0.22 maximum.
   12. Safety glazing required.

END OF SECTION

SECTION 08 9119

FIXED LOUVERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes fixed, extruded-aluminum louvers.

1.02 ACTION SUBMITTALS

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

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

C. Samples: For each type of metal finish required.

D. Delegated-Design Submittal: For louvers indicated to comply with structural and seismic performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.03 INFORMATIONAL SUBMITTALS

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

B. Windborne-debris-impact-resistance test reports.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural and seismic performance requirements and design criteria indicated.

B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
1. Wind Loads: Determine loads based on pressures as indicated on Drawings.

C. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. Design earthquake spectral response acceleration, short period (Sds) for Project is as noted in Drawings.
2. Component Importance Factor is as noted in Drawings.

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

2.02 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Nondrainable-Blade Louver:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Air Balance Inc.; a Mestek company.
b. Air Flow Company, Inc.
c. Airolite Company, LLC (The).
d. All-Lite Architectural Products.
e. American Warming and Ventilating; a Mestek company.
f. Architectural Louvers; Harray, LLC.
g. Arrow United Industries; a division of Mestek, Inc.
h. Carnes Company, Inc.
i. Cesco Products; a division of Mestek, Inc.
j. Construction Specialties, Inc.
k. Dowco Products Group; Safe Air of Illinois.
l. Greenheck Fan Corporation.
m. Louvers & Dampers; a division of Mestek, Inc.
n. Metal Form Manufacturing, Inc.
o. NCA Manufacturing, Inc.
p. Nystrom, Inc.
q. Pottorff.
r. Reliable Products, Inc.
s. Ruskin Company; Tomkins PLC.
t. United Enertech.
u. Vent Products Co., Inc.
2. Louver Depth: 1-1/2 inches.
3. Blade Profile: Plain blade without center baffle.
4. Frame and Blade Nominal Thickness: Not less than 0.060 inch (1.52 mm) for blades and 0.080 inch (2.03 mm) for frames.
5. Mullion Type: Exposed
6. Louver Performance Ratings:
a. Free Area: Not less than 8.0 sq. ft. (0.74 sq. m) for 48-inch- (1220-mm-) wide by 48-inch- (1220-mm-) high louver (50%).
b. Point of Beginning Water Penetration: Not less than 850 fpm (4.3 m/s).
c. Air Performance: Not more than 0.10-inch wg (25-Pa) static pressure drop at 650-fpm (3.3-m/s) free-area exhaust velocity.

2.03 LOUVER SCREENS

A. General: Provide screen at [each exterior louver] [louvers indicated].
1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Bird screening.

B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.

C. Louver Screening for Aluminum Louvers:
1. Bird Screening: Aluminum, 1/2-inch- (13-mm-) square mesh, 0.063-inch (1.60-mm) wire.

2.04 MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T5, T-52, or T6.

B. Fasteners: Use types and sizes to suit unit installation conditions.
1. Use tamper-resistant screws for exposed fasteners unless otherwise indicated.
2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
3. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.
4. For fastening stainless steel, use 300 series stainless-steel fasteners.
5. For color-finished louvers, use fasteners with heads that match color of louvers.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.05 FABRICATION

A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

B. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.06 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
1. Color: As selected by Architect from full range of industry colors and color densities.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

D. Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.02 ADJUSTING

A. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION

SECTION 09 2400

CEMENT PLASTERING (STUCCO)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Exterior Portland cement plasterwork (stucco) on metal lath.
a. **Base Bid** : Three Coat Stucco System, as specified in Section 09 2400 Cement Plastering (Stucco).
b. **Alternate No. 7**: Add/Deduct alternate price to the Base Bid for the cost to install a One Coat Cement Plastering (Stucco) System with integrally colored acrylic top coat, in lieu of the Base Bid three coat stucco system.

1.02 ACTION SUBMITTALS

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

B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

C. Samples: For each type of factory-prepared finish coat indicated.

1.03 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Where indicated, provide Portland cement plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Sound-Transmission Characteristics: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for STC ratings per ASTM E 90 and classified according to ASTM E 413 by a qualified testing agency.

C. Mockups: Before plastering, install mockups of at least 100 sq. ft. (9.3 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.04 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.01 **BASE BID** - THREE COAT CEMENT PLASTERING (STUCCO) SYSTEM.

A. METAL LATH

1. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
   a. 3/8-Inch (9.5-mm) Rib Lath: 3.4 lb/sq. yd. (1.8 kg/sq. m).

B. ACCESSORIES

1. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
2. Basis-of-Design Product: Vinyl Corporation, or approved equal.
3. Plastic Accessories: Fabricated from high-impact PVC.
   a. Cornerbeads: With perforated flanges.
      1) Bull-nose style; use unless otherwise indicated.
   b. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
      1) Bull-nose style; use unless otherwise indicated.
   c. Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
   d. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2-inch- (13-mm-) wide reveal; with perforated concealed flanges.

C. RELATED MATERIALS AND ACCESSORIES

1. General: Stucco assembly materials and related materials shall conform to ASTM C926 and the stucco product manufacturer.
2. Substrate Materials:
   a. Cementitious Backer Board: Specified in Section 09 2900 - Gypsum Board.
   b. Rigid Foam Insulation: Specified in Section 07 2100 - Thermal Insulation.
   c. Water-Resistive Barrier: Specified in Section 07 2500 - Weather Barriers.

D. MISCELLANEOUS MATERIALS

1. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
2. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in Portland cement plaster.
3. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
4. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
5. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21-mm) diameter, unless otherwise indicated.

E. PLASTER MATERIALS

1. Exterior Stucco Materials: Provide Parex Armourwall 300 Krak-Shield stucco system. Comply with the following:
   a. Scratch and Brown Coats: Parex Armourwall 300 Stucco with Parex Fiber-47 Armourwall Fiber-reinforced factory blended portland cement, hydrated lime and proprietary ingredients, cement scratch and brown coat conforming to ASTM C926.

b. Acrylic Additive: Parex 290 Adacryl 100 percent acrylic emulsion additive for portland cement based products, to enhance curing, adhesion, freeze-thaw resistance and workability and as an acrylic polymer bonding agent.

c. Leveling and Reinforcing Coat: Parex Stucco Level Coat Copolymer based, factory blend of cement and proprietary ingredients requiring addition of water. 121 Dry Base Coat: Copolymer based, factory blend of cement and proprietary ingredients requiring addition of water.

d. Reinforcing Mesh: Parex 355 Standard Mesh: Weight 4.5 oz/yd2 reinforcing mesh.

e. Primer: Parex 310 Primer: 100% acrylic based coating to prepare surfaces for Parex finishes.

f. Finish: Parex DPR Optimum Finish Factory blended, 100% acrylic polymer based finish, integrally colored

2. Portland Cement: ASTM C 150, Type I.

a. Color for Finish Coats: White.

3. Plastic Cement: ASTM C 1328.

4. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.

5. Perlite Aggregate: ASTM C 35.

6. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.

a. Color: As selected by Architect from manufacturer's full range.

F. PLASTER MIXES

1. General: Comply with ASTM C 926 for applications indicated.

a. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.

2. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:

a. Portland Cement Mixes:

1) Scratch Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

2) Brown Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

3. Factory-Prepared Finish-Coat Mixes: For acrylic-based finish coatings, comply with manufacturer's written instructions.

2.02 **ALTERNATE # 7**: ONE COAT CEMENT PLASTERING (STUCCO) SYSTEM

A. MANUFACTURERS

1. Manufacturer, Basis of Design: Western 1-Kote - Western Blend, Western Stucco Company, Glendale, Arizona.

B. METAL LATH

1. Metal Plaster Bases: Minimum 17 gauge self-furred stucco netting in accordance with applicable codes and standards.

C. ACCESSORIES

1. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
2. Basis-of-Design Product: Vinyl Corporation, or approved equal.
   a. Plastic Accessories: Fabricated from high-impact PVC.
      1) Cornerbeads: With perforated flanges.
         a) Bull-nose style; use unless otherwise indicated.
      2) Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
         a) Bull-nose style; use unless otherwise indicated.
      3) Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration, with perforated flanges and removable protective tape on plaster face of control joint.
      4) Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2-inch- (13-mm-) wide reveal; with perforated concealed flanges.
      5) Weep Screeds: Foundation weep screed with minimum 3-1/2 inch vertical attachment flange.

D. RELATED MATERIALS AND ACCESSORIES

1. General: Stucco assembly materials and related materials shall conform to ASTM C926 and the stucco product manufacturer.
2. Substrate Materials:
   a. Cementitious Backer Board: Specified in Section 09 2900 - Gypsum Board.
   b. Rigid Foam Insulation: Specified in Section 07 2100 - Thermal Insulation.
   c. Water-Resistive Barrier: Specified in Section 07 2500 - Weather Barriers.

E. MISCELLANEOUS MATERIALS

1. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
2. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in Portland cement plaster.
3. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
4. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
5. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21-mm) diameter, unless otherwise indicated.

F. PLASTER MATERIALS

1. Exterior Stucco Materials: Provide Western 1-Kote - Western Blend stucco system. Comply with the following:
   a. Plaster: Fiber-reinforced factory blended portland cement, hydrated lime and proprietary ingredients, cement scratch coat conforming to ASTM C926.

b. Acrylic Additive: 100 percent acrylic emulsion additive for portland cement based products, to enhance curing, adhesion, freeze-thaw resistance and workability and as an acrylic polymer bonding agent.

2. Portland Cement: ASTM C 150, Type I.
   a. Color for Finish Coats: White.
3. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.
   a. Color: As selected by Architect from manufacturer's full range.

G. PLASTER MIXES

H. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters and acrylic-based finish coatings, comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.02 INSTALLATION, GENERAL

A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

3.03 INSTALLING METAL LATH

A. Expanded-Metal Lath: Install according to ASTM C 1063.
   1. Vertical Furring: Install flat rib lath.
   2. Horizontal Framing: Install 3/8-inch (9.5-mm) rib lath lath.

3.04 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:
   1. Install lath-type, external-corner reinforcement at exterior locations.
   2. Install cornerbead at interior and exterior locations.

C. Control Joints: Install control joints in specific locations approved by Architect for visual effect as follows:
   1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
      a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
      b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
   2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
   3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
   4. Where control joints occur in surface of construction directly behind plaster.

5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.05 PLASTER APPLICATION

A. General: Comply with ASTM C 926.

B. **BASE BID**: Three Coat Cement Plastering (Stucco) system:
1. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; 3/4-inch (19-mm) thickness.
   a. Portland cement mixes.
2. Ceilings; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; 3/4 inch (19 mm) thick.
   a. Portland cement mixes.

C. **ALTERNATE NO. 7**: One Coat Cement Plastering (Stucco) system:
1. Walls; Base-Coat Mix: Scratch coat for one-coat plasterwork, 1/2 inch (13 mm) thick.
   a. Portland cement mixes.
2. Ceilings; Base-Coat Mix: Scratch coat for two-coat plasterwork, 1/2 inch (13 mm) thick on concrete.
   a. Portland cement mixes.

D. Plaster Finish Coats: Apply to provide sacked (California mission) finish to match Architect's sample.

E. Acrylic-Based Finish Coatings: Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

3.06 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION

SECTION 09 2900

GYPSUM BOARD

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Interior gypsum board.
2. Exterior gypsum board for ceilings and soffits.
3. Texture finishes.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:
1. Textured Finishes: Minimum 12 inches by 12 inches for each textured finish indicated and on same backing indicated for Work.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.02 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, provide one of the following:
1. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. PABCO Gypsum.
7. USG Corporation.

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
1. Thickness: 1/2 inch (12.7 mm).
2. Long Edges: Tapered.

D. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 2.
1. Core: 5/8 inch (15.9 mm), Type X.

2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

E. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
1. Core: 5/8 inch (15.9 mm), Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.03 SPECIALTY GYPSUM BOARD

A. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. Georgia-Pacific Gypsum LLC; DensArmour Plus.
2. Core: 5/8 inch (15.9 mm), Type X, abuse resistant.
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.04 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
1. Manufacturers: Subject to compliance with requirements, provide one of the following:
a. American Gypsum.
b. CertainTeed Corp.
c. Georgia-Pacific Gypsum LLC.
d. National Gypsum Company.
e. PABCO Gypsum.
f. USG Corporation.
2. Core: 5/8 inch (15.9 mm), Type X.

B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, provide one of the following:
a. CertainTeed Corp.; GlasRoc Sheathing.
b. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
c. National Gypsum Company; Gold Bond, e(2)XP.
d. USG Corporation; Securock Glass Mat Sheathing.
2. Core: 5/8 inch (15.9 mm), Type X.

2.05 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.

B. Exterior Trim: ASTM C 1047.
1. Material: Hot-dip galvanized steel sheet, plastic, or rolled zinc.

C. Aluminum Trim: ASTM B 221 (ASTM B 221M), Alloy 6063-T5.

2.06 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

2.07 AUXILIARY MATERIALS

A. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing).

D. Acoustical Joint Sealant: ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings as demonstrated by testing according to ASTM E 90.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
b. Grabber Construction Products; Acoustical Sealant GSC.
c. Pecora Corporation; AC-20 FTR.
d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
e. USG Corporation; SHEETROCK Acoustical Sealant.
2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Thermal Insulation: As specified in Section 07 2100 "Thermal Insulation."

2.08 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.
1. Products: Subject to compliance with requirements, provide one of the following:
a. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
b. National Gypsum Company; Perfect Spray EM Texture.
c. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.
2. Texture: Smooth (Sand).

PART 3 - EXECUTION

3.01 APPLYING AND FINISHING PANELS

A. Comply with ASTM C 840.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. Install trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
   1. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

E. Prefill open joints, rounded or beveled edges, and damaged surface areas.

F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   1. Level 0: No taping, finishing, or accessories required.
      a. This level of finish used in temporary construction.
   2. Level 1: Joints and interior angles have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
      a. This level of finish used in plenum area above ceilings, attics, areas where assembly is generally concealed; building corridors and other areas not normally open to public view.
      b. Accessories optional in corridors and other areas with pedestrian traffic.
      c. Where fire-resistance rating is required for the assembly, details of construction shall be in accordance with reports of fire tests of assemblies having met fire-rating requirements.
      d. Tape and fastener heads need not be covered with joint compound.
   3. Level 2: Joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over joints and interior angles. Fastener heads and accessories shall be covered with coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over body of the tape at the time of tape embedment shall be considered separate coat of joint compound and shall satisfy the conditions of this level.
      a. This level of finish used where gypsum board is used as substrate for tile; warehouse storage or other similar areas where surface appearance is not primary concern.
   4. Level 3: Joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with joint knife leaving thin coating of joint compound over joints and interior angles. One additional coat of joint compound shall be applied over joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. Joint compound shall be smooth and free of tool marks and ridges.

a. It is recommended that prepared surface be coated with drywall primer prior to application of final finishes.

1) This level of finish used in areas to receive heavy- or medium-texture (spray or hand applied) finished before final painting, or where heavy-grade wallcoverings are to be applied. This level of finish is not recommended where smooth painted surfaces or light to medium wallcoverings are specified.

5. Level 4: Joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with joint knife leaving thin coating of joint compound over joints and interior angles. One additional coat of joint compound shall be applied over joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. Joint compound shall be smooth and free of tool marks and ridges.

a. It is recommended that prepared surface be coated with drywall primer prior to application of final finishes.

1) This level of finish used where flat paints, light textures, or wallcoverings are specified.

H. Texture Finish Application: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

I. Protect adjacent surfaces from drywall compound and texture finishes and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

J. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION

SECTION 09 3013

CERAMIC TILING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Ceramic mosaic tile.
2. Porcelain tile.
3. Tile backing panels.
4. Crack isolation membrane.
5. Metal edge strips.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:
1. Each type and composition of tile and for each color and finish required. For ceramic tile in color blend patterns, provide samples of each color blend.
2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required.

1.03 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.04 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.05 QUALITY ASSURANCE

A. Installer Qualifications:
1. Installer is a five-star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup of each type of floor tile installation.
2. Build mockup of each type of wall tile installation.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.01 PRODUCTS, GENERAL

A. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.02 TILE PRODUCTS

A. Porcelain Tile Type CT-1: Factory-mounted glazed.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. American Marazzi Tile, Inc.
   b. American Olean Corporation.
   c. Crossville, Inc.
   d. Dal-Tile Corporation.
   e. Florim USA.
   f. Interceramic.
   g. Porcelanite.
   h. Seneca Tiles, Inc.
2. Composition: Impervious porcelain.
3. Module Size: 12 by 24 inch (30 by 60 mm).
4. Thickness: 13/32" (10mm).
5. Face: Pattern of design indicated, rectified.
6. Surface: Slip resistant.
7. Dynamic Coefficient of Friction: Not less than 0.42.
8. Finish: Natural.
9. Tile Color and Pattern: Basaltine - Dark Grey.
10. Grout Color: As indicated on drawings.

B. Porcelain Tile Type CT-2: Factory-mounted glazed.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. American Marazzi Tile, Inc.
   b. American Olean Corporation.
   c. Cactus Stone and Tile.
   d. Crossville, Inc.
   e. Florim USA.
   f. Dal-Tile Corporation.
   g. Interceramic.
   h. Porcelanite.
   i. Seneca Tiles, Inc.
2. Composition: Impervious porcelain.
3. Module Size: 6.5 by 40 inch.
4. Thickness: 3/8 inch.
5. Face: Pattern of design indicated, with cushion edges.
6. Surface: Slip resistant.
7. Dynamic Coefficient of Friction: Not less than 0.42.
8. Finish: Natural.
9. Tile Color and Pattern: Logwood - Grey.
10. Grout Color: As indicated on drawings.

C. Porcelain Tile Type CT-3: Factory-mounted glazed.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Marazzi Tile, Inc.
      b. American Olean Corporation.
      c. Cactus Stone and Tile.
      d. Crossville, Inc.
      e. Florim USA.
      f. Dal-Tile Corporation.
      g. Interceramic.
      h. Porcelanite.
      i. Seneca Tiles, Inc.
   2. Composition: Impervious porcelain.
   3. Module Size: 6.5 by 40 inch.
   4. Thickness: 3/8 inch.
   5. Face: Pattern of design indicated, with cushion edges.
   6. Surface: Slip resistant.
   7. Dynamic Coefficient of Friction: Not less than 0.42.
   8. Finish: Natural.
   9. Tile Color and Pattern: Logwood - Brown.
   10. Grout Color: As indicated on drawings.

D. Porcelain Tile Type CT-4: Factory-mounted glazed.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Marazzi Tile, Inc.
      b. American Olean Corporation.
      c. Crossville, Inc.
      d. Dal-Tile Corporation.
      e. Florim USA.
      f. Interceramic.
      g. Porcelanite.
      h. Seneca Tiles, Inc.
   2. Composition: Impervious porcelain.
   3. Module Size: 2 by 2 inch mosaic (5 by 5 mm).
   4. Thickness: 13/32” (10mm).
   5. Face: Pattern of design indicated, rectified.
   6. Surface: Slip resistant.
   7. Dynamic Coefficient of Friction: Not less than 0.42.
   8. Finish: Natural.
   9. Tile Color and Pattern: Basaltine - Dark Grey.
   10. Grout Color: As indicated on drawings.

E. Ceramic Tile Type CB-1: Factory-mounted glazed.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Marazzi Tile, Inc.
      b. American Olean Corporation.
      c. Cactus Stone and Tile.
      d. Crossville, Inc.
      e. Florim USA.
      f. Dal-Tile Corporation.
      g. Interceramic.
      h. Porcelanite.

i. Seneca Tiles, Inc.
2. Composition: Impervious porcelain.
3. Module Size: 6.5 by 40 inch.
4. Thickness: 3/8 inch.
5. Face: Pattern of design indicated, with cushion edges.
6. Surface: Slip resistant.
7. Dynamic Coefficient of Friction: Not less than 0.42.
8. Finish: Natural.
9. Tile Color and Pattern: Logwood - Grey.
10. Grout Color: As indicated on drawings.

2.03 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, Type A.
1. Products: Subject to compliance with requirements, provide one of the following:
a. C-Cure; C-Cure Board 990.
b. Custom Building Products; Wonderboard.
c. USG Corporation; DUROCK Cement Board.
2. Thickness: 5/8 inch (15.9 mm).

2.04 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch (0.76-mm) nominal thickness.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. Noble Company (The); Nobleseal CIS.

C. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, modified-bituminous sheet with fabric reinforcement facing; 0.040-inch (1mm) nominal thickness.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Boiardi Products Corporation, a QEP company; Elastiment 340 Sound Control Sheet Membrane Waterproofing and Anti-Fracture/Crack Suppression System.
b. Custom Building Products; Crack Buster Pro Crack Prevention Mat Underlayment.
c. National Applied Construction Products, Inc.; ECB Anti-Fracture Membrane.
d. MAPEI Corporation; Mapeguard 2.

2.05 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

B. Dry-Set Portland Cement Mortar (Thinset): ANSI A118.1.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Boiardi Products Corporation; a QEP company.
b. Bonsal American; an Oldcastle company.
c. Bostik, Inc.

d. C-Cure.
e. Custom Building Products.
f. Laticrete International, Inc.
g. MAPEI Corporation.
h. Southern Grouts & Mortars, Inc.
i. Summitville Tiles, Inc.

2. For wall applications, provide nonsagging mortar.

2.06 GROUT MATERIALS

A. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.

B. Standard Cement Grout: ANSI A118.6.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Boiardi Products Corporation; a QEP company.
b. Bonsal American; an Oldcastle company.
c. Bostik, Inc.
d. C-Cure.
e. Custom Building Products.
f. Laticrete International, Inc.
g. MAPEI Corporation.
h. Southern Grouts & Mortars, Inc.
i. Summitville Tiles, Inc.

2.07 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Blanke Corporation.
b. Ceramic Tool Company, Inc.
c. Schluter Systems L.P.

C. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with adhesives, bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50), unless indicated otherwise toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.03 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
   1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
      a. Tile floors in wet areas.
      b. Tile floors consisting of tiles 8 by 8 inches (200 by 200 mm) or larger.
      c. Tile floors consisting of rib-backed tiles.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Ceramic Tile: 1/8 inch (3.2 mm).
2. Porcelain Wall Tile: 1/8 inch (3.2 mm).
3. Porcelain Floor Tile: 1/8 inch (3.2 mm).

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

J. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

K. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

L. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

M. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

N. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

3.04 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:
1. Porcelain Floor Tile Installation: TCNA F113; thinset mortar.
2. Porcelain Tile Type: CT-1.
3. Thinset Mortar: Dry-set portland cement mortar.
4. Grout: Standard unsanded cement grout.

B. Interior Wall Installations, Wood or Metal Studs or Furring:
1. Porcelain Wall Tile Installation: TCNA W221; cement mortar bed (thinset) over waterproof membrane on solid backing.
2. Porcelain Tile Type: CT-2, CT-3, CB-1.
3. Thinset Mortar: Dry-set portland cement mortar.
4. Grout: Standard unsanded cement grout.

C. Shower Receptor and Wall Installations:
1. Porcelain Shower Floor Tile Installation: TCNA F113 over vapor-retarder membrane.
2. Porcelain Floor Tile Type: CT-4.
3. Porcelain Wall Tile Type: CT-2, CT-3
4. Bond Coat for Wet-Set Method: Dry-set portland cement mortar.
5. Grout: Standard unsanded cement grout.

6. Ceramic Wall Tile Installation: TCNA B415; Thin-set mortar over cementitious backer units or fiber-cement backer board over vapor-retarder.
7. Thinset Mortar: Dry-set portland cement mortar.
8. Grout: Standard unsanded cement grout.

END OF SECTION

SECTION 09 5113

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for ceilings.

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. Samples: For each exposed product and for each color and texture specified.

1.04 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Evaluation reports.

C. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to NVLAP.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 450 or less.

2.02 ACOUSTICAL PANEL CEILINGS, GENERAL

A. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

C. Acoustical Panel Standard: Comply with ASTM E 1264.

D. Metal Suspension System Standard: Comply with ASTM C 635.

E. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

2.03 ACOUSTICAL PANELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. Chicago Metallic Corporation.
4. Tectum Inc.
5. USG Interiors, Inc.; Subsidiary of USG Corporation.

2.04 ACOUSTICAL PANEL (**ACT-1**)

A. Classification: Type III, Form 2, Pattern C E

B. Color: White.

C. LR: 0.83

D. NRC: 0.50, Type E-400 mounting according to ASTM E 795.

E. CAC: 35

F. AC: 170

G. Edge/Joint Detail: Beveled, kerfed and rabbeted, or tongue and grooved, or butt.

H. Thickness: Minimum 3/4 inch.

I. Modular Size: 24 inches by 48 inches (609 mm by 1219 mm).

2.05 WASHABLE ACOUSTICAL PANEL (**ACT-2**)

A. Classification: Type XX, Form 2, Unperforated

B. Color: White.

C. LR: 0.88

D. NRC: 0.50, Type E-400 mounting according to ASTM E 795.

E. CAC: 40

F. AC: 170

G. Edge/Joint Detail: Beveled, kerfed and rabbeted, or tongue and grooved, or butt.

H. Thickness: Minimum ¾ inch.

I. Modular Size: 24 inches by 48 inches (609 mm by 1219 mm).

2.06 METAL SUSPENSION SYSTEM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong World Industries, Inc.
2. CertainTeed Corp.
3. Chicago Metallic Corporation.
4. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 9/16-inch-wide metal caps on flanges.
1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Steel cold-rolled sheet.
5. Cap Finish: Painted white unless indicated otherwise.

C. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Work shall be coordinated with all trades prior to installation.

B. Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

C. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.

D. All trades shall remove any construction debris from top side of ceiling tiles after installation.

END OF SECTION

SECTION 09 6513

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Resilient base.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches (300 mm) long.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. FloorScore Compliance: Resilient base shall comply with requirements of FloorScore certification.

B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.02 THERMOSET-RUBBER BASE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
2. Flexco.
3. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
1. Style and Location:
a. Style A, Straight: Provide in areas with carpet.
b. Style B, Cove: Provide in areas with resilient flooring.

C. Thickness: 0.125 inch (3.2 mm).

D. Height: 4 inches (102 mm).

E. Lengths: Cut lengths 48 inches (1219 mm) long or coils in manufacturer's standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Colors: As scheduled or as selected by Architect from full range of industry colors.

2.03 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
1. Adhesives shall have a VOC content of 50 g/L or less.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until they are the same temperature as the space where they are to be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.02 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:
1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
a. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
a. Miter or cope corners to minimize open joints.

3.03 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09 6519

RESILIENT TILE FLOORING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Vinyl composition plank floor tile.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: Full-size units of each color and pattern of plank floor tile required.

1.03 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient plank tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. FloorScore Compliance: Resilient plank tile flooring shall comply with requirements of FloorScore certification.

C. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.02 LUXURY VINYL TILE (LVT-1)

A. Products: Subject to compliance with requirements, provide one of the following:
1. Amtico International Inc;
2. Armstrong World Industries, Inc;
3. Burke Mercer Flooring Products, Division of Burke Industries Inc; .
4. Flexco, Inc;
5. Johnsonite; A Tarkett Company;
6. Roppe Corporation, USA;
7. Shaw Hard Surface

B. Tile Standard: ASTM F 1700.
1. Class: Class III, printed film vinyl tile.
2. Type: Type B, embossed surface.

C. Thickness: .098" (2.5 mm) minimum.

D. Size: 6 by 48 inches (nominal).

E. Colors and Patterns: As indicated in drawings.

2.03 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit plank floor tile and substrate conditions indicated.
   1. Adhesives shall comply with the following limits for VOC content:
      a. Vinyl Composition Tile Adhesives: 50 g/L or less.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prepare substrates according to plank floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
   4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
      a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
      b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install plank floor tiles until they are the same temperature as the space where they are to be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient plank floor tile.

3.02 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing plank floor tile.

B. Lay out plank floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
   1. Lay tiles in pattern indicated.

C. Match plank floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

D. Scribe, cut, and fit plank floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend plank floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on plank floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install plank floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere plank floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.03 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting plank floor tile.

B. Cover plank floor tile until Substantial Completion.

END OF SECTION

SECTION 09 6813

TILE CARPETING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes modular, fusion-bonded carpet tile.

1.02 PERFORMANCE REQUIREMENTS

A. Carpet Tile: All carpet shall be certified to meet the NSF/ANSI 140-(latest edition) Standard at its Gold level.

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

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

B. Shop Drawings: Show the following:
1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
2. Type of installation.
3. Pattern of installation.
4. Pattern type, location, and direction.
5. Pile direction.

1.05 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.06 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.09 ADDITIONAL MATERIALS

A. Provide an additional 100 SF of each carpet tile product used in the project for attic stock.

1.10 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
   3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 CARPET TILE (CPT-1)

A. Basis-of-Design Product: Shaw Contract Group – Natural Palette - Technique.

B. Color and Pattern: As indicated on drawings.

C. Size: 24 by 24 inches (610 by 610 mm).

D. Fiber Content: 100 percent nylon.

E. Fiber Type: Eco Solution Q Nylon.

F. Pile Characteristic: Cut-and-loop pile.

G. Pile Thickness: .162 inches for finished carpet tile.

H. Stitches: 11 per inch.

I. Gage: 1/12.

J. Surface Pile Weight: 34.00 oz./sq. yd.

K. Primary Backing/Backcoating: Manufacturer's standard composite materials.

L. Secondary Backing: Ecoworx tile.

M. Applied Treatments:

   1. Soil-Resistance Treatment: SSP Shaw Soil Protection.

2.02 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
   1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

PART 3 - EXECUTION

3.01 INSTALLATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Preparation: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.

D. Installation: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

E. Installation Method: As recommended in writing by carpet tile manufacturer.

F. Maintain dye lot integrity. Do not mix dye lots in same area.

G. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

H. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

I. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

J. Install pattern parallel to walls and borders.

K. Perform the following operations immediately after installing carpet tile:
   1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
   2. Remove yarns that protrude from carpet tile surface.
   3. Vacuum carpet tile using commercial machine with face-beater element.

L. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

END OF SECTION

SECTION 09 9113

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. Concrete masonry units (CMU).
   3. Steel.
   4. Galvanized metal.
   5. Aluminum (not anodized or otherwise coated).
   6. Wood.
   7. Exterior Portland cement plaster (stucco).
   8. Exterior gypsum board.

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 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 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.

1.07 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 snow, 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.

E. Wood-Knot Sealer:
1. As distributed by Dunn-Edwards: Zinsser BIN.
2. Sherwin-Williams: N/A.
3. Description: Pigmented shellac.

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 WOOD PRIMERS

A. Primer, Latex for Exterior Wood: MPI #6.
1. Dunn-Edwards: EZ-Prime Premium EZPR00.
2. Sherwin-Williams: Exterior Latex Wood Primer, B42W8041

2.06 EPOXY PRIMERS

A. Description: For priming concrete or steel surfaces to receive high performance polyurethane topcoats.

2.07 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.

2.08 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.

2.09 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.

2.10 FLOOR COATINGS

A. Sealer, Water Based, for Concrete Floors:
   1. MPI #99.

B. Sealer, Solvent Based, for Concrete Floors:
   1. MPI #104.

C. Floor Paint, Latex, Low Gloss (Maximum Gloss Level 3):
   1. MPI #60.

D. Floor Enamel, Alkyd, Gloss (Gloss Level 6):
   1. MPI #27.

2.11 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.
   2. Masonry (Clay and CMU): 12 percent.
   3. Wood: 15 percent.
   4. Portland Cement Plaster: 12 percent.
   5. Gypsum Board: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured, including pH testing to determine that alkalinity is within limits established by the manufacturer.

D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. 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.

H. Aluminum Substrates: Remove loose surface oxidation.

I. Wood Substrates:
1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

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. Equipment, including panelboards and switch gear.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Tanks that do not have factory-applied final finishes.

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.

D. Aluminum Substrates:
1. Latex System:
   a. Prime Coat: 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: 100% acrylic universal primer, galvanized, water based, MPI #134.
   b. Intermediate Coat: Premium architectural coating, exterior, water based, matching topcoat.
   c. Topcoat: 100% acrylic exterior flat coating, water based, (Gloss Level 1), MPI #10.
   d. Topcoat: Premium architectural coating, exterior, water based, low sheen, 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.
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.

E. Wood Substrates: Including wood trim, architectural woodwork, doors, windows, wood siding, wood fences, wood-based panel products, glued-laminated construction, exposed joists, exposed beams, wood shingles and shakes (excluding roofs).
1. Latex System:

a. Prime Coat: 100% acrylic for exterior wood, MPI #6.
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, (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: 100% acrylic for exterior wood, MPI#6.
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.

F. Portland Cement Plaster Substrates:
1. Latex over Alkali-Resistant Primer System:
a. Prime Coat: Alkali resistant primer/sealer, 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: Alkali resistant primer/sealer, 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.

G. Exterior Gypsum Board Substrates:
1. Latex System:
a. Prime Coat: Alkali resistant primer/sealer, MPI #3.
b. Prime Coat: Primer, bonding, water based, MPI #17.
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: Alkali resistant primer/sealer, MPI #3.
   b. Prime Coat: Primer, bonding, water based, MPI #17.
   c. Intermediate Coat: Latex, exterior, 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.

END OF SECTION

SECTION 09 9123

INTERIOR PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.
   1. Concrete.
   2. Concrete masonry units (CMU).
   3. Steel.
   4. Cast iron.
   5. Galvanized metal.
   6. Aluminum (not anodized or otherwise coated).
   7. Wood.
   8. Gypsum board.

1.02 DEFINITIONS

A. Gloss Level 1 (Matte, Flat): Not more than 5 units at 60 degrees and 1 to 2 units at 85 degrees.

B. Gloss Level 2 (Velvet, Flat): 5 to 9 units at 60 degrees and 10 to 15 units at 85 degrees.

C. Gloss Level 3 (Eggshell): 10 to 15 units at 60 degrees and 15 to 30 units at 85 degrees.

D. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and 35 to 50 units at 85 degrees.

E. Gloss Level 5 (Semi-Gloss): 40 to 50 units at 60 degrees.

F. Gloss Level 6 (Gloss): 70 to 80 units at 60 degrees.

G. Gloss Level 7 (High Gloss): More than 80 units at 60 degrees.

H. Blocking: Two painted surfaces sticking together such as a painted door sticking to a painted jamb.

I. Bio-Pruf: Biostabilizing additive, to protect products from premature microbial degradation.

J. CHPS: Collaborative for High Performance Schools. A national movement to improve student performance and the entire educational experience by building the best possible schools. www.chps.net.

K. EG: Ethylene Glycol. Ethylene glycol is listed as a hazardous air pollutant (HAP) by the U.S. EPA.

L. EPR: Environmental Performance Rating. Master Painters Institute (MPI) formula that relates to VOC, Performance of Category, Gloss and Appropriate specified use. Higher values equate to greater eco-efficiency.

M. MPI: Master Painters Institute. Organization that establishes architectural paint standards and quality assurance programs in North America. www.paintinfo.com.

N. PDCA: Painting & Decorating Contractors of America. www.pdca.org.

O. RAVOC: Reactivity adjusted VOC. "Reactivity" means the ability of a VOC to promote ozone formation

P. SSPC: The Society for Protective Coatings publishes Scopes of SSPC Surface Preparation Standards and Specifications. www.sspc.org.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
1. Submit Samples on rigid backing, no smaller than 7 inches X 10 inches or larger than 8.5 inches X 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.

D. 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 in Part 2, 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 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 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.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.07 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 105 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F 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. 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: Products shall comply with VOC limits of SCAQMD and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants

added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Primers, Sealers, and Undercoaters: 100 g/L.
4. Rust Preventative Coatings: 100 g/L.
5. Floor Coatings: 100 g/L.
6. Shellacs, Clear: 730 g/L.
7. Shellacs, Pigmented: 550 g/L.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction[and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

D. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Colorants: The use of colorants containing hazardous chemicals, such as ethylene glycol, is prohibited.

F. Colors: As scheduled.

2.03 BLOCK FILLERS

A. Block Filler, Latex, Interior/Exterior:
1. Dunn-Edwards, Smooth Blocfil Select SBSL00 Smooth Block Filler, MPI #4.
2. Sherwin-Williams Interior/Exterior Block Filler, B25W25

2.04 PRIMERS/SEALERS

A. Primer Sealer, Latex, Interior:
1. Dunn-Edwards, Vinylastic Select VNSL00, MPI #50.
2. Sherwin-Williams ProMar 200 Zero VOC Primer, B28W02600

B. Primer, Alkali Resistant, Water Based:
1. Dunn-Edwards, Eff-Stop Select ESSL00, MPI #3.
2. Sherwin-Williams Loxon Concrete and Masonry Primer, A24W8300

C. Primer Sealer, Interior, Institutional Low Odor/VOC:
1. Dunn-Edwards, Ecoshield Primer W600, MPI #149.
2. Sherwin-Williams ProMar 200 Zero VOC Primer, B28W02600

D. Primer Sealer, Interior, Institutional Low Odor/VOC:
1. Dunn-Edwards, ENSO Primer ENSO00, MPI #149 X Green.
2. Sherwin-Williams ProMar 200 Zero VOC Primer, B28w02600

E. Primer, Latex, for Interior Wood:
1. Dunn-Edwards, Inter-Kote acrylic enamel undercoat W6325, MPI #39.
2. Sherwin-Williams Multi-Purpose 0 VOC Primer/Sealer, B51W00450

F. Primer Sealer, Alkyd, Interior:
1. Zinsser Cover Stain, MPI #45 as distributed by Dunn-Edwards Corp.
2. Sherwin-Williams Pro Block Interior Oil-Based Primer, B79W08810

G. Primer, Bonding, Water Based:
1. Dunn-Edwards, Ultra-Grip Premium UGPR00-1, MPI #17.
2. Sherwin-Williams Adhesion Primer, B51W8050

H. Primer, Bonding, Solvent Based:
1. Zinsser Cover Stain, MPI #69 as distributed by Dunn-Edwards Corp.
2. n/a

I. Wood-Knot Sealer:
1. Zinsser BIN as distributed by Dunn-Edwards Corp.
2. N/A

2.05 METAL PRIMERS

A. Primer, Rust-Inhibitive, Water Based:
1. Dunn-Edwards, Bloc-Rust Premium BRPR00-1 Series, MPI #107.
2. Sherwin-Williams Pro Industrial ProCryl Universal Primer, B66W310

B. Primer, Alkyd, Anti-Corrosive, for Metal:
1. Dunn-Edwards, Bloc-Rust Premium BRPR00-1 Series, MPI #79.
2. Sherwin-Williams Kem Kromik Universal Metal Primer, B50WZ1

C. Primer, Epoxy-Ester, Anti-Corrosive, for Metal:
1. Dunn-Edwards, Galv-Alum Premium GAPR00.

D. Primer, Quick-dry for Aluminum:
1. Dunn-Edwards, Galv-Alum Premium GAPR00, MPI #95.
2. Sherwin-Williams Kem Kromik Universal Metal Primer, B50WZ1

E. Primer, Galvanized and Non-Ferrous, Water Based:
1. Dunn-Edwards, Ultra-Grip Premium UGPR00-1, MPI #134.
2. Sherwin-Williams DTM Acrylic Primer/Finish, B66W1

2.06 WATER-BASED PAINTS

A. Latex, Interior, Flat, (Gloss Level 1):
1. Dunn-Edwards, Spartawall SWLL10.MPI #53.
2. Sherwin-Williams ProMar 400 Zero VOC Flat, B30W04651- THIS IS NOT LISTED under MPI#53

B. Latex, Interior, Velvet, (Gloss Level 2):
1. Dunn-Edwards, Spartawall SWLL20. MPI #44.
2. Sherwin-Williams ProMar 400 Zero VOC EgShel, B20W04651

C. Latex, Interior, Eggshell, (Gloss Level 3):
   1. Dunn-Edwards, Spartawall SWLL30. MPI #52.
   2. Sherwin-Williams ProMar 400 Zero VOC EgShel, B20W04651

D. Latex, Interior, Low Sheen, (Gloss Level 4):
   1. Dunn-Edwards, Spartawall SWLL40. MPI #43.
   2. Sherwin-Williams ProMar 400 Zero VOC Semi-Gloss, B31W04651

E. Latex, Interior, Semi-Gloss, (Gloss Level 5):
   1. Dunn-Edwards, Spartawall SWLL50. MPI #54.
   2. Sherwin-Williams ProMar 400 Interior Latex Gloss, B21W00451

F. Latex, Interior, Gloss, (Gloss Level 6):
   1. Dunn-Edwards, Spartashield SSHL60. MPI #114.
   2. Sherwin-Williams SOLO Interior/Exterior Gloss, A77W00051, NOT LISTED in MPI #114

G. Latex, Interior, Institutional Low Odor/VOC, Flat, (Gloss Level 1):
   1. Dunn-Edwards, Ecoshield W601. MPI #143
   2. Sherwin-Williams ProMar 200 Zero VOC Flat, B30W02651

H. Latex, Interior, Low Odor/VOC, Low Sheen, (Gloss Level 3):
   1. Dunn-Edwards, Ecoshield W602.
   2. Sherwin-Williams ProMar 200 Zero VOC Low Sheen, B24W02651

I. Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss, (Gloss Level 5):
   1. Dunn-Edwards, Ecoshield W603. MPI #147
   2. Sherwin-Williams ProMar 200 Zero VOC Semi-Gloss, B31W02651, NOT LISTED in MPI #147

J. Latex, Interior, Institutional Low Odor/VOC, Flat, (Gloss Level 1):
   1. Dunn-Edwards, ENSO ENSO10. MPI #143 X-Green.
   2. Sherwin-Williams ProMar 200 Zero VOC Flat, B30W02651

K. Latex, Interior, Institutional Low Odor/VOC, Eggshell, (Gloss Level 3):
   1. Dunn-Edwards, ENSO ENSO30. MPI #145 X-Green.
   2. Sherwin-Williams ProMar 200 Zero VOC EgShel, B20W02651

L. Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss, (Gloss Level 5):
   1. Dunn-Edwards, ENSO ENSO50. MPI #147 X-Green.
   2. Sherwin-Williams ProMar 200 Zero VOC Semi-Gloss, B31W02651

M. 100% Acrylic, Low Sheen:
   1. Dunn-Edwards, Spartashield SSHL30. MPI #161.
   2. Sherwin-Williams SOLO Interior/Exterior EgShel, A75W00051

N. Acrylic, Semi-Gloss, (Gloss Level 5):
   1. Dunn-Edwards, Spartawall SWLL50. MPI #153.
   2. Sherwin-Williams- ProMar 400 Zero VOC Semi-Gloss, B31W04651

O. 100% Acrylic, Gloss, (Gloss Level 6):
   1. Dunn-Edwards, Evershield EVSH60. MPI #154.
   2. Sherwin-Williams SOLO Interior/Exterior Gloss, A71W00051

2.07 SOLVENT-BASED PAINTS

A. Alkyd, Interior, Semi-Gloss;
1. Dunn-Edwards, Aristowall AWLL50.
2. Sherwin-Williams ProClassic Interior Waterbased Acrylic Alkyd Semi-Gloss, B34W00851

B. Alkyd, Interior Gloss:
1. Dunn-Edwards, Aristowall AWLL60.
2. Sherwin-Williams ProMar 200 Interior Waterbased Acrylic Alkyd Gloss, B35W08251

C. Alkyd, Quick Dry, Semi-Gloss, (Gloss Level 5):
1. Dunn-Edwards, Syn-Lustro, Series 9V. MPI #81.
2. Sherwin-Williams Industrial Enamel, B54 Series

D. Alkyd, Quick Dry, Gloss, (Gloss Level 7):
1. Dunn-Edwards, Syn-Lustro, 10V Series. MPI #96
2. Sherwin-Williams Steel Spec Fast Dry Alkyd, B55W00811

E. Two Component Polyurethane Semi-Gloss, (Gloss Level 3-4):
1. Distributed by Dunn-Edwards: Carboline Carbothane 134 Series aliphatic acrylic polyurethane.
2. Sherwin-Williams Hi Solids Polyurethane Semi-Gloss, B65W351/B60V30

F. Two component Polyurethane Gloss,, (Gloss Level 6):
1. Distributed by Dunn-Edwards: Carboline Carbothane 134 Series aliphatic acrylic polyurethane.
2. Sherwin-Williams Hi Solids Polyurethane Gloss, B65W311/B60V30

2.08 DRY FOG/FALL COATINGS

A. Dry Fall, Latex, Flat:
1. Dunn-Edwards, Aquafall W6079. MPI #118.
2. Sherwin-Williams Waterborne Acrylic Dryfall Flat, B42W1

B. Dry Fall, Latex, Low Sheen, (Gloss Level 3)
1. Dunn-Edwards, Aquafall W6078.
2. Sherwin-Williams Waterborne Acrylic Dryfall EgShel, B42W2

2.09 ALUMINUM PAINT

A. Aluminum Paint:
1. Sherwin-Williams, Silver-Brite Aluminum, B59S11.

2.10 FLOOR COATINGS

A. Stain, Interior, for Concrete Floors:
1. MPI #58.

B. Sealer, Water Based, for Concrete Floors:
1. MPI #99.

C. Sealer, Solvent Based, for Concrete Floors:
1. MPI #104.

D. Floor Paint, Latex, Low Gloss (Maximum Gloss Level 3):
   1. MPI #60.

E. Floor Enamel, Alkyd, Gloss (Gloss Level 6):
   1. MPI #27.

2.11 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 coatings 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 Article 2.2. 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.
   2. Masonry (CMU): 12 percent.
   3. Wood: 15 percent.
   4. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. 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 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 if any.

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, including pH testing to determine that alkalinity is within limits established by the manufacturer.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

F. 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 7/NACE No. 4, "Brush-off Blast Cleaning."
   5. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

G. 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.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:
   1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   2. Sand surfaces that will be exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.03 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but 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. Block Fillers: Provide block fill as scheduled to conform to the following PDCA Standard P12-05:
1. Level 3 - Premium Fill: One or multiple coats of high performance block filler manufactured to be applied at a high dry film build. Block filler shall be back-rolled to eliminate voids and reduce the majority of the masonry profile depth.

F. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in equipment rooms:
   a. Equipment, including panelboards and switch gear.
   b. Uninsulated metal piping.
   c. Uninsulated plastic piping.
   d. Pipe hangers and supports.
   e. Metal conduit.
   f. Plastic conduit.
   g. Tanks that do not have factory-applied final finishes.
   h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces:
   a. Equipment, including panelboards.
   b. Uninsulated metal piping.
   c. Uninsulated plastic piping.
   d. Pipe hangers and supports.
   e. Metal conduit.
   f. Plastic conduit.
   g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
   h. Other items as directed by Architect.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

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 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:
   1. Latex System:
      a. Prime Coat: Primer sealer, latex, interior, MPI #50.
      b. Intermediate Coat: Latex, interior, matching topcoat.
      c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
      d. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
      e. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
      f. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
      g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
      h. Topcoat: Latex, interior, gloss (Gloss Level 6), MPI #114.
   2. Institutional Low-Odor/VOC Latex System:
      a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149
      b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
      c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143.
      d. Topcoat: Latex, interior, institutional low odor/VOC, Low sheen, (Gloss Level 3).
      e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147
   3. Premium Institutional Low-Odor/VOC Latex System:
      a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149 X-Green.
      b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
      c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143 X-Green.
      d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3), MPI #145 X-Green.

e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147 X-Green.

4. Premium Architectural Coating System:
   a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
   b. Intermediate Coat: Premium Architectural Coating, interior, water based, matching topcoat.
   c. Topcoat: 100% Acrylic, interior, water-based, eggshell, (Gloss Level 3), MPI #161.
   d. Topcoat: Acrylic, interior, water-based, semi-gloss, (Gloss Level 5), MPI #153.
   e. Topcoat: 100% Acrylic, interior, water-based, gloss, (Gloss Level 6), MPI #514.
5. Alkyd System:
   a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
   b. Intermediate Coat: Alkyd, interior, matching topcoat.
   c. Topcoat: Alkyd, interior, semi-gloss.
   d. Topcoat: Alkyd, interior, gloss.

B. CMU Substrates:
1. Latex System:
   a. Block Filler: Block filler, latex, interior/exterior, Dunn-Edwards, Smooth Blocfil Select SBSL00, MPI #4.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.
2. Institutional Low-Odor/VOC Latex System
   a. Block Filler: Block Filler, latex, interior/exterior, MPI #4.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143.
   d. Topcoat: Latex, interior, institutional low odor/VOC, low sheen, (Gloss Level 3).
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147.
3. Premium Institutional Low-Odor/VOC Latex System:
   a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143 X-Green.
   d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3), MPI #145 X-Green.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147 X-Green.
4. Premium Architectural Coating System:
   a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
   b. Intermediate Coat: Premium Architectural Coating, interior, water based, matching topcoat.
   c. Topcoat: 100% Acrylic, interior, water based, eggshell, (Gloss Level 3), MPI #161.

d. Topcoat: Acrylic, interior, water based, semi-gloss, (Gloss Level 5), MPI #153.
e. Topcoat: 100% Acrylic, interior, water based, gloss, (Gloss Level 6), MPI #154.

5. Alkyd System:
a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
b. Sealer Coat: Primer sealer, latex, interior, MPI #50.
c. Intermediate Coat: Alkyd, interior, matching topcoat.
d. Topcoat: Alkyd, interior, semi-gloss.
e. Topcoat: Alkyd, interior, gloss.

C. Steel Substrates:
1. Latex over Alkyd Primer System:
a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
b. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #95.
c. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79 or primer, alkyd, quick dry, for metal, MPI #95.
d. Intermediate Coat: Latex, interior, matching topcoat.
e. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
f. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
g. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
h. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
i. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
j. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.

2. Water-Based Dry-Fall System:
a. Topcoat: Dry fall, water based, flat, (Gloss Level 1), MPI #118.
b. Topcoat: Dry fall, water based, low sheen, (Gloss Level 3).

3. Institutional Low-Odor/VOC Latex System:
a. Prime Coat: Primer, Rust inhibitive, water based, MPI #107.
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1) MPI #143
d. Topcoat: Latex, interior, institutional low odor/VOC, low sheen, (Gloss Level 3).
e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5) MPI #147.

4. Premium Institutional Low-Odor/VOC Latex System:
a. Prime Coat: Primer, rust-inhibitive, water based, MPI #107.
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143 X-Green.
d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3), MPI #145 X-Green.
e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147 X-Green.

5. Premium Architectural Coating System:
a. Prime Coat: Primer, rust-inhibitive, water based.
b. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #95.
c. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79 or primer, alkyd, quick dry, for metal, MPI #95
d. Intermediate Coat: Premium Architectural Coating, interior, water based, matching topcoat.

e. Topcoat: 100% Acrylic, interior, water based, eggshell, (Gloss Level 3), MPI #161.
f. Topcoat: Acrylic, interior, water based, semi-gloss, (Gloss Level 5), MPI #153.
g. Topcoat: 100% Acrylic, interior, water based, gloss, (Gloss Level 6), MPI #154.

6. Alkyd System:
   a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
   b. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #95.
   c. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79 or primer, alkyd, quick dry, for metal, MPI #95.
   d. Intermediate Coat: Alkyd, interior, matching topcoat.
   e. Topcoat: Alkyd, interior, semi-gloss.
   f. Topcoat: Alkyd, interior, gloss.
7. Quick-Drying Enamel System:
   a. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #95.
   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.
8. Aluminum Paint System:

D. Galvanized-Metal Substrates:
1. Latex over Waterborne Primer System:
   a. Prime Coat: Primer, galvanized, water based, MPI #134.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.
2. Water-Based Dry-Fall System:
   a. Topcoat: Dry fall, water based, flat, (Gloss Level 1), MPI #118.
   b. Topcoat: Dry fall, water based, low sheen, (Gloss Level 3).
3. Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer, galvanized, water based, MPI #134.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, W601 (Gloss Level 1) MPI #143
   d. Topcoat: Latex, interior, institutional low odor/VOC, low sheen, (Gloss Level 3).
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5) MPI #147.
4. Premium Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer, galvanized, water based, MPI #134.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143 X-Green.
   d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3), MPI #145 X-Green.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147 X-Green.
5. Premium Architectural Coating Over Waterborne Primer System:

a. Prime Coat: Primer, galvanized, water based, MPI #134.
b. Intermediate Coat: Premium Architectural Coating, interior, water based, matching topcoat.
c. Topcoat: 100% Acrylic, interior, water based, eggshell, (Gloss Level 3), MPI #161.
d. Topcoat: Acrylic, interior, water based, semi-gloss, (Gloss Level 5), MPI #153.
e. Topcoat: 100% Acrylic, interior, water based, gloss, (Gloss Level 6), MPI #154.

Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. Latex System:
   a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
   b. Prime Coat: Primer, water based, MPI #134.
   c. Intermediate Coat: Latex, interior, matching topcoat.
   d. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   e. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
   f. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
   g. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
   h. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   i. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.
2. Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer, water based, MPI #134.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1) MPI #143
   d. Topcoat: Latex, interior, institutional low odor/VOC, low sheen, (Gloss Level 3).
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5) MPI #147.
3. Premium Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer, water based, MPI #134.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143 X-Green.
   d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3), MPI #145 X-Green.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147 X-Green.
4. Premium Architectural Coating System:
   a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
   b. Prime Coat: Primer, water based, MPI #134.
   c. Intermediate Coat: Premium Architectural coating, interior, water based, matching topcoat.
   d. Topcoat: 100% Acrylic, interior, water based, eggshell, (Gloss Level 3), MPI #161
   e. Topcoat: Acrylic, interior, water based, semi-gloss, (Gloss Level 5), MPI #153.
   f. Topcoat: 100% Acrylic interior, water based, gloss, (Gloss Level 6), MPI #154.
5. Alkyd System:
   a. Prime Coat: Primer, water based, MPI #134.
   b. Prime Coat: Primer, quick dry, for aluminum, MPI #95.

c. Intermediate Coat: Alkyd, interior, matching topcoat.
d. Topcoat: Alkyd, interior, semi-gloss.
e. Topcoat: Alkyd, interior, gloss.

F. Wood Substrates: Including wood trim, architectural woodwork, doors, windows, wood-based panel products, glued-laminated construction, exposed joists, exposed beams.

1. Latex System:
   a. Prime Coat: Primer, latex, for interior wood.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.
2. Latex over Alkyd Primer System:
   a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.
3. Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, W601 (Gloss Level 1), MPI #143
   d. Topcoat: Latex, interior, institutional low odor/VOC, low sheen, (Gloss Level 3).
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147.
4. Premium Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143 X-Green.
   d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3), MPI #145 X-Green.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147 X-Green.
5. Premium Architectural Coating System:
   a. Prime Coat: Primer, latex, for interior wood.
   b. Intermediate Coat: Premium Architectural Coating, interior, water based, matching topcoat.
   c. 100% Acrylic, interior, water based, eggshell, (Gloss Level 3) MPI #161.
   d. Topcoat: Acrylic, interior, water based, semi-gloss, (Gloss Level 5) MPI #153.
   e. Topcoat: 100% Acrylic, interior, water based, gloss, (Gloss Level 6) MPI #154.

6. Alkyd System:
   a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
   b. Intermediate Coat: Alkyd, interior, matching topcoat.
   c. Topcoat: Alkyd, interior, semi-gloss.
   d. Topcoat: Alkyd, interior, gloss.

G. Gypsum Board Substrates:
1. Latex System:
   a. Prime Coat: Primer sealer, latex, interior, MPI #50.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, velvet, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, eggshell, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, low sheen, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6), MPI #114.
2. Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1), MPI #143.
   d. Topcoat: Latex, interior, institutional low odor/VOC, low sheen, (Gloss Level 3), MPI #145.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5), MPI #147.
3. Premium Institutional Low-Odor/VOC Latex System:
   a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149 X-Green.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat, (Gloss Level 1) MPI #143 X-Green.
   d. Topcoat: Latex, interior, institutional low odor/VOC, eggshell, (Gloss Level 3) MPI #145 X-Green.
   e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss, (Gloss Level 5) MPI #147 X-Green.
4. Premium Architectural Coating System:
   a. Prime Coat: Primer sealer, latex, interior, MPI #50.
   b. Intermediate Coat: Premium Architectural Coating, interior, water based, matching topcoat.
   c. Topcoat: 100% Acrylic, interior, water based, eggshell, (Gloss Level 3), MPI #161.
   d. Topcoat: Acrylic, interior, water based, semi-gloss, (Gloss Level 5) MPI #153.
   e. Topcoat: 100% Acrylic, interior, water based, gloss, (Gloss Level 6) MPI #154.
5. Alkyd over Latex Primer System:
   a. Prime Coat: Primer sealer, latex, interior, MPI #50.
   b. Intermediate Coat: Alkyd, interior, matching topcoat.
   c. Topcoat: Alkyd, interior, semi-gloss.
   d. Topcoat: Alkyd, interior, gloss.

H. Maintenance Building Floor (Alternate #2)

1. EP-1: Floor:

a. Prime: Two component epoxy, Sherwin-Williams, Tile-Clad HS Epoxy; MPI #77.

b. Broadcast 30 mesh sand to refusal into wet film of primer (non-skid).

c. Intermediate Coat: Two component epoxy, Sherwin-Williams, Tile-Clad HS Epoxy; MPI #77.

d. TopCoat: Two component epoxy, Sherwin-Williams, Tile-Clad HS Epoxy; MPI #77.

END OF SECTION

SECTION 10 1100

VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Visual display board assemblies.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For visual display units.
1. Include plans, elevations, sections, details, and attachment to other work.
2. Show locations of panel joints.

C. Samples: For each type of visual display unit indicated.

D. Product Schedule: For visual display units.

1.03 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Life of the building.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

2.02 VISUAL DISPLAY BOARD ASSEMBLY

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. A-1 Visual Systems.
2. AARCO Products, Inc.
3. ADP Lemco, Inc.
4. Architectural School Products Ltd.
5. Aristocrat Industries, Inc.
6. Aywon.
7. Bangor Cork Company, Inc.
8. Best-Rite Manufacturing; a brand division of MooreCo, Inc.
9. Claridge Products and Equipment, Inc.
10. Egan Visual Inc.
11. EverWhite; a division of Glenroy, Inc.
12. Ghent Manufacturing, Inc.
13. Marsh Industries, Inc.; Visual Products Group.
14. Newline Products, Inc.
15. Peter Pepper Products, Inc.
16. Platinum Visual Systems; a division of ABC School Equipment, Inc.

B. Visual Display Board Assembly: Factory fabricated.
1. Assembly: Markerboard and tackboard.
2. Corners: Square.
3. Visual Display Board Sizes:
a. Markerboards:
1) Size 1: 48 inches height by 60 inches width.
2) Size 2: 48 inches height by 72 inches width.
b. Tackboard:
1) Size: 48 inches height by 60 inches width.

C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.
1. Color: White.

D. Tackboard Panel: Vinyl-fabric-faced tackboard panel on core indicated.
1. Fabric Wrapped Edge: Wrap edge of tackboard panel with fabric facing.
2. Color and Pattern: As selected by Architect from full range of industry colors.

E. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- (1.57-mm-) thick, extruded aluminum; standard size and shape.
1. Field-Applied Trim: Manufacturer's standard, snap-on trim with no visible screws or exposed joints.
2. Aluminum Finish: Manufacturer's standard baked-enamel or powder-coat finish.
a. Color: As selected by Architect from full range of industry colors and color densities.

F. Joints: Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, as indicated on approved Shop Drawings.

G. Chalktray: Manufacturer's standard; continuous.
1. Box Type: Extruded aluminum with slanted front, grooved tray, and cast-aluminum end closures.
2. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.

H. Display Rail: Manufacturer's standard, extruded-aluminum display rail with plastic-impregnated-cork insert, end stops, and continuous paper holder, designed to hold accessories.
1. Size: 1 inch (25 mm) full length of visual display unit.
2. Tackboard Insert Color: As selected by Architect from full range of industry color.

3. Aluminum Color: Match finish of visual display assembly trim.

2.03 MATERIALS

A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.

B. Vinyl Fabric: Mildew resistant, washable, complying with FS CCC-W-408D, Type II, burlap weave; weighing not less than 13 oz./sq. yd. (440 g/sq. m); with surface-burning characteristics indicated.

C. Medium-Density Fiberboard: ANSI A208.2; made with binder containing no urea formaldehyde.

D. Fiberboard: ASTM C 208 cellulosic fiber insulating board.

E. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063.

2.04 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

B. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

B. Factory-Fabricated Visual Display Board Assemblies: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches (400 mm) o.c. Secure tops and bottoms of boards to walls.

END OF SECTION

SECTION 10 1416

PLAQUES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes plaques.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

Shop Drawings: For plaques.

1. Include fabrication and installation details and attachments to other work.
2. Show plaque mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, and layout for each plaque at least half size.

C. Samples: For each exposed product and for each color and texture specified.

1.03 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

B. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and sufficient production capacity to produce sign units required without causing delay in the Work.

1. Signage shall be ADA compliant. California Grade 2 Braille is to be used at all signs requiring the use of Braille.

2. Signage shall be compliant with current California Building Code.

2.02 MANUFACTURERS

A. Acceptable Manufacturers:
1. A.R.K. Ramos; (800) 725-7266.
2. Corpus Christi Stamp Works, Inc; (800) 332-4515
3. Gemini Incorporated; (800) 538-8377.
4. Or approved equal.

2.03 PLAQUES

Etched Plaque: Chemically etched or photochemically engraved metal sheet or plate with texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Plaque Material: Sheet or plate bronze.
2. Plaque Thickness: 0.250 inch (6.35 mm).
3. Finishes:
   a. Integral Metal Finish: As selected by Architect from full range of industry finishes.
4. Integral Edge Style: Square cut, polished.
5. Letterstyle: Times Roman, or as selected.
6. Letter Height: Three (3) different sizes
7. Logos: Artwork provided by Owner.
8. Mounting: Concealed studs.

2.04 MATERIALS

A. Bronze Plate: Alloy UNS No. C22000 (commercial bronze).

2.05 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
1. For exterior exposure, furnish nonferrous-metal devices unless otherwise indicated.
2. Plaque Mounting Fasteners:
   a. Concealed Studs: Concealed (blind), threaded studs welded screwed into back of plaque.

B. Adhesive: As recommended by plaque manufacturer.

FABRICATION

A. General: Provide manufacturer's standard plaques according to requirements indicated.
1. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
2. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
3. Drill and tap for required fasteners. Use concealed fasteners.

4. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into panel surface indicated to produce precisely formed copy, incised to uniform depth.
   1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
   1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
   2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
   3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.

B. Mounting Methods:
   1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.
      a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.
      b. Thin or Hollow Surfaces: Place plaque in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

C. Remove temporary protective coverings and strippable films as plaques are installed.

END OF SECTION

SECTION 10 1423

PANEL SIGNAGE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Room-identification signs.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For panel signs.
1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
4. Show locations of electrical service connections.
5. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

D. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

1.03 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

B. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and

sufficient production capacity to produce sign units required without causing delay in the Work.

1. Signage shall be ADA compliant. California Grade 2 Braille is to be used at all signs requiring the use of Braille.
2. Signage shall be compliant with current California Building Code.

2.02 SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. APCO Graphics, Inc.
2. ASE, Inc.
3. ASI Sign Systems, Inc.
4. Best Sign Systems Inc.
5. InPro Corporation.
6. Mohawk Sign Systems.
7. Nelson-Harkins Industries.
8. Seton Identification Products.

B. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Basis-of-Design Product: Best Sign Systems, Graphic Blast MP.
2. Laminated-Sheet Sign: Melamine plastic with lettering and tactile characters/symbols raised from sign face plate.
   a. Color(s): As selected by Architect from manufacturer's full range.
3. Sign-Panel Perimeter: Finish edges smooth.
   a. Edge Condition: Square cut.
   b. Corner Condition in Elevation: Square.
4. Mounting: Manufacturer's standard method for substrates indicated.

2.03 ACCESSORIES

A. Adhesives: As recommended by sign manufacturer and with a VOC content of 70 g/L or less for adhesives used inside the weatherproofing system and applied on-site when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Adhesives: As recommended by sign manufacturer and that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.04 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

2. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
4. Internally brace signs for stability and for securing fasteners.
5. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into panel surface indicated to produce precisely formed copy, incised to uniform depth.
1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.
2. Engraved Opaque Acrylic Sheet: Fill engraved graphics with manufacturer's standard enamel.
3. Face-Engraved Clear Acrylic Sheet: Fill engraved copy with manufacturer's standard enamel. Apply manufacturer's standard opaque background color coating to back face of acrylic sheet.
4. Engraved Plastic Laminate: Engrave through exposed face ply of plastic-laminate sheet to expose contrasting core ply.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:
1. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
2. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

C. Remove temporary protective coverings and strippable films as signs are installed.

END OF SECTION

SECTION 10 2113.13

METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes painted steel toilet compartments configured as toilet enclosures and urinal screens.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, and attachment details.

C. Samples for each type of toilet compartment material indicated.

1.03 INFORMATIONAL SUBMITTALS

A. Product certificates.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

2.02 PAINTED STEEL TOILET COMPARTMENTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Accurate Partitions Corporation.
2. All American Metal Corp.
3. American Sanitary Partition Corporation.
4. Ampco, Inc.
5. Bradley Corporation; Mills Partitions.
6. General Partitions Mfg. Corp.
7. Global Steel Products Corp.
8. Hadrian Manufacturing Inc.
9. Metpar Corp.

B. Toilet-Enclosure Style: Overhead braced.

C. Urinal-Screen Style: Wall hung, flat panel.

D. Door, Panel, and Pilaster Construction: Seamless, metal facing sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures; corners secured by welding or clips and exposed welds ground smooth. Provide with no-sightline system. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.
   1. Core Material: Manufacturer's standard sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch (25 mm) for doors and panels and 1-1/4 inches (32 mm) for pilasters.
   2. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units of size and material adequate for panel to withstand applied downward load on grab bar of at least 250 lbf (1112 N), when tested according to ASTM F 446, without deformation of panel.
   3. Tapping Reinforcement: Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.

E. Urinal-Screen Construction:
   1. Flat-Panel Urinal Screen: Matching panel construction.

F. Facing Sheets and Closures: Electrolytically coated steel or hot-dip galvanized-steel sheet with nominal base-metal (uncoated) thicknesses as follows:
   1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.036 inch (0.91 mm).
   2. Pilasters, Unbraced at One End: Manufacturer's standard thickness, but not less than 0.048 inch (1.21 mm).
   3. Panels: Manufacturer's standard thickness, but not less than 0.030 inch.
   4. Doors: Manufacturer's standard thickness, but not less than 0.030 inch (0.76 mm).
   5. Flat-Panel Urinal Screens: Thickness matching the panels.

G. Pilaster Shoes: Stainless-steel sheet, not less than 0.031-inch (0.79-mm) nominal thickness and 3 inches (76 mm) high, finished to match hardware.

H. Brackets (Fittings):
   1. Stirrup Type: Ear or U-brackets; stainless steel.
   2. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

I. Steel Sheet Finish: Manufacturer's standard baked-on finish.
   1. Color: As selected by Architect from manufacturer's full range.
      a. Allow for application of one color in each room.

2.03 HARDWARE AND ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard operating hardware and accessories.
   1. Material: Clear-anodized aluminum.
   2. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.

B. Hardware and Accessories: Manufacturer's heavy-duty stainless-steel operating hardware and accessories.
   1. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.

C. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

D. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.04 FABRICATION

A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories, and solid blocking within panel where required for attachment of toilet accessories.

B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position indicated with manufacturer's recommended anchoring devices.
   1. Maximum Clearances:
      a. Pilasters and Panels: 1/2 inch (13 mm).
      b. Panels and Walls: 1 inch (25 mm).
   2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than two brackets attached near top and bottom of panel.
      a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
      b. Align brackets at pilasters with brackets at walls.

3.02 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION

SECTION 10 2239

FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Electrically operated, acoustical panel partitions.

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 operable panel partitions.
1. Include plans, elevations, sections, details, and attachments to other work.
2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
3. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale and coordinated with each other, using input from installers of the items involved.

B. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.

C. Seismic Qualification Certificates: For operable panel partitions, tracks, accessories, and components, from manufacturer.

D. Product certificates.

E. Product test reports.

F. Sample warranty.

1.05 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.07 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design seismic bracing of tracks to structure above.

B. Seismic Performance: Operable panel partitions shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term "withstand" means "the partition panels will remain in place without separation of any parts from the system when subjected to the seismic forces specified."

C. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
   1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.

D. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency.
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.02 OPERABLE ACOUSTICAL PANELS

A. Operable Acoustical Panels: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Advanced Equipment Corporation.
      b. Hufcor Inc.
      c. Moderco Inc.
      d. Modernfold, Inc. (Basis of Design)
      e. Panelfold Inc.

B. Panel Operation: Electrically operated, continuously hinged panels.

C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.

E. STC: Not less than 47.

F. Panel Materials:
1. Medium-Density Fiberboard: ANSI A208.2, made with binder containing no urea formaldehyde.

G. Panel Closure: Hinged panel closure.

SEALS

A. General: Provide seals that produce operable panel partitions complying with performance requirements and the following:
1. Seals made from materials and in profiles that minimize sound leakage.
2. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.

B. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.
1. Automatically Operated for Acoustical Panels: Extension and retraction of bottom seal automatically operated by movement of partition, with operating range not less than 2 inches (50 mm) between retracted seal and floor finish.

2.04 PANEL FINISH FACINGS

A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
1. Color/Pattern: As selected by Architect from manufacturer's full range.

B. Fabric Wall Covering: Manufacturer's standard fabric, from same dye lot, treated to resist stains.

C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing.

2.05 SUSPENSION SYSTEMS

A. Tracks: 11 gauge steel with adjustable steel hanger rods for overhead support, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch (2.54

mm) between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

B. Carriers: All steel trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.

C. Track Intersections, Switches, and Accessories: As required for operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.

2.06 ELECTRIC OPERATORS

A. General: Factory-assembled electric operation system of size and capacity recommended and provided by operable panel partition manufacturer for partition specified; with electric motor and factory-prewired motor controls, speed reducer, chain drive, control stations, control devices, and accessories required for operation. Include wiring from control stations to motor. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

B. Comply with NFPA 70.

C. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6.

D. Control Stations: Two single-key-operated, constant-pressure control stations located remotely from each other on opposite sides and opposite ends of partition run. Wire in series to require simultaneous activation of both key stations to operate partition. Each three-position control station labeled "Open," "Close," and "Stop." Furnish two keys per station.

E. Obstruction-Detection Devices: Equip each motorized operable panel partition with indicated automatic safety sensor that causes operator to immediately stop and reverse direction.

F. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop operable panel partition at fully extended and fully stacked positions.

G. Emergency Release Mechanism: Quick disconnect-release of electric-motor drive system, permitting manual operation in event of operating failure.

H. Electric Interlock: Equip each motorized operable panel partition with electric interlocks at locations indicated, to prevent operation of operable panel partition under the following conditions:
   1. On storage pocket door, to prevent operation if door is not in fully open position.

2.07 ACCESSORIES

A. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.
   1. Manufacturer's standard method to secure storage pocket door in closed position.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.

B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.

C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

D. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

E. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals.

3.02 ADJUSTING

A. Adjust storage pocket doors to operate smoothly and easily, without binding or warping.

B. Verify that safety devices are properly functioning.

3.03 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION

SECTION 10 2600

WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Corner guards.

1.02 ACTION SUBMITTALS

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

B. Shop Drawings: For each impact-resistant wall protection unit. Include sections, details, and attachments to other work.
1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long.

1.03 INFORMATIONAL SUBMITTALS

A. Material certificates.

B. Material test reports.

C. Warranty: Sample of special warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Surface-Burning Characteristics: As determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another qualified testing agency.

C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

D. Preinstallation Conference: Conduct conference at Project site.

1.06 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall protection units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures.
   b. Deterioration of plastic and other materials beyond normal use.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

A. PVC Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout.
   1. Impact Resistance: Minimum 25.4 ft-lbf/in. (1356 J/m) of notch when tested according to ASTM D 256, Test Method A.
   2. Chemical and Stain Resistance: Tested according to [**ASTM D 543**] [**ASTM D 1308**].
   3. Self-extinguishing when tested according to ASTM D 635.
   4. Flame-Spread Index: 25 or less.
   5. Smoke-Developed Index: 450 or less.

B. Polycarbonate Plastic Sheet: ASTM D 6098, S-PC01, Class 1 or 2, abrasion resistant; with a minimum impact-resistance rating of 15 ft-lbf/in. (800 J/m) of notch when tested according to ASTM D 256, Test Method A.

C. Aluminum Extrusions: Alloy and temper recommended by manufacturer for type of use and finish indicated, but with not less than strength and durability properties specified in ASTM B 221 (ASTM B 221M) for Alloy 6063-T5.

D. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

E. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

CORNER GUARDS

A. Surface-Mounted, Resilient, Plastic Corner Guards: Assembly consisting of snap-on plastic cover installed over continuous retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] <**Insert manufacturer's name; product name or designation**> or comparable product by one of the following:
      a. American Floor Products Co., Inc.
      b. Arden Architectural Specialties, Inc.
      c. Balco, Inc.
      d. Construction Specialties, Inc.
      e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
      f. Korogard Wall Protection Systems; a division of RJF International Corporation.

g. Musson Rubber Company.
h. Pawling Corporation.
i. Tepromark International, Inc.
j. WallGuard.com.

2. Cover: Extruded rigid plastic, minimum [**0.078-inch (2.0-mm)**] [**0.100-inch (2.5-mm)**] wall thickness; in dimensions and profiles indicated on Drawings.
   a. Color and Texture: As selected by Architect from manufacturer's full range.
3. Retainer: Minimum 0.060-inch- (1.5-mm-) thick, one-piece, extruded aluminum.
4. Retainer Clips: Manufacturer's standard impact-absorbing clips.
5. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

EXECUTION

3.01 INSTALLATION

A. General: Install impact-resistant wall protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
   1. Install impact-resistant wall protection units in locations and at mounting heights indicated on Drawings.
   2. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.
      a. Provide anchoring devices to withstand imposed loads.
      b. Where splices occur in horizontal runs of more than 20 feet (6.1 m), splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches (305 mm).
      c. Adjust end and top caps as required to ensure tight seams.

B. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.

C. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10 2800

TOILET ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Washroom accessories.
2. Childcare accessories.
3. Underlavatory guards.
4. Custodial accessories.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:
1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation,
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

1.03 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.05 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.06 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.07 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. American Specialties, Inc.
   2. Bobrick Washroom Equipment, Inc.
   3. Bradley Corporation.
   4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
   5. Products in this section are based on products manufactured by Bobrick Washroom Specialties, Inc. in order to establish a level of quality.

B. Toilet Tissue (Roll) Dispenser TPH:
   1. Basis-of-Design Product: Bobrick B-2840.
   2. Description: Double-roll dispenser with shelf.
   3. Mounting: Surface mounted.
   4. Operation: Noncontrol delivery with theft-resistant spindle.
   5. Capacity: Designed for 5-inch- diameter tissue rolls.
   6. Material and Finish: Stainless steel, No. 4 finish (satin.

C. Paper Towel (Folded) Dispenser PT:
   1. Basis-of-Design Product: Bobrick B-262.
   2. Mounting: Surface mounted.
   3. Minimum Capacity: 400 C-fold towels.
   4. Material and Finish: Stainless steel, No. 4 finish (satin).
   5. Lockset: Tumbler type.

D. Combination Towel (Folded) Dispenser/Waste Receptacle PTD/WR:
   1. Basis-of-Design Product: Bobrick B-3949.
   2. Description: Combination unit for dispensing C-fold or multifold towels, with removable waste receptacle.
   3. Mounting: Surface mounted.
   4. Minimum Towel-Dispenser Capacity: 600 C-fold or 800 multifold paper towels.
   5. Minimum Waste-Receptacle Capacity: 12 gallons.
   6. Material and Finish: Stainless steel, No. 4 finish (satin).
   7. Liner: Reusable, vinyl waste-receptacle liner.
   8. Lockset: Tumbler type for towel-dispenser compartment and waste receptacle.

E. Liquid-Soap Dispenser SD:
   1. Basis-of-Design Product: Bobrick B-2112.
   2. Description: Designed for dispensing soap in liquid or lotion form.
   3. Mounting: Horizontally oriented, surface mounted.
   4. Capacity: 40 oz.
   5. Stainless steel, No. 4 finish (satin).
   6. Refill Indicator: Window type.

F. Grab Bar GB:

1. Basis-of-Design Product: Bobrick B-6806.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Outside Diameter: 1-1/2 inches.
5. Configuration and Length: As indicated on Drawings.

G. Grab Bar GB (Shower Stall):
1. Basis-of-Design Product: Bobrick B-6861.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Outside Diameter: 1-1/2 inches.
5. Configuration and Length: As indicated on Drawings.

H. Sanitary-Napkin Disposal Unit SND:
1. Basis-of-Design Product: Bobrick B-270, Contura Series.
2. Mounting: Surface or partition mounted.
3. Door or Cover: Self-closing, flip-up cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless steel, No. 4 finish (satin).

I. Seat-Cover Dispenser TSCD:
1. Basis-of-Design Product: Bobrick B-221.
2. Mounting: Surface or partition mounted.
3. Minimum Capacity: 500 seat covers.
4. Exposed Material and Finish: Stainless steel, No. 4 finish (satin).
5. Lockset: Tumbler type.

J. Mirror Unit MI-S:
1. Basis-of-Design Product: Bobrick B-165-1824.
2. Frame: Stainless-steel channel.
   a. Corners: Welded and ground smooth.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
   a. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
4. Size: 18 inches by 24 inches unless indicated otherwise.

2.02 CHILDCARE ACCESSORIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. American Specialties, Inc.
2. Brocar Products, Inc.
3. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
4. Koala Kare Products; a division of Bobrick Washroom Equipment, Inc.

B. Diaper-Changing Station BCS:
1. Basis-of-Design Product: Koala KB110-SSWM.
2. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.
   a. Engineered to support a minimum of 250-lb static load when opened.

3. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
4. Operation: By pneumatic shock-absorbing mechanism.
5. Material and Finish: Stainless steel, No. 4 finish (satin), with replaceable insulated polystyrene tray liner and rounded plastic corners.
6. Liner Dispenser: Built in.

2.03 UNDERLAVATORY GUARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Plumberex Specialty Products, Inc.
2. Truebro by IPS Corporation.

B. Underlavatory Guard UG:
1. Description: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
2. Material and Finish: Antimicrobial, molded plastic, white.

2.04 CUSTODIAL ACCESSORIES

A. Mop and Broom Holder MB-1:
1. Basis-of-Design Product: Bobrick B-224.
2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 36 inches.
4. Hooks: Three.
5. Mop/Broom Holders: Four, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, No. 4 finish (satin).
a. Shelf: Not less than nominal 0.05-inch- thick stainless steel.
b. Rod: Approximately 1/4-inch- diameter stainless steel.

B. Wall Shelf WS:
1. Basis-of-Design Product: Bobrick B-295.
2. Description: Unit with shelf.
3. Length: 24 inches.
4. Material and Finish: Stainless steel, No. 4 finish (satin).
a. Shelf: Not less than nominal 0.05-inch- thick stainless steel.

2.05 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.02 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

SECTION 10 4413

FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes 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 depths.

1.05 SEQUENCING

A. Apply decals on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.02 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.

D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
   1. Square-Edge Trim: 1-1/4- to 1-1/2-inch (32- to 38-mm) backbend depth.

E. Cabinet Trim Material: Steel sheet.

F. Door Material: Steel sheet.

G. Door Style: Flush opaque panel, frameless, with no exposed hinges.

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

I. 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.

J. 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.

2.03 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 recesses semirecessed 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 4416

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 10 5113

METAL LOCKERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Welded metal lockers.

1.02 ACTION SUBMITTALS

A. Product data.

B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work, and locker identification system and numbering sequence.

C. Samples: For each color specified.

1.03 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
1. Warranty Period for Welded Metal Lockers: Lifetime from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

2.02 WELDED LOCKERS

A. Basis of Design Product: Documents are based on Sentinel Infinity Wardrobe Lockers by Tiffin Metal Products.

B. Construction:
1. Welded frame consisting of top and sides of minimum 18 gauge steel and back and bottom of 16 gage steel.
2. Steel corner gussets welded to each front corner.

3. Shelves, reinforcements, and other interior components: Minimum 18 gauge steel.
4. Two full-length slotted channels constructed as part of locker back panel allowing for adjustment of interior components, with slots spaced 1-1/2 inches on center. Adjustable components may be locked into place without use of rivets.
5. Provide mounting holes for attachment of sloping tops, end panels, and fillers.
6. Provide mounting holes for attaching adjacent lockers at backs and sides.
7. Provide knockouts for electrical access; one in each top centered towards back of locker and one on back panel centered at top.
8. Provide 4” high, 18 gauge metal locker curb.
9. Provide 18 gauge slope top.

C. Ventilation:
1. Ventilation holes on top of locker.
2. Air vents in bottom of locker frame.
3. Minimum 1 inch gap between sides of shelving components and sides of locker.
4. Minimum 1 inch gap between front of shelving components and front of locker.

D. Doors:
1. Two-piece, 18 gauge steel formed and riveted or fastened with self-clinching studs or mechanical fasteners.
2. Door type: Single.
3. Hinges: Continuous type, minimum 16 gauge stainless steel.
4. Door assembly riveted to door frame.
5. Locking mechanism:
a. Slam shut three point latching.
b. Keyed locks with master key override. Furnish two keys per lock and one master key. Key as directed by Owner.

E. Internal Components:
1. One adjustable small shelf.
2. Lockable compartment of minimum 18 gauge steel sides and minimum 20 gauge top, bottom, and door, with double hook on bottom.
3. Accessories:
a. Finished end panels without exposed fasteners.
b. Locker numbers or user names: As designated by Owner.

2.03 FINISHES

A. Steel: Minimum 3 mil thick factory-applied baked-on textured powder coat finish.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved Shop Drawings.

B. Set plumb, level, and aligned.

C. Attach lockers to supporting construction with anchors best suited to substrate conditions.

D. Bolt adjacent locker units together to provide rigid installation.

E. Install end panels.

END OF SECTION

SECTION 10 7516

GROUND-SET FLAGPOLES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes ground-set flagpoles made from aluminum.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.
2. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer (postindustrial) recycled content. Include statement indicating cost for each product having recycled content.

B. Delegated-Design Submittal: For flagpoles.

1.03 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design flagpole assemblies.

B. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.
1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 120 mph.

2.03 ALUMINUM FLAGPOLES

A. Aluminum Flagpoles: Cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch (4.8 mm).
1. Basis-of-Design Product: American Flagpole. Subject to compliance with requirements, provide products by one of the following:
a. Acme/Lingo Flagpoles LLC.
b. American Flagpole; a Kearney-National Inc. company.

c. Baartol Company.
d. Concord Industries, Inc.
e. Eder Flag Manufacturing Company, Inc.
f. Ewing Flagpoles.
g. Morgan-Francis Flagpoles and Accessories.
h. Pole-Tech Company Inc.
i. U.S. Flag & Flagpole Supply, LP.

B. Exposed Height: 25 feet (7.5 m).

C. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch (1.52-mm) wall thickness with 3/16-inch (4.8-mm) steel bottom plate and support plate; 3/4-inch- (19-mm-) diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

D. Sleeve for Aluminum Flagpole: Fiberglass or PVC pipe foundation sleeve, made to fit flagpole, for casting into concrete foundation.

2.04 FITTINGS

A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.
1. Basis of Design Product: American Flagpole "American Beacon" finial ball with down lighting system.
2. 0.063-inch (1.6-mm) spun aluminum with gold anodic finish.
3. Finial Light: Double, high intensity LED lighting; 12V system

B. External Halyard: Ball-bearing, nonfouling, revolving truck assembly of cast metal with continuous 5/16-inch- (8-mm-) diameter, braided polypropylene halyard and 9-inch (228-mm) cast-metal cleats with fasteners. Finish exposed metal surfaces to match flagpole.
1. Halyards and Cleats: Two at each flagpole.
2. Halyard Flag Snaps: Chromium-plated swivel snap hooks. Furnish two per halyard.

C. Pole-mounted uplight: Provide light-mounting assembly, including integral 120V: 12V, 120W transformer/power supply with photocell control.

2.05 MISCELLANEOUS MATERIALS

A. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

B. Sand: ASTM C 33/C 33M, fine aggregate.

C. Elastomeric Joint Sealant: Multi-component non-sag urethane joint sealant complying with requirements in Section 07 9200 "Joint Sealants."

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.06 ALUMINUM FINISHES

A. Natural Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

D. Sleeves: Locate and secure sleeves in forms by bracing to reinforcement and forms.

E. Place concrete, as specified in Section 03 3000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use non-staining curing compound.

F. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.02 FLAGPOLE INSTALLATION

A. General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION

SECTION 11 1200

PARKING CONTROL EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Vehicle detectors.

1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.03 ACTION SUBMITTALS

A. Product data.

B. Shop Drawings: For parking control equipment.
1. Include plans, elevations, sections, details, and attachments to other work.
2. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.04 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For parking control equipment to include in emergency, operation, and maintenance manuals.

B. Software and Firmware Operational Documentation:
1. Device address list.
2. Printout of software application and graphic screens.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

PART 2 - PRODUCTS

2.01 VEHICLE DETECTORS

A. General: Provide detection devices that sense presence or transit of vehicles and emit signals activating gate operators.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Amano McGann.
b. Amtel Security System Inc.

c. Delta Scientific Corp.
d. Engineered Parking Systems, Inc.
e. Federal APD, Inc.
f. Magnetic Autocontrol Group.
g. Operator Specialty Co., Inc.; Linear LLC group member.
h. Parking Systems, Inc.
i. PTC Industries.

B. Vehicle Loop Detector System: Self-tuning electronic presence detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light. Include automatic closing timer with adjustable time delay before closing, timer cut-off switch, designed to hold gate open until traffic clears. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location indicated on Drawings, as recommended in writing by detection system manufacturer for pave-over installation.
1. Field-Assembled Loop: Wire, in size indicated for field assembly.
2. Factory-Formed Loop: Wire, preformed in size indicated.
3. Operation:
a. Recognize vehicles within 6 inches (152 mm) of each other on standard-sized loop.
b. Recognize vehicle direction by detecting vehicle moving from one loop to another.
c. Generate reverse count if vehicle backs up after generating directional count in forward direction.
d. Continuous diagnostic monitoring for intermittently operating and failed loops.
e. Crosstalk test between adjacent loops.

C. Active Infrared Vehicle Detector: Emitter/receiver-type presence detector with adjustable detection zone pattern and sensitivity, designed to detect the presence or transit of vehicle in gate pathway by interrupting infrared beam in zone pattern and to emit signal activating gate operator. Include automatic closing timer with adjustable time delay before closing, timer cut-off switch, and vehicle presence detector designed to hold gate open until traffic clears.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install parking control equipment as required for complete and integrated installation.
1. Rough-in electrical connections.

B. Vehicle Loop Detectors: Bury and seal wire loop at locations indicated on Drawings according to manufacturer's written instructions. Connect to parking control equipment operated by detector.

C. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

D. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

3.02 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Parking control equipment will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.03 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain parking control equipment.

END OF SECTION

SECTION 12 2413

ROLLER WINDOW SHADES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes manually- operated roller shades.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

D. Roller-Shade Schedule: Use same designations indicated on Drawings.

1.03 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. BTX Window Automation, Inc.
2. DFB Sales.
3. Draper Inc.
4. Hunter Douglas Contract.
5. Lutron Electronics Co., Inc.
6. MechoShade Systems, Inc.
7. Nysan Solar Control Inc.; Hunter Douglas Company.
8. OEM Shades Inc.
9. Shade Techniques, LLC.
10. Silent Gliss USA, Inc.
11. SM Automatic, Inc.

2.02 ROLLER SHADES

A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
   1. Bead Chains: Stainless steel
      a. Loop Length: Full length of roller shade
      b. Limit Stops: Provide upper and lower ball stops.
      c. Chain-Retainer Type: Chain tensioner, jamb mounted.
   2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.
      a. Provide for shadebands that weigh more than 10 lb (4.5 kg) or for shades as recommended by manufacturer, whichever criteria are more stringent.

B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
   1. Roller Mounting Configuration: Single roller.
   2. Roller Drive-End Location: Right side of inside face of shade.
   3. Direction of Shadeband Roll: Reverse, from front of roller.
   4. Shadeband-to-Roller Attachment: Manufacturer's standard method.

C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

D. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

E. Shadebands:
   1. Shadeband Material: Light-filtering fabric
   2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
      a. Type: Enclosed in sealed pocket of shadeband material]
      b. Color and Finish: As selected by Architect from manufacturer's full range.

F. Installation Accessories:
   1. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
      a. Height: Manufacturer's standard height required to enclose roller and shadeband when shade is fully open, but not less than 3 inches (76 mm).

2. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.03 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
1. Source: Roller-shade manufacturer
2. Type: 100% Thermoplastic Olefin (TPO)
3. Weave: Basket Weave
4. Thickness: .030 inch
5. Roll Width: 96 inches (244 cm)
6. Orientation on Shadeband: Up the bolt.
7. Openness Factor: 3 percent.
8. Color: As selected by Architect from manufacturer's full range.

2.04 ROLLER-SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch (6 mm) per side or 1/2-inch (13-mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).
2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:
1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
2. Skylight Shades: Provide battens and seams at uniform spacings along shadeband as required to ensure shadeband tracking and alignment through its full range of movement without distortion or sag of material.
3. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.01 ROLLER-SHADE INSTALLATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Install roller shades level, plumb, and aligned with adjacent units, according to manufacturer's written instructions.

D. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

E. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

END OF SECTION

SECTION 12 3216

MANUFACTURED PLASTIC-LAMINATE-FACED CASEWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes plastic-laminate-faced cabinets of stock design.

1.02 DEFINITIONS

A. Definitions in the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" apply to the work of this Section.

B. MDF: Medium-density fiberboard.

C. Hardwood Plywood: A panel product composed of layers or plies of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive, and faced both front and back with hardwood veneers.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. CALGreen Submittals:
1. Product Data: For adhesives and composite wood products, documentation indicating that product contains no urea formaldehyde.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

D. Samples: For cabinet finishes.

1.04 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer that is certified for chain of custody by an FSC-accredited certification body.

1.06 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Delamination of components or other failures of glue bond.
b. Warping of components.
c. Failure of operating hardware.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cal-Dak Cabinets.
   2. CampbellRhea.
   3. Case Systems.
   4. CIF Laboratory Solutions.
   5. Diversified Fixture.
   6. Hausmann Industries, Inc.
   7. International Office Products Cooperative.
   8. LSI Corporation of America; a Sagas International company.
   9. Mid Canada Millwork Ltd.
   10. R. C. Smith Company.
   11. Sidney Millwork Company.
   12. Stevens Industries, Inc.
   13. Techline USA, LLC.
   14. Terrill Manufacturing Co. Inc.
   15. Thermo Fisher Scientific.
   16. TMI Systems Design Corporation.
   17. UCMI.
   18. Windham Millwork, Inc.

B. Source Limitations: Obtain plastic-laminate-faced cabinets from single manufacturer.

2.02 CASEWORK, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.
   1. Grade: Custom.
   2. Provide certificates from AWI certification program indicating that casework, including installation, complies with requirements of grades specified.

B. Regional Materials: Casework shall be manufactured within 500 miles (800 km) of Project site.

C. Certified Wood: Casework shall be produced from wood and wood products certified as "FSC Pure" according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and to FSC STD-40-004, "FSC Standard for Chain of Custody Certification."

D. Product Designations: Drawings indicate sizes, configurations, and finish materials of manufactured plastic-laminate-faced cabinets by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes and door and drawer configurations, of same finish materials, and complying with the Specifications may be considered. See Section 01 6000 "Product Requirements."

E. Product Designations: Drawings indicate configurations of manufactured plastic-laminate-faced cabinets by referencing designations of Casework Design Series numbering system in Appendix A of the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

2.03 CASEWORK

A. Design:
   1. Flush overlay.

B. Exposed Materials:
   1. Plastic Laminate: Grade HGS.
      a. Colors and Patterns: As selected by Architect from manufacturer's full range.
   2. Unless otherwise indicated, provide specified edgebanding on all exposed edges.

C. Semiexposed Materials:
   1. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semiexposed surfaces unless otherwise indicated.
   2. Thermoset Decorative Panels: Provide thermoset decorative panels for semiexposed surfaces unless otherwise indicated.
      a. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

2.04 MATERIALS

A. Low-Emitting Materials: Fabricate casework, including countertops, with adhesives and composite wood products containing no urea formaldehyde.

B. Low-Emitting Materials: Adhesives and composite wood products shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated; made without urea formaldehyde; that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Softwood Plywood: DOC PS 1.

E. Particleboard: ANSI A208.1, Grade M-2; that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
   1. Recycled Content: Preconsumer recycled content not less than <Insert number> percent.
   2. Recycled Content: Preconsumer recycled content not less than <Insert number> percent.

F. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. ABET Inc.
      b. Arborite; a division of ITW Canada.
      c. Formica Corporation.
      d. Lamin-Art, Inc.

e. Panolam Industries International Inc.
f. Wilsonart International.

G. Edgebanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 3 mm thick at doors and drawer fronts, 1 mm thick elsewhere.

H. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

I. Edgebanding for Thermoset Decorative Panels: PVC or polyester edgebanding matching thermoset decorative panels.

2.05 COLORS AND FINISHES

A. Wood Colors and Finishes: Match Architect's sample

B. Thermoset Decorative Panel Colors, Patterns, and Finishes: As selected by Architect from thermoset decorative panel manufacturer's full range.

C. Plastic-Laminate Colors, Patterns, and Finishes: As selected by Architect from plastic-laminate manufacturer's full range

D. PVC Edgebanding Color: As selected from casework manufacturer's full range.

2.06 CASEWORK HARDWARE AND ACCESSORIES

A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.
1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.

B. Butt Hinges: Stainless-steel, semiconcealed, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two hinges for doors less than 48 inches (1220 mm) high, and provide three hinges for doors more than 48 inches (1220 mm) high.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, Type B01602, 170 degrees of opening. Provide two hinges for doors less than 48 inches (1220 mm) high, and provide three hinges for doors more than 48 inches (1220 mm) high.

D. Pulls: Solid aluminum wire pulls, fastened from back with two screws. Provide two pulls for drawers more than 24 inches (600 mm) wide.

E. Door Catches: Nylon-roller spring catch. Provide two catches on doors more than 48 inches (1220 mm) high.

F. Drawer Slides: BHMA A156.9, Type B05091.

G. Drawer and Hinged Door Locks: Cylindrical (cam) type, five-pin tumbler, brass with chrome-plated finish, and complying with BHMA A156.11, Grade 1.

PART 3 - EXECUTION

3.01 CASEWORK INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Install casework level, plumb, and true; shim as required, using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

C. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm). Bolt adjacent cabinets together with joints flush, tight, and uniform.

D. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, framing, wood blocking, or reinforcements in walls and partitions. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).

E. Fasten cabinets to adjacent cabinets and to masonry, framing, wood blocking, or reinforcements in walls and partitions to comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

F. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.02 CLEANING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION

SECTION 12 3623

PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Plastic-laminate-clad countertops and backsplashes.

1.02 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

C. Samples: Plastic laminates, for each color, pattern, and surface finish.

D. Product Data: For adhesives and sealants applied onsite and within the building's vapor barrier, include printed statement of VOC content.

E. Product Data: For composite wood and agrifiber products, documentation indicating that product contains no urea formaldehyde.

1.03 INFORMATIONAL SUBMITTALS

A. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: Certified participant in AWI's Quality Certification Program.

1.05 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.01 PLASTIC-LAMINATE COUNTERTOPS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.

1. Provide labels and certificates from AWI certification program indicating that countertops, including installation, comply with requirements of grades specified.

B. Grade: Custom unless indicated otherwise.

C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Abet Laminati, Inc.
      b. Formica Corporation.
      c. Lamin-Art, Inc.
      d. Panolam Industries International, Inc.
      e. Wilsonart International; Div. of Premark International, Inc.

D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   1. As selected by Architect from laminate manufacturer's full range in the following categories:
      a. Solid colors, matte finish.
      b. Wood grains, matte finish.
      c. Patterns, matte finish.

E. Configuration: Provide countertops with the following front and backsplash style:
   1. Front: 1/2-inch (12.7-mm) double bullnose.
   2. Backsplash: Straight, slightly eased at corner.
   3. Endsplash: Matching backsplash (Refer to drawings for locations).

F. Countertops: 3/4-inch- (19-mm-) thick, composite wood material with front edge built up with same material.

G. Backsplashes: 3/4-inch- (19-mm-) thick, composite wood material.

2.02 COUNTERTOP MATERIALS

A. Adhesives: Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.03 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
   2. Particleboard: ANSI A208.1, Grade M-2.
   3. Core Material at Sinks: Particleboard made with exterior glue or medium-density fiberboard made with exterior glue.

2.04 FABRICATION

A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
   1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
   1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.

C. Field Jointing: Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required.
   1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
   1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
   2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c..
   3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

END OF SECTION

SECTION 12 4813

ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Roll-up rail mats.
2. Surface-mounted frames.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
1. Items penetrating floor mats and frames, including door control devices.
2. Divisions between mat sections.
3. Perimeter floor moldings.
4. Custom Graphics: Scale drawing indicating colors.

C. Samples: For each floor mat, tread rail, and frame member.

1.03 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.01 ENTRANCE FLOOR MATS AND FRAMES, GENERAL

A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

2.02 RESILIENT ENTRANCE MATS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Mat & Rubber Company.
2. Balco, Inc.
3. Cactus Mat Mfg. Co.
4. Musson Rubber Company.
5. Pawling Corporation; Architectural Products Division.
6. U.S. Mat & Rubber Corporation.

B. Resilient Link Mats: Reversible vinyl link mats, 7/16 inch (11 mm) thick, with galvanized-spring-steel wire link rods, vulcanized edge-nosing trim, steel-reinforced end trim, and links consisting of rectangular units or continuous strips in a heel-proof, close-weave pattern with openings between links not exceeding 1/8 inch (3.2 mm) wide by 1 inch (25.4 mm) long.
1. Color: As selected by Architect from full range of industry colors.
2. Mat Size: As indicated.

2.03 FRAMES

A. Surface-Mounted Frames: Tapered aluminum frame members, not less than 1-1/2 inches (38 mm) wide, attached to mat at all four edges, with welded mitered corners.
   1. Vinyl Color: As selected by Architect from full range of industry colors.
   2. Aluminum Color: As selected by Architect from full range of industry colors and color densities.

2.04 FABRICATION

A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

B. Coat concealed surfaces of aluminum frames that contact cementitious material with manufacturer's standard protective coating.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install recessed mat frames to comply with manufacturer's written instructions. Set mat tops at height recommended by manufacturer for most effective cleaning action; coordinate tops of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.

B. Install surface-type units to comply with manufacturer's written instructions at locations indicated; coordinate with entrance locations and traffic patterns.

3.02 PROTECTION

A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION

SECTION 12 9300

SITE FURNISHINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes seating, bicycle racks, and trash receptacles.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:

C. Samples: For each exposed product and for each color and texture specified.

1.03 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.01 SEATING AND TABLES

A. Products: Subject to compliance with requirements, provide one of the following:
1. A & T Iron Works, Inc.
2. BCI Burke Company, LLC.
3. BRP Enterprises, Inc.
4. Canterbury International.
5. Columbia Cascade Company.
6. FairWeather Site Furnishings; Division of Leader Manufacturing, Inc.
7. Fibrex Group Inc. (The).
8. Forms+Surfaces.
9. GameTime; a PlayCore, Inc. company.
10. Landscape Forms.
11. Landscape Structures Inc.
12. L. A. Steelcraft.
13. Miracle Recreation Equipment Co.; a division of PlayPower, Inc.
14. Recreation Creations, Inc.
15. RPI.
16. Sitecraft.
17. Smith & Hawken, Ltd.
18. Urban Accessories, Inc.
19. Victor Stanley, Inc.

B. Frame: Steel.

C. Seat and Back:
1. Material:
   a. Recycled Plastic Planks: Evenly spaced, parallel.
2. Seat Surface Shape: Flat.
3. Arms: None

4. Seating Configuration: Multiple units, as indicated.
   a. Straight shape.

D. Steel Finish: Galvanized and color coated.
   1. Color: As selected by Architect from manufacturer's full range.

E. HDPE Color: As selected by Architect from manufacturer's full range.

2.02 BICYCLE RACKS

A. Products: Subject to compliance with requirements, provide one of the following:
   1. A A A Ribbon Rack Co., Inc.; Division of Brandir International, Inc.
   2. American Bicycle Security Company.
   3. Columbia Cascade Company.
   4. Cora Bike Rack.
   5. CycleSafe.
   6. Dero Bike Rack Co.
   7. Landscape Structures Inc.
   8. RPI.
   9. Urban Accessories, Inc.

B. Bicycle Rack Construction:
   1. Frame: Galvanized steel.
      a. Pipe OD: Not less than 1-5/8 inches (41 mm).
      b. Locking Bars: Solid round bar, not less than 3/4 inch (19 mm) in diameter.
   2. Style: As indicated.
      a. Capacity: Designed to accommodate no fewer than two bicycles.
   3. Security: Designed to lock wheel and frame.
   4. Accessories: Base covers for each pipe and tubing anchored end and Wheel stops.
   5. Installation Method: Bolted to cast-in anchor bolts.

C. Steel Finish: Color coated.
   1. Color: As selected by Architect from manufacturer's full range.

2.03 MATERIALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; free of surface blemishes and complying with the following:
   1. Rolled or Cold-Finished Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).
   2. Extruded Bars, Rods, Wire, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
   3. Structural Pipe and Tube: ASTM B 429/B 429M.
   4. Sheet and Plate: ASTM B 209 (ASTM B 209M).
   5. Castings: ASTM B 26/B 26M.

B. Steel and Iron: Free of surface blemishes and complying with the following:
   1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
   2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53/A 53M, or electric-resistance-welded pipe complying with ASTM A 135/A 135M.
   3. Tubing: Cold-formed steel tubing complying with ASTM A 500/A 500M.
   4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 1011/A 1011M and complying with dimensional tolerances in ASTM A 500/A 500M; zinc coated internally and externally.

5. Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.
6. Perforated Metal: From steel sheet not less than 0.075-inch (1.9-mm nominal) thickness; manufacturer's standard perforation pattern.
7. Expanded Metal: Carbon-steel sheets, deburred after expansion, and complying with ASTM F 1267.
8. Malleable-Iron Castings: ASTM A 47/A 47M, grade as recommended by fabricator for type of use intended.
9. Gray-Iron Castings: ASTM A 48/A 48M, Class 200.

C. Fiberglass: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.

D. Plastic: Color impregnated, color and UV-light stabilized, and mold resistant.
1. Polyethylene: Fabricated from virgin plastic HDPE resin.
2. Recycled Content of Polyethylene: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

E. Anchors, Fasteners, Fittings, and Hardware: Galvanized steel; commercial quality, concealed, recessed, and capped or plugged.
1. Angle Anchors: For inconspicuously bolting legs of site furnishings to on grade substrate; one per leg

F. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:
1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, polymer film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil (0.0076 mm) thick.
2. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.04 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

E. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.05 ALUMINUM FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.06 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

B. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

2.07 IRON FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and [**securely anchored**] [**positioned**] at locations indicated on Drawings.

END OF SECTION

SECTION 12 9314

BIKE LOCKERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. High Strength Sheet Molded Compound (HSMC) plastic composite, modular Bicycle Storage Lockers and hardware.

1.2 SUBMITTALS FOR REVIEW

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

B. Samples: For each type of finish indicated

C. Product Layout Drawings: For layout options and site dimensions.

1.3 SUBMITTALS FOR INFORMATION

A. Manufacturer information: Installation Guide and Owner's Manual

B. Maintenance Data.

C. Certifications: For exterior HSMC Molded material, certified by manufacturer.

1.4 QUALITY ASSURANCE

A. Products: Manufactured to ISO 9000 or ISO 14000 requirements.

B. Manufacturer Qualifications: A company specialized in the manufacture of fiberglass reinforced plastic/SMC composite.

C. Conformance: Conform to Class I Bicycle Parking Facilities requirements.

1.5 DELIVERY, STORAGE AND HANDLING

A. Inspect bicycle locker components on delivery for carrier damage. Store bicycle locker components in original undamaged packaging in an area sheltered from weather until ready for installation. Inspect bicycle locker components prior to setup and installation.

1.6 WARRANTY

A. Warranty covers materials and workmanship

B. Warranty Period:

1. Five (5) years from date of invoice for all manufacturer's non-HSMC components.

C. Warranty period for mechanical locks: Two (2) years from date of invoice.

PART 2 PRODUCTS

2.1 DESIGN CRITERIA & CONSTRUCTION

A. Bicycle Lockers System: Interlocking locker system that accommodates expansion. Enclosed and lockable for security and capacity within for storing all conventional bike sizes. Weather and graffiti resistant.

B. Products: Dura Bike Locker by Hannan Specialties, Inc., 3790 Bradview Dr., Sacramento, CA 95827. (800) 722 2453 or approved equal.

C. Vertical / Horizontal Members, Channel:

1. Modular / Interlocking Design: Bicycle lockers with interlocking design for configuration into integrated systems is required.
2. Material: Hot compression molded fiberglass reinforced plastic (HSMC) using polyester resin.
3. Construction: 2 inch deep reinforced ribs, interlocking ends and fastening points molded-in with concealed fasteners.

D. Top Panels: Fiberglass HSMC top panels provide high mechanical strength and rigidity, high surface quality, reduced heat build-up, and rust or denting resistance.

1. Material: Hot compression molded fiberglass reinforced plastic (HSMC) using polyester resin.
2. Construction: Crowned stipple textured surface with 2 inch deep reinforced ribs and flush construction parallel to the Door Panel.

E. End Panels: Deep impressions to stiffen bottom and contoured corners.

1. Material: Thermoformed high-impact ABS sheet
2. Construction: Recessed center to accept display panel inserts

F. Design bicycle storage assemblies and provide clearances that will allow for installation tolerances and free unobstructed access to users.

G. Assemble units with concealed fasteners or locate fasteners in areas inaccessible when locker units are closed.

H. Doors: Manufactured to same material standards as the locker body and include recessed tamper proof door jambs. Doors should open and close easily without being forced.

1. Integrated full length Latching System to help prevent door prying
2. Built-in Rotary type mechanical locking mechanism (other types are available)
3. Material: Hot compression molded fiberglass reinforced plastic (HSMC) using polyester resin.
4. Construction: Crowned stipple textured surface with 2 inch deep reinforced ribs and flush construction parallel to the Top Panel.

I. Door Locks: Pop-out T-Handle Vending type mechanism with high security removable plug type cylinder lock for T-handle, UL 437 listed to exceed one million cycles operational testing. Locks are recessed and mounted internally for security.

1. Key each locker door cylinder separately and supply (3) keys with each.
2. All lock cylinders shall be completely re-keyable to new combinations.

3. Contractor to label door keys with corresponding locker door number per manufacturer's requirement
4. Lock Cylinders: Pick-resistant, high security type with angled key cuts and rotating disc tumblers as manufactured by Alboy Security Locks, Inc. (Executive Series) or approved equal.
5. T-Handle Assembly: NAMA Rotary Vending Standard countersunk within door face.
6. Furnish locking system in a factory restricted key selection for which uncut keys are not made available from the manufacturer's factory or any other source by normal distribution methods. All key duplication must be done at the factory or authorized service center upon properly authorized signature.

J. Identification: Include numerical identification aluminum plate with 3/4 inch high photo etched numbers mounted behind stainless steel escutcheon plate on locker door. Locker doors shall be labeled sequentially from (#) [001] to (#) [004] as directed by Owner.

K. Roof: Passive draining, having either channels or crowned top panels to remove water.

L. Leveling Brackets: Vertical adjustment of four (4) inches

1. Concealed adjustable leveling brackets provided as integral component of framework.

M. Anchors: Securely attach lockers to mounting surface, where specified, on inside of locker.

1. Anchoring system shall be removable to enable lockers to be relocated if necessary.
2. Anchors and Fasteners to be structurally stressed not more than 50 percent of allowable stress when maximum loads are applied.

N. Hinge: Concealed, full length, piano hinge, corrosion resistant finish, 14 gauge. steel with stainless steel rod. Pop-riveted attachment is not allowed.

O. Partitions: For dividing lockers into two compartments and separating lockers.

1. Exterior type Orientated Strand Board (OSB) panels or equivalent material with sealed edges and coated surfaces (standard).

2.2 BICYCLE STORAGE LOCKERS DESCRIPTION

A. Series: CycleSafe ProPark

B. Models: Single-Tier (1-2) bike capacity

1. Standard Model: SM, no windows.

Access Type:	Starter #	Adder #
2. Double-Entry: two-door access (M02)	10001	12500
3. Single-Entry: one-door access (S01)	10017	10019

C. Locker Dimensions:

1. Height: 4 feet, 2 1/2 inches.
2. Width: (Starter) 3 feet, 6 inches; (Adder) 3 feet, 2 inches
3. Depth: 6 feet, 5 1/2 inches.
4. Row Length: Varies depending upon banking configurations.

D. Bicycle Parking Spaces: Locker Capacity

1. Two-door, double ended access lockers: Two (2) triangular interior spaces per two-door locker unit to be no less than forty-six (46) inches high, seventy-two (72) inches deep, thirty-one (31) inches wide at opening and six (6) inches wide at rear.
2. One-door, single ended access lockers: One (1) rectangular interior space per single-door locker unit to be no less than forty-six (46) inches high, seventy-two (72) inches long and thirty-one (31) inches wide at opening.

2.3 ACCESSORIES

A. Swing-Handle Latch with stainless steel bracket for utilizing 3/8" thick Padlock or standard 3/4" maximum thickness bicycle U-Lock.

B. Electronic (Keyless) Door Access Locker Management (contact manufacturer for information and specification details).

1. Keypad and Key Entry: Trilogy DL6100.
2. Keypad, Key, Proximity: Trilogy PDL6100.

C. Locker Door Identification Number Plates: Manufacturer's standard photo etched aluminum plate, concealed mounting, sequentially numbered with black numbers or letters of at least 3/4 inch (19mm) high.

D. Lock Weather Shield: to protect lock and T-Handle from moisture/freezing.

E. End Panel Options:

1. View-Thru polycarbonate window: for security.
2. Perforated metal panel punched bike logo (optional) others (custom).
3. Bike logo silhouette vinyl sticker.

F. Coat Hooks: partition mounted for hanging personal items.

G. Floor Plate: One per bike space.

H. Blue 2-3/8 inch x 4-5/8 inch Bike Parking Decal:

I. Door Check / Holdback Kit: for propping door open to allow unrestricted access.

J. Key Safe: Mechanical key storage box with programmable coded access.

2.4 FINISHES

A. Manufacturer's factory applied oven baked on, semi-gloss stipple texture finish.

B. Bicycle locker finish: Exterior coated with Industrial grade two-part acrylic aliphatic polyurethane finish for maximum UV protection and graffiti cleaning resistance (ASTM Type 5 Industrial Maintenance Coating), PPG PITTHANE® ULTRA or equal.

C. Locker Color: Architect to select from manufacturer's standard colors.

PART 3 EXECUTION

3.1 INSTALLATION

A. Where installation on concrete is specified, install lockers on minimum 4 inch thick concrete slabs, sloped to provide drainage (maximum 2 degrees). For other improved surfaces, such as pavers or asphalt, contact the Manufacturer for alternate installation procedures.

B. Fasten to concrete slab or improved surfaces with 5/16 inch RedHead style expansion anchors (furnished).

C. Set plumb and aligned. Level lockers true to plane with leveling plates and shims.

D. Field alteration of doors and frames to accommodate field conditions is prohibited.

E. Adjust doors, latching bar fastening screws, and hardware to operate smoothly, easily, properly, and without binding.

END OF SECTION

SECTION 13 3419

METAL BUILDING SYSTEMS

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. Structural-steel framing.

B. Related Sections include but are not limited to:

1. Division 01 Section “Quality Requirements” for additional quality assurance and testing requirements.
2. Division 07 Section “Insulated Metal Wall and Roof Panels.”
3. Division 07 Section “Metal Wall Panels.”
4. Division 08 Section “Hollow Metal Doors and Frames.”
5. Division 08 Section “Overhead Coiling Service Doors.”

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

1. Structural-steel-framing system.
2. Metal roof panels.
3. Metal wall panels.
4. Flashing and trim.
5. Accessories.

B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.

1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
3. Metal Roof and Wall Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners. Show roof-mounted items including equipment supports, pipe supports and penetrations, and items mounted on roof curbs.
4. Accessory Drawings: Include details for flashing and trim, gutters, downspouts, and vents at a scale of not less than 1-1/2 inches per 12 inches:

C. Samples for Initial Selection: For item with factory-applied color finish.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:

1. Metal Roof and Wall Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.

E. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified steel erector and metal roof and wall panel installer.

B. Welding certificates.

C. Metal Building System Certificate: For metal building system, from manufacturer.

1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

a. Name and location of Project.
b. Order number.
c. Name of manufacturer.
d. Name of Contractor.
e. Building dimensions including width, length, height, and roof slope.
f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
g. Governing building code and year of edition.
h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.

j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
k. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.

D. Erector Certificates: For each product, from manufacturer.

E. Manufacturer Certificates: For each product, from manufacturer.

F. Material Test Reports: For each of the following products:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

G. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA, and registered and approved by authorities having jurisdiction to perform fabrication work without special inspection.

1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer licensed in the State of California.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Metal Roof and Wall Panel Installer Qualifications: An experienced installer who specializes installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

D. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."

F. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

G. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

H. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Contractor, metal roof and wall panel Installer, metal roof and wall panel manufacturer's representative, and installers whose work interfaces with or affects metal roof and wall panels including installers of doors, windows, roof accessories, and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Review flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
6. Review methods and procedures related to metal building systems including, but not limited to, the following:

   a. Condition of foundations and other preparatory work performed by other trades.
   b. Structural load limitations.
   c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
   d. Required tests, inspections, and certifications.
   e. Unfavorable weather and forecasted weather conditions.

7. Review methods and procedures related to metal roof and wall panel assemblies including, but not limited to, the following:

   a. Compliance with requirements for framing and support conditions, including alignment, flatness, and attachment to structural members.
   b. Structural limitations of framing members during and after panel installation.
   c. Flashings, special details, roof drainage, penetrations, equipment curbs, and condition of other construction that will affect metal panels.
   d. Temporary protection requirements for metal panel assembly during and after installation.
   e. Observation and repair after metal panel installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weather tight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements:

1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal panels without field measurements, or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.10 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Division 03 Section “Cast-in-Place Concrete.”

B. Coordinate installation of thermal insulation, roof curbs, equipment supports, and roof penetrations.

C. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leak proof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weather tightness Warranty for Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that leak or otherwise fail to remain weather tight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL BUILDING SYSTEM PERFORMANCE

A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings and not less than required by ASCE/SEI 7.
2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:

a. Purlins and Rafters: Vertical deflection of **1/240** of the span.
b. Girts: Horizontal deflection of **1/180** of the span.
c. Metal Roof Panels: Vertical deflection of **1/180** of the span.
d. Metal Wall Panels: Horizontal deflection of **1/180** of the span.
e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

3. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:

a. Lateral Drift: Maximum of **1/200** of the building height.

C. Seismic Performance: Metal building systems shall withstand the effects of earthquake motions determined according to the California Building Code and ASCE/SEI 7.

D. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F ambient; 180 deg F material surfaces.

E. Air Infiltration for Metal Roof Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 1.57 lbf/sq. ft.

F. Air Infiltration for Metal Wall Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at static-air-pressure difference of 1.57 lbf/sq. ft.

G. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft.

H. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft.

I. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

J. Energy Performance: Provide roof panels with initial solar reflectance not less than 0.75 and emissivity not less than 0.75 when tested according to CRRC.

2.2 MANUFACTURERS

A. Basis-of-Design: Metal building system framing, roof, and wall panels specified in this Section are based on products manufactured by the following:

1. Butler Manufacturing Company; a BlueScope Steel company.

a. Subject to compliance with requirements, provide products indicated or comparable products by one of the following:

1) Metallic Building Company; Division of NCI Building Systems, L.P.
2) Borga Steel Buildings and Components
3) VP Buildings; a BlueScope Steel company.

2.3 METAL BUILDING SYSTEM

A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

1. Provide metal building system of size and with bay spacings, roof slopes, and spans indicated on Drawings.

B. Primary-Frame Type: Rigid clear span, solid-member, structural-framing system without interior columns.

C. Secondary-Frame Type: Manufacturer's standard purlins, joists, and girts.

D. End-Wall Framing: Engineer end walls to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.

E. Eave Height: Manufacturer's standard height, as indicated by nominal height on Drawings.

F. Bay Spacing: As indicated on Drawings.

G. Roof Slope: As indicated on Drawings; 2 inch per 12 inches minimum.

H. Roof System: Manufacturer's standard trapezoidal-rib, standing-seam metal roof panels.

I. Exterior Wall System: Manufacturer's standard tapered-rib, exposed-fastener metal wall panels.

2.4 STRUCTURAL-STEEL FRAMING

A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
3. Exterior Column Type: Uniform depth or tapered as indicated on drawings.
4. Rafter Type: Uniform depth or tapered.

B. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly.

C. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

1. Purlins and Girts: C or Z-shaped sections with minimum 2-1/2-inch wide flanges with stiffening lips angled 40 to 50 degrees from flange. Depth as required to comply with system performance requirements.
2. Eave Struts: Unequal-flange C-shaped sections to provide adequate backup for metal panels.
3. Flange Bracing: Minimum 2-by-2-by-1/8-inchstructural-steel angles.
4. Sag Bracing: Minimum 1-by-1-by-1/8-inchstructural-steel angles.
5. Base or Sill Angles: Minimum 3-by-2-inch zinc-coated (galvanized) steel sheet.
6. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
7. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
8. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

D. Wind Bracing: Steel rods, ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50; or ASTM A 529/A 529M, Grade 50; minimum 1/2-inchdiameter steel; threaded full length or threaded a minimum of 6 inches at each end.

1. Rigid Portal Frames: Where indicated on Drawings, provide rigid portal frames fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.

E. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated or hot-dip galvanized bolts for structural-framing components that are galvanized.

F. Steel Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.

3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70.
7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80, or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80; with G60 coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 (230 through 550), or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80 (340 through 550); with G90 (Z275) coating designation.

9. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers. Finish, hot-dip zinc coating, ASTM A 153/A 153M, Class C.
10. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers. Finish, hot-dip zinc coating, ASTM A 153/A 153M, Class C.
11. Headed Anchor Rods: minimum ASTM F 1554, Grade 36 unless otherwise specified on drawings.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436.
    e. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

12. Threaded Rods: minimum ASTM A 193/A 193M, Grade 50 unless otherwise specified on drawings.

    a. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
    b. Washers: ASTM F 436hardened carbon steel.
    c. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

G. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.

    a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.

2. Prime galvanized members with specified primer after phosphoric acid pretreatment.
3. Primer: Manufacturer's standard.

2.5 METAL ROOF PANELS

A. Trapezoidal-Rib, Standing-Seam Metal Roof Panels: Panels formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch (24 gage) nominal thickness.

   a. Exterior Finish: Fluoropolymer.
   b. Color: As selected by Architect from manufacturer's full range.

2. Clips: Manufacturer's standard, floating type to accommodate thermal movement; fabricated from zinc-coated (galvanized) steel sheet.
3. Joint Type: Mechanically seamed, [folded according to manufacturer's standard.
4. Panel Coverage: 24 inches.
5. Panel Height: 3 inches.
6. Uplift Rating: UL 90.

2.6 METAL WALL PANELS

A. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Zinc-coated (galvanized) steel sheet, 0.028-inch (24 gage) nominal thickness.

   a. Exterior Finish: Fluoropolymer.
   b. Color: As selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches on center.
3. Panel Coverage: 36 inches.
4. Panel Height: Manufacturer's standard, 1 inch minimum, 1-1/2 inch maximum.

2.7 METAL PANEL MATERIAL AND FINISHES

A. Material: Restricted-flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
2. Surface: Smooth, flat finish.

B. Exposed Coil-Coated Finish: AAMA 621 Three-coat fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

C. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.8 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inchthick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weather tight construction.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inchthick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weather tight construction.

D. Flashing and Trim: Formed from 0.028-inch (24 gage) nominal thickness, metallic-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.

E. Gutters: Formed from not less than 0.028-inch (24 gage) nominal-thickness, metallic-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inchlong sections, sized according to SMACNA's "Architectural Sheet Metal Manual."

1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: Bronze, copper, or aluminum wire ball type.

F. Downspouts: Formed from not less than 0.028-inch (24 gage) nominal-thickness, zinc-coated (galvanized) steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-footlong sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Roof Ventilators: Continuous or sectional-ridge gravity type complete with hardware, flashing, closures, and fittings. Factory-engineered and -fabricated, continuous unit; fabricated from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal roof panels. Fabricated in minimum 10-foot long sections. Provide throat size and total length indicated, complete with side baffles, ventilator assembly, end caps, splice plates, and reinforcing diaphragms.

1. Bird Screening: 1/2-inch square mesh, 0.041-inch wire of galvanized steel or aluminum.
2. Throat Size: 9 or 12 inches, as standard with manufacturer, and as required to comply with ventilation requirements.

H. Louvers: Size and design indicated on Mechanical Drawings; self-framing and self-flashing. Fabricate welded frames from minimum 0.052-inch nominal-thickness, metallic-coated steel sheet; finished to match metal wall panels. Form blades from 0.040-inch nominal-thickness, metallic-coated steel sheet; folded or beaded at edges, set at an angle that excludes driving rains, and secured to frames by riveting or welding. Fabricate louvers with equal blade spacing to produce uniform appearance.

1. Blades: as indicated on drawings.
2. Free Area: Not less than 7.0 sq. ft. for 48-inch wide by 48-inch high louver.
3. Bird Screening: Galvanized steel, 1/2-inch square mesh, 0.041-inch wire; with rewirable frames, removable and secured with clips; fabricated of same kind and form of metal and with same finish as louvers, mounted to interior face of louvers.
4. Vertical Mullions: Provide mullions at spacings recommended by manufacturer, or 72 inches on center whichever is less.

I. Roof Curbs: Fabricated from minimum 0.052-inch nominal-thickness, metallic-coated steel sheet prepainted with coil coating; finished to match metal roof panels; with welded top box and bottom skirt, and integral full-length cricket; capable of withstanding loads of size and height indicated.

1. Curb Subframing: Fabricated from 0.064-inch nominal-thickness, angle-, C-, or Z-shaped metallic-coated steel sheet.
2. Insulation: 1-inch thick, rigid type.

J. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

K. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.

1. Fasteners for Metal Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM sealing washer.

2. Fasteners for Metal Wall Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with EPDM sealing washers bearing on weather side of metal panels.
3. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
4. Blind Fasteners: Stainless-steel rivets.

L. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

M. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

N. Metal Panel Sealants:

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
2. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weather tight; and as recommended by metal building system manufacturer.

2.9 SOURCE QUALITY CONTROL

A. Special shop inspections will not be required, manufacturer shall be registered and approved by authorities having jurisdiction to perform such Work without special inspection.

1. After fabrication, submit certificate of compliance with copy to authorities having jurisdiction certifying that Work was performed according to Contract requirements.

2.10 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with base plates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.

3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing.
5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with base plates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.
2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level base plates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.

a. Joint Type: Snug tightened or pretensioned.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as doors and windows.
3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

I. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

B. Coordination: Coordinate installation of metal roof and wall panels with roof curbs, insulation system, door frames, windows, service doors, flashing and trim, and similar items.

C. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes. Field cutting of metal panels by torch is not permitted.
2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

D. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weather tight enclosure. Avoid "panel creep" or application not true to line.

E. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

F. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.

2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at rake edges, rake walls, ridges, and each side of ridge caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.
1.

3.6 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
4. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
5. Install screw fasteners in predrilled holes.
6. Install flashing and trim as metal wall panel work proceeds.
7. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
8. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
9. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

3.7 THERMAL INSULATION INSTALLATION

A. Thermal insulation shall be installed in accordance with requirements of Division 07 Section "Thermal Insulation."

3.8 DOOR AND WINDOW FRAME INSTALLATION

A. Door and window frames shall be installed in accordance applicable Division 08 Sections; coordinate installation of door and window frames with metal roof and wall panels, and flashing and trim.

3.9 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weather tight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Coordinate installation of flashing and trim with roof curbs, door frames, windows, service doors, and similar items.
2. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
3. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches on center using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inchtelescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches on center in between. Provide elbows at base of downspouts to direct water away from building.

E. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:

1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:

   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

C. Product will be considered defective if it does not pass tests and inspections.

3.11 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing and accessories.

1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION