Attachment A Part 1 of 3

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MONTEREY COUNTY

PUBLIC WORKS, FACILITIES & PARKS

VOLUME ONE OF TWO

PROJECT MANUAL

331 NORTH SANBORN ROAD- ALISAL INTEGRATED HEALTH CENTER
PROJECT NO. 1701
BID NO. 10817

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TITLE SHEET

BOARD OF SUPERVISORS
COUNTY OF MONTEREY
STATE OF CALIFORNIA

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John M. Phillips
Mary L. Adams
Luis A. Alejo
Chris Lopez

Charles J. McKee County Administrative Officer

Randy Ishii, MS, PE, TE, PTOE Director, County of Monterey Department Public Works Facilities and Parks

Approved as to Form	Approved as to Indemnity/ Insurance Language	Approved as to Fiscal Terms
Office of the County Counsel Leslie J. Girard, County Counsel	Office of the County Counsel Leslie J. Girard, County Counsel	Rupa Shah, County Auditor-Controller
By: DocuSigned by: Mary Grace Perry A1933B26E717442...	By DocuSigned by: Danielle P. Mancuso 2AFDFB99D2744CC...	By: DocuSigned by: Gary Giboney D3834BFEC1D8449...
Mary Grace Perry Deputy County Counsel	Danielle P. Mancuso Risk Manager	Gary Giboney Chief Deputy Auditor-Controller
Date: 9/10/2021 | 4:24 PM PDT	Date: 9/13/2021 | 8:11 AM PDT	Date: 9/13/2021 | 8:22 AM PDT

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER
PROJECT NO. 1701 BID NO. 10817

The current General Prevailing Wage determined by the State of California Director of Industrial Relations is on file with the Monterey County Department of Public Works Facilities and Parks

1441 SCHILLING PLACE-SOUTH, 2ND FLOOR
SALINAS, CALIFORNIA 93901-2438
(831) 755-4800

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SIGNATURE SHEET

PROJECT MANUAL

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER
PROJECT NO. 1701 BID NO. 10817

The drawings and specifications were prepared by THE PAUL DAVIS PARTNERSHIP, LLP, under the direct supervision of Paul W. Davis.

Signature	Date
	5/19/21

Affix stamp below

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PROJECT CONTACTS

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER
PROJECT NO. 1701
BID NO. 10817

OWNER

COUNTY OF MONTEREY
PUBLIC WORKS, FACILITIES & PARKS
ATTN: FLORENCE KABWASA-GREEN, PROJECT MANAGER
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INSTRUCTIONS TO BIDDERS

Division 002000

This "Instructions to Bidders" is intended to assist bidders in the preparation of their bids. If there is any inconsistency between the terms herein and any of the other Contract Documents, the terms in the other Contract Documents shall prevail.

1. Notice To Bidders/Invitation to Submit Bids

County of Monterey (County) invites bids to be submitted at such time and place stated in the Notice to Bidders. **The Notice to Bidders is advertised in a newspaper of general circulation and is posted as a separate document on the Monterey County** Department of Public Works, Facilities and Parks (PWFP)**website, project page.** This "Instructions to Bidders" is intended to assist bidders in the preparation of their bids. If there is any inconsistency between the terms herein and any of the other Contract Documents, the terms in the other Contract Documents shall prevail.

2. Examination of Site, Bidding and Contract Documents

Project specifications, drawings, and other Contract Documents may be examined at PWFP, 1441 SCHILLING PLACE SOUTH, SECOND FLOOR, SALINAS, CALIFORNIA 93901, TELEPHONE NO. (831)755-4800. Also, Project documents may be viewed, downloaded, and printed **for free** directly from the Monterey County website PWFP project page: https://www.co.monterey.ca.us/government/departments-i-z/public-works-facilities-parks/public-works select *For Public Works Bid Projects, please visit the eBidBoard Site*, then select the specified project. Interested parties must register to view/download documents. Alternately, interested parties may engage a printing service of their choosing to download and print documents from County project page. Project documents may also be available to view at builders' exchanges listed on the project page or members of eBidBoard can access materials directly from its website.

Each bidder shall become fully acquainted with the conditions relating to the construction and labor in order to understand fully the facilities, difficulties, and restrictions attending the execution of the work under the contract. Bidders shall thoroughly examine and become familiar with the plans, specifications, working details, and existing conditions. The failure or omission of any bidder to receive or examine any Contract Documents, form, instrument, addendum, or other document, or to visit the site and become acquainted with conditions there existing shall in no way relieve such bidder from obligations with respect to such bid or to the contract. Submission of a bid shall be taken as prima facie evidence of compliance with this section.

3. Mandatory Bidder's Meeting

If a mandatory bidders' meeting is required in the Notice to Bidders, then a qualified representative of the bidder's firm must attend at the stated time and place. Failure to attend will be cause for rejection of the bid. Any bid received from a bidder who did not fully attend the mandatory bidders' meeting at the stated time and place will be returned unopened. "Fully attend" means attending the entire meeting from start to finish; late arrivals and early departures may be cause for rejection of the bid.

4. Contractor's License

Each bidder must be licensed to perform the project in accordance with the provisions of Contractors' State Licensing Law, Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code, and in accordance with the Notice to Bidders. Contractor's license number and expiration date of the license shall appear on the bid. The classification of Contractor's License required for this project is "A" – General Engineering Contractor or "B" - General Building Contractor.

5. Contractor Registration with the Department of Industrial Relations
Attention is directed to Department of Industrial Relations (sometimes referred to as "DIR") Contractor registration for public works projects. Pursuant to Labor Code Section 1771.1(a), a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4101 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. It is not a violation of Labor Code Section 1771.1(a) for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Labor Code Section 1725.5 at the time the contract is awarded.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. For Contractor Registration, go to: http://www.dir.ca.gov/Public-Works/PublicWorks.html.

6. Preparation of Bid Form
All bids must be submitted on the prescribed form. All blanks in the bid form must be appropriately filled in, and all prices must be stated in both words and figures, with the lump sum for which the bid is made. All bids must be submitted in sealed envelopes bearing on the outside the bidder's name and address, the name of the project, the bid date and time, and the bid package number for which the bid is submitted. It is the sole responsibility of the bidder to see that the bid is received at the proper place and in proper time. Any bid received after the scheduled closing time for receipt of bids will be returned to the bidder unopened. Bidder's failure to submit all required documents strictly as required entitles County to reject the Bid as nonresponsive. All Bidders must submit Bids containing each of the fully executed documents supplied in this Project Manual.

7. Erasures
The bid submitted must not contain any erasures, interlineations, or other corrections unless each such correction is suitably authenticated by affixing in the margin immediately opposite the correction the surname or surnames of the person or persons signing the bid, in the named person's own handwriting.

8. Modifications
Changes in or additions to the bid form, recapitulations of the work bid upon, alternative proposals, or any other modification of the bid form which is not specifically called for in the Contract Documents may result in County's rejection of the bid as not being responsive to the notice to bid. No oral or telephonic modification of any bid submitted will be considered.

9. Signature
The bid must be signed in the name of the bidder and must bear the signature in longhand of the person or persons duly authorized to sign the bid. An original signature is required.

10. Interpretation of Plans and Documents
If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the plans, specifications, or other Contract Documents, or finds discrepancies in or omissions from the plans and specifications, he/she may submit to County a written request for an interpretation or correction thereof. The person submitting the request shall be responsible for its prompt delivery. Any interpretation or correction of the Contract Documents will be made only by official project Q&A (questions/answers) or addendum duly issued, and a copy of such will be posted on the Monterey County website PWFP project page:
https://www.co.monterey.ca.us/government/departments-i-z/public-works-facilities-parks/public-works
select *For Public Works Bid Projects, please visit the eBidBoard Site*, then select the specified project].

No oral interpretation of any provision in the Contract Documents will be made.

11. Bidding Questions

All questions regarding the project during the bidding process must be made in writing to the attention of the designated project bidding coordinator via E-mail, United States Postal Service (U.S.P.S.) mail, or via facsimile (fax). Contact information is listed on the Monterey County website PWFP project page: https://www.co.monterey.ca.us/government/departments-i-z/public-works-facilities-parks/public-works, select *For Public Works Bid Projects, please visit the eBidBoard Site*, then select the specified project. No telephone or verbal questions will be accepted. ***QUESTIONS RECEIVED AFTER THE DEADLINE LISTED IN THE NOTICE TO BIDDERS WILL NOT BE ACCEPTED.*** Answers to all questions and any addendum regarding the project will be posted on the Project Page listed above.

Addenda may also be issued to modify the Bidding Documents as deemed advisable by County. Addenda shall be acknowledged by number in Division 003000 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from County.

12. Bid Security

Each bid shall be accompanied by bidder's security in the form of cash, a certified or cashier's check payable to County, or a satisfactory Bid Bond in the form included in this bid book (Division 004400) in favor of County executed by the bidder as principal and a satisfactory corporate surety authorized to do business in the State of California as an admitted surety insurer, in an amount not less than ten percent (10%) of the total bid amount. The security shall be given as a guarantee that, if the contract is awarded to the bidder, the bidder will execute the contract, provide any required insurance certificates, and provide any payment and performance bonds required by the contract within ten (10) days after the bidder receives the Notice of Intent to Award letter. After ten (10) days, if the executed agreement, proper bonds and insurance documents are not submitted by the lowest responsive bidder, County has the right to determine that bid non-responsive and contact the second lowest responsive bidder.

13. Listing Subcontractors

Each bidder shall submit with the sealed bid a list of the proposed Subcontractors for the Project as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code Section 4100, et seq.). Forms for this purpose are furnished with the Contract and bid documents. This includes all Subcontractors performing work in an amount in excess of one half of one percent of the prime Contractor's total bid. All information is required. Effective July 2014, AB44 specifically requires that the California Contractor license number of each Subcontractor be provided.

14. Prevailing Wage

The Director of the Department of Industrial Relations has determined the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract. Copies of the prevailing rate of per diem wages are on file and shall be made available to any interested party on request in the Public Works, Facilities & Parks Department located at 1441 SCHILLING PLACE SOUTH, SECOND FLOOR, SALINAS, CALIFORNIA 93901-2438. It shall be mandatory upon Contractor to whom the Contract is awarded, and upon any Subcontractor under Contractor, to pay not less than said specified rates to all workers employed by them in the execution of the Contract.

15. Workers' Compensation Certificate

In accordance with the provisions of Section 3700 of the Labor Code, Contractor shall secure the payment of Workers' Compensation Insurance to its employees. The following certificate, which such

form is included as part of the Contract Documents, shall accompany each bid:

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

16. Good Faith Effort to Employ Residents of Monterey Bay Area:
In accordance with Section 5.08.120 of the Monterey County Code (MCC), all Contractors and Subcontractors providing work, laborers, or material suppliers on the Project shall make a good faith effort to employ qualified individuals who are, and have been for at least one (1) year out of the past three (3) years prior to the opening of bids, residents of the Monterey Bay Area in sufficient numbers so that no less than fifty percent (50%) of Contractor's total construction work force, on the Project, including any Subcontractor work force (with exception of specialty Subcontractor items identified in the bid items) measured in labor work hours is comprised of Monterey Bay Area residents. A certification form relating to compliance with Section 5.08.120 is furnished with the bid documents. Bidder must complete the certification form and submit the certification form with the sealed bid. The Monterey County Board of Supervisors may deem your bid nonresponsive for failure to abide by the good faith local hiring provisions of MCC Section 5.08.120.

If any Contractor submitting a bid for a Contract for Public Works of Improvement fails to abide by the good faith local employment provisions of this Section, Contractor may be declared by the Board to be a nonresponsive bidder for purposes of this Chapter. If a Contractor lists in his or her bid a Subcontractor who is currently disqualified under the terms of MCC Section 5.08.120, the Board may declare said Contractor to be a nonresponsive bidder for purposes of MCC Chapter 5.08. If the Board finds that a Contractor to whom a Contract for a Public Work of Improvement has been awarded has failed to comply with the good faith employment provisions of MCC Section 5.08.120 during the performance of the Contract, the Board may disqualify Contractor from bidding on any County Contract for a Public Work of Improvement for a period of one (1) year from the date of the Board's disqualification. A subsequent violation of MCC Section 5.08.120 by a Contractor may result in disqualification by the Board for a period of three (3) years from the date of the subsequent disqualification.

"Resident of Monterey Bay Area" means a person who resides within the boundaries of Monterey County, Santa Cruz County, or San Benito County.

A "good faith effort" means Contractor will take the following or similar actions to recruit and maintain Monterey Bay Area residents as part of the construction work force:

- Contact local recruitment sources, including local hiring halls, to identify qualified individuals who are Monterey Bay Area residents;
- Advertise for qualified Monterey Bay Area residents in trade papers, electronic/″on-line″ sources, and newspapers of general circulation in the Monterey Bay Area, unless time limits imposed by County do not permit such advertising;
- If portions of the work are to be performed by Subcontractors, identify qualified Subcontractors whose work force includes Monterey Bay Area residents; and
- If current work force does not exceed the fifty percent (50%) local employment requirement, develop a written plan to recruit Monterey Bay Area residents as part of the construction work force.

Contractor shall keep an accurate record on a standardized form showing the name, place of residence trade classifications, hours worked, proof of journeyperson or apprenticeship status, per diem wages and benefits of each person employed by Contractor, Contractor's Subcontractors on the Project, including full-time, part-time, permanent, and temporary employees, and make sure records are available to County with submission of final certified payroll records prior to final payment.

Contractor shall keep, and provide to County, on standardized forms acceptable to County, an accurate record documenting compliance with this provision. Said records shall include a listing by name and business address of all local recruitment sources contacted by the Contractor, the date of the local recruitment contact and the identity and business address of the person contacted, the trade and classification and number of hire referrals requested, the number of local hires employed as a result of the Contract, and the residence address of the person(s) employed pursuant to the contact.

At the conclusion of the Project, and at other intervals as may be deemed appropriate by Construction Manager, Contractor shall provide a summary report of the percentage of actual labor work hours performed by Monterey Bay Area residents on the Project.

Contractors and Subcontractors are referred to the provisions of MCC Section 5.08.120 and the rules, regulations, and procedures adopted to implement MCC Section 5.08.120, which are online at http://library.municode.com/index.aspx?clientId=16111 and incorporated by this reference.

17. Bidders Interested in More Than One Bid

No person, firm, or corporation shall be allowed to make, or file, or be interested in more than one (1) bid for the same work unless alternate bids are specifically called for. A person, firm, or corporation that has submitted a sub-proposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders or making a prime proposal.

18. Withdrawal of Bids

Any bidder may withdraw their bid either personally, by submitting a written request or telefaxed request to the County, at any time prior to the scheduled closing time for receipt of bids.

19. Determination of Apparent Low Bidder

County will open each Bidder's Envelope at the time and place indicated in the Notice to Bid, initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein.

Apparent Low Bidder will be determined from the total amount of the Base Bid and all Bid alternates. All Bidders are required to submit Bids on all Bid items.

If Apparent Low Bidder is determined to be nonresponsive or non-responsible, then County may proceed to the next Apparent Low Bidder's Bid pursuant to any procedures determined in its reasonable discretion, and proceed for all purposes as if this Apparent Low Bidder were the original Apparent Low Bidder.

20. Evaluation of Bids

County may conduct reasonable investigations and reference checks of Bidders and other persons and organizations as County deems necessary to assist in the evaluation of any Bid and to establish Bidder's responsibility, qualifications, financial ability and ability to perform the Work in accordance with the Contract Documents to County's satisfaction within the prescribed time. Submission of a Bid constitutes Bidder's consent to the foregoing:

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County shall have the right to consider information provided by sources other than Bidder. County shall also have the right to communicate directly with Bidder's Surety regarding Bidder's bonds.

Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.

Bids shall be deemed to include the written responses of the Bidder to any questions or requests for information of County made as part of Bid evaluation process after submission of Bid.

21. Evidence of Responsibility

Upon request of County, a bidder whose bid is under consideration for the award of the Contract shall submit promptly to County satisfactory evidence showing the bidder's financial resources, construction experience, and organization available for the performance of the Contract, and upon written request, shall furnish County a complete copy of its estimate and all appropriate backup information and supporting documents. County may utilize this information as a basis for determining that a Contractor is not responsible and, therefore, award the Contract to the next lowest responsible and responsive bidder.

22. Reservation of Rights

County reserves the right to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder as nonresponsive as a result of any error or omission in the Bid, or if County believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by County. For purposes of this Section, an "unbalanced Bid" is one having nominal prices for some Bid items and enhanced prices for other Bid items.

23. Award of Contract

County reserves the right to reject any or all bids, or to waive any irregularities or informalities in any bids or in the bidding. The award of the Contract, if made by County, will be to the lowest responsible and responsive bidder. The lowest bidder for the Project will be determined from the total amount of the Base Bid and all Bid alternates.

24. Documents required upon receipt of Notice of Conditional Award letter

Within ten (10) days after the bidder receives the Notice of Conditional Award letter, the successful bidder shall, in conformity with the Contract Documents, submit the following documents, including the number of originals required in the Supplementary Conditions:

- Executed Agreement (Division 005000);
- A Performance Bond and a Payment Bond, each in an amount equal to one hundred percent of the Contract Sum, issued and executed by an admitted surety insurer, authorized to transact surety insurance in California (Division 006000 and 006100);
- Insurance certificates showing that the successful bidder has obtained all required insurance coverage including endorsements;
- Printout showing active registration of Contractor and all Subcontractors with the Public Works Contractor Registration (online registration https://efiling.dir.ca.gov/PWCR/Search); and
- Such other documents as may be required by the Contract Documents.

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25. Bid Security Return

The bid security shall be returned to the bidders promptly after a decision is made whether to accept a bid or reject all bids, except that if a Contract award is to be made, the bid security of three or more of the lowest bidders (the number being at the discretion of County) will be held for sixty (60) days after notice of award is received by the successful bidder or until the successful bidder returns the executed Agreement and posts the required bonds and certificates of insurance, whichever occurs first. If the successful bidder returns the required documents on time, all the remaining bid security will be returned.

26. Bid Protests

Who can file a protest?

Only Bidders who the County otherwise determines are responsive and responsible are eligible to protest a Bid; protests from any other Bidder will not be considered. In order to determine whether a protesting Bidder is responsive and responsible, County may evaluate all information contained in any protesting Bidder's Bid, and conduct the same investigation and evaluation as County is entitled to take regarding an Apparent Low Bidder.

Requirements for Filing a Protest

Bidders who wish to lodge a protest as to the award of the bid must do so before 5 p.m. of the fifth business day following the issuance of the Notice of Intent to Award letter. Failure to timely file a written protest shall constitute a waiver of right to protest. Untimely protests will not be accepted or considered. Bid protests must be submitted, in writing, to: MONTEREY COUNTY PWFP TO THE ATTENTION OF FLORENCE KABWASA-GREEN, PROJECT MANAGER, 1441 SCHILLING PLACE SOUTH, SECOND FLOOR, SALINAS, CALIFORNIA 93901. Protests may be hand-delivered or sent via facsimile [(831)755-4958], certified United States Postal Service (U.S.P.S.) mail, or E-mailed to the attention of Project Manager at kabwasa-greenfa@co.monterey.ca.us. Bid protests must include the Project name and Bid number; a complete statement describing the basis for the bid protest, including a detailed statement of all legal and factual grounds for the protest; any documentation supporting the protestor's grounds for the protest; and the form of relief requested and legal basis for such relief. The party lodging the protest must also include their contact information including mailing address, telephone number, and E-mail address.

If a valid protest is timely filed, PWFP shall investigate the bid protest. The protested party shall have three (3) business days to respond to any requests to provide additional information from PWFP.

The procedure and time limits set forth in this Section are mandatory and are Bidder's sole and exclusive remedy in the event of Bid protest. Bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest.

County Response to Protests Received

PWFP shall respond to the protesting party, in writing, stating its findings. The PWFP Deputy Director of Public Works, Facilities & Parks shall submit a summary of bid protests received and make a recommendation to the Board of Supervisors regarding the bid protest(s).

27. Award and Execution of Contract

Notice of Award and Submittal of Executed Contract Documents

If Contract is to be awarded, it will be awarded to the lowest responsible responsive Bidder. County

will issue Notice of Conditional Award. Such Award, if made, will be made within sixty (60) days after the opening of the Bid Proposals.

Failure to Execute and Deliver Documents
If Bidder to whom Contract is awarded, within the period described in this Division 002000, fails or neglects to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, County may, in its sole discretion, rescind the award, recover on Bidder's Surety Bond, or deposit Bidder's cashier's check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder's failure to enter into the Contract Documents. Bidder agrees that calculating the damages County may suffer as a result of Bidder's failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder's required Bid security shall be the agreed and presumed amount of County's damages.

Upon such failure to timely deliver all required Contract Documents as set forth herein, County may determine the next Apparent Low Bidder and proceed accordingly. Such Award, if made, will be made within ninety (90) days after the opening of the Bid Proposals.

28. General Conditions and Other Requirements
Modification of Commencement of Work
County expressly reserves the right to modify the date for the Commencement of Work under the Contract and to independently perform and complete work related to Project. County accepts no responsibility to Contractor for any delays attributed to its need to complete independent work at the Site.

County shall have the right to communicate directly with Apparent Low Bidder's proposed Performance Bond Surety, to confirm the Performance Bond.

Conformed Project Manual
Following Award of Contract, County may prepare a conformed Project Manual reflecting Addenda issued during bidding, which will, failing objection, constitute the approved Project Manual.

COVID -19
Under the Monterey County Shelter in Place Order first issued on March 17, 2020, construction is identified as an essential business. Construction activity is permitted to continue in accordance with the local Monterey County Shelter in Place Order and the California Department of Public Health and the State of California Department of Industrial Relations Occupational Safety and Health Administration (CAL-OSHA) Industry Guidance for Construction issued on July 2, 2020.

Please be advised that ***all contractors*** selected to provide essential services and any persons/entities authorized by said contractor to visit County of Monterey work sites must comply with required COVID-19 health and safety measures including implementation of a COVID-19 prevention plan. Key business practices shall include physical distancing to the maximum extent possible, use of face coverings, frequent handwashing and regular cleaning and disinfecting, and training employees on these and other elements of their COVID-19 prevention plan. Prospective bidders are advised to review the Monterey County COVID-19 web site for more information on required COVID-19 health and safety measures: https://www.co.monterey.ca.us/government/departments-a-h/health/diseases/2019-novel-coronavirus-2019-ncov/health-officer-shelter-in-place-order

Failure to meet any or all of the above criteria may be cause for rejection of the bid.

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BID FORM
Division 003000

MONTEREY COUNTY BOARD OF SUPERVISORS

MAILING ADDRESS		PO BOX 1728, SALINAS, CALIFORNIA 93902
PHYSICAL ADDRESS		168 W ALISAL STREET, FIRST FLOOR, SALINAS, CALIFORNIA 93901

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER

PROJECT NO. 1701 BID NO. 10817

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

_____

TELEPHONE NUMBER: _____

PLACE OF RESIDENCE: _____

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BID FORM

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER

PROJECT NO. 1701 BID NO. 10817

TO: MONTEREY COUNTY BOARD OF SUPERVISORS

1. Pursuant to and in compliance with your Notice to Bidders inviting formal bids and with the other documents relating thereto, the undersigned bidder, having become familiar with the terms of the Contract, the local conditions affecting the performance of the Contract, the cost of the work at the place where the work is to be done, the Project Plans and Specifications, and the other Contract Documents, hereby proposes and agrees to perform within the time stipulated and to provide and furnish any and all labor, materials, equipment, transportation, utilities, and services necessary to perform the Contract and complete in a workmanlike manner all of the work required in connection with the above Project**,** all in strict conformity with the Drawings and Specifications and other Contract Documents, including Addenda nos. ___, ___, ___, ___, and ___, for the sum hereinafter stated (in the event of a discrepancy between the words and figures, the amount in words will govern):

2. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the County of Monterey ("County") in the form included in the Contract Documents, Division 005000 (Agreement), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.

3. Bidder accepts all of the terms and conditions of the Contract Documents, Appendices, and Instructions to Bidders, including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for sixty (60**) Days after the day of Bid opening.**

4. Bidder has visited the Site and performed all tasks, research, investigation, reviews, examinations, and analysis and given notices, regarding the Project and the Site.

5. Bidder has given the County prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents, Appendices, and as-built Drawings and actual conditions and the written resolution thereof through Addenda issued by the County is acceptable to Contractor.

6. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sums of money listed in the following Schedule of Bid Prices:

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BASE BID: ALL WORK AS NOTED IN DRAWINGS AND SPECIFICATIONS INCLUDING SITE WORK, DEMOLITION AS REQUIRED, CONSTRUCTION OF NEW TWO-STORY COMMERCIAL BEHAVIORAL/ OFFICE BUILDING FOR MONTEREY COUNTY HEALTH DEPARTMENT, CLINIC SERVICES. MAXIMUM BUILDING HEIGHT = 38'-0". EXTERIOR MATERIALS SYSTEM: STUCCO WITH FIBER CEMENT SIDING AND LOW-SLOPE MEMBRANE ROOF SYSTEM WITH PARAPETS., EXCEPT FURNITURE FIXTURES & EQUIPMENT NAMED IN CONTRACT DOCUMENTS.

_____Dollars

$_____

ALTERNATE BID #1: STATE THE AMOUNT TO BE ADDED TO THE BASE BID TO
Provide the cost for adding and automatic transfer switch and infrastructure to hook up a mobile generator as described in the drawings and specifications**.**
☒ ADD TO THE BASE BID ~~OR DEDUCT FROM BASE BID~~

_____Dollars

$ _____

ALTERNATE BID #2: STATE THE AMOUNT TO BE ADDED TO THE BASE BID TO
Provide the cost for additional acoustical scope as described in the drawings and specifications.
☒ ADD TO THE BASE BID ~~OR DEDUCT FROM BASE BID~~

_____Dollars

$ _____

ALTERNATE BID #3: STATE THE AMOUNT TO BE ADDED TO THE BASE BID TO
Provide the cost for the design/build PV solar system on the roof as described in the drawings and specifications.
☒ ADD TO THE BASE BID ~~OR DEDUCT FROM BASE BID~~

_____Dollars

$ _____

ALTERNATE BID #4: STATE THE AMOUNT TO BE ADDED TO THE BASE BID TO
Provide the cost to install the electric vehicle charging stations as described in the drawings and specifications.
☒ ADD TO THE BASE BID ~~OR DEDUCT FROM BASE BID~~

_____Dollars

$ _____

ALTERNATE BID #5: STATE THE AMOUNT TO BE ADDED TO THE BASE BID TO
Provide the cost savings to change the specification for the building windows (not including curtain wall) as described in the drawings and specifications.
☒ ~~ADD TO THE BASE BID OR~~ DEDUCT FROM BASE BID

_____Dollars

$----------

TABLE OF UNIT COSTS

Item	*Description*	*Unit*	*Cost/unit*
1.	**Unit price per ton** for class 2AB, delivered, spread, and compacted.		
2.	**Unit price per ton** for off haul of existing soil (non-hazardous) to meet required compaction.		
3.	**Unit price per lineal foot** for 12" continuous wall backing.		

7. Determination of lowest responsible bidder – In accordance with Public Contract Code Section 20103.8(a). determination of lowest bidder will be based upon the total amount of the Base Bid and all Bid alternates. The Contract will then be awarded to the Bidder submitting the lowest amount, if it is awarded. Unit pricing provided by the bidder, if any, shall be incorporated in the Agreement, and shall be the basis for calculating any costs involving changes to the work.

8. The undersigned has checked all above figures carefully and understands that County will not be responsible for any errors and omissions on the part of the undersigned in making this bid.

9. It is understood that County reserves the right to reject any and all bids or waive any informalities or irregularities in any bids or in the bidding.

10. This bid shall remain valid and will not be withdrawn by the undersigned bidder for a period of sixty (60) days from the date prescribed for opening of this bid without the written consent of County.

11. Attached hereto are the following:
   a) List of Subcontractors;
   b) Non-Collusion Declaration;
   c) Workers' Compensation Certificate;
   d) Iran Contracting Act Certification;
   e) Contractor's Certification of Good-Faith Effort to Employ Monterey Bay Area Residents;
   f) Written Plan to Recruit Monterey Bay Area Residents, when applicable;
   g) Required bidder's security in an amount not less than ten percent (10%) of the base bid amount;
   h) Bidder Certifications; and

i) Acknowledgment of Addenda, if any.

12. If this bid is accepted by County, then the undersigned shall, within ten (10) days after receipt of the Notice of Conditional Award letter, execute and deliver to County (a) a Contract in the form set forth in the Contract Documents on which this bid is based, (b) a Payment Bond for Public Works, as required by the Contract Documents, (c) a Performance Bond, as similarly required, (d) an Insurance Certificate, as similarly required and (e) printout showing active registration of Contractor and all Subcontractors with the Public Works Contractor Registration (online registration https://efiling.dir.ca.gov/PWCR/Search). The undersigned will thereafter commence and complete the Work within the time required by the Contract Documents.

13. The undersigned Bidder agrees to commence Work under the Contract Documents on the date established in Division 007100 (General Conditions) and to complete all Work within the time specified in Division 005000 (Agreement). The undersigned Bidder acknowledges that the County has reserved the right to delay or modify the commencement date. The undersigned Bidder further acknowledges County has reserved the right to perform independent Work at the Site, the extent of such Work may not be determined until after the opening of the Bids, and that the undersigned Bidder will be required to cooperate with such other Work in accordance with the requirements of the Contract Documents.

14. The undersigned Bidder agrees that, in accordance with Division 007100 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified in Division 005000 (Agreement) shall be as set forth in Division 005000 (Agreement) and Division 002000 (Instructions to Bidders).

15. Notice of acceptance and any requests for additional information shall be addressed to the undersigned at the following address:

COUNTY OF MONTEREY OR VIA FACSIMILE: (831)755-4958
PWFP- PUBLIC WORKS, FACILITIES & PARKS
FLORENCE KABWASA-GREEN, PROJECT MANAGER
1441 SCHILLING PLACE SOUTH, SECOND FLOOR
SALINAS, CALIFORNIA 93901

16. The names of all persons interested in the foregoing proposal as principals are as follows:

Name	Title
Name	Title
Name	Title

(**IMPORTANT NOTICE**: If the bidder or other interested person is a corporation, state the legal name of the corporation, and the names of the president, vice president, secretary, assistant secretary, treasurer, assistant treasurer, and chief financial officer thereof; if a limited liability corporation (LLC), state the legal name of the LLC and the names of two (2) managers thereof; if a partnership, state the

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name of the firm and the names of all the individual partners composing the firm; if the bidder or other interested person is an individual, state the first and last names in full and give all fictitious names under which the individual does business.)

17. By execution of this bid, the undersigned bidder declares that he or she is a contractor licensed in accordance with the Contractors' State License Law, as follows:

Classification: _____

License number: _____

Expiration date: _____

18. In the event the bidder to whom Notice of Intent to Award letter is given fails or refuses to post the required bonds and insurance and return the executed copies of the agreement form within ten (10) days from the date of receiving the Notice of Intent to Award letter, County may declare the bidder's security forfeited as damages and contract with the second lowest bidder.

19. Pursuant to section 7103.5(b) of the Public Contract Code, in submitting a bid to County, the bidder offers and agrees that if the bid is accepted, it will assign to County all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 [commencing with section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

Dated _____

Bidder's Business Name _____

By _____

Principal Signature _____

Principal Name (Print) _____

Principal Title (Print) _____

By _____

Principal Signature _____

Principal Name (Print) _____

Principal Title (Print) _____

(Corporate Seal)

NOTE: ***If bidder is a corporation, the full legal name of the corporation shall be set forth above together with the signatures of two (2) authorized officers per California Corporations Code Section 313 and the document shall bear the corporate seal; if bidder is a Limited Liability Company (LLC), the full legal name of the LLC shall be set forth above together with the signatures of two (2) managers; if bidder is a partnership, the full name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his/her signature shall be placed above.***

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LIST OF SUBCONTRACTORS

Division 003500

In compliance with the Subletting and Subcontracting Fair Practices Act (Chapter 4 [commencing with section 4100], Part 1, Division 2 of the Public Contract Code) and any amendments thereto, each bidder shall set forth below: (a) the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement to be performed under this contract or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications in an amount in excess of one-half of one percent of the prime contractor's total bid, and (b) the portion of the work which will be done by each subcontractor under this Act. The prime contractor shall list only one subcontractor for each such portion as is defined by the prime contractor in this bid. The term "portion of work" refers to the type of work. The prime contractor has up to 24 hours from the time of the bid opening to submit a revised listing to correct any inadvertent error in the required subcontractor license information.

If a prime contractor fails to specify a subcontractor or if a prime contractor specifies more than one subcontractor for the same portion of the work to be performed under the contract in excess of one-half of one percent of the prime contractor's total bid, he/she/it shall be deemed to have agreed that he/she/it is fully qualified to perform that portion himself/herself/itself, and that he/she/it shall perform that portion himself/herself/itself.

No prime contractor whose bid is accepted shall: (a) substitute any subcontractor, (b) permit any subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid, or (c) sublet or subcontract any portion of the work in excess of one-half of one percent of the prime contractor's total bid as to which his/her/its original bid did not designate a subcontractor, except as authorized in the Subletting and Subcontracting Fair Practices Act. Subletting or subcontracting of any portion of the work in excess of one-half of one percent of the prime contractor's total bid as to which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the authority awarding this contract setting forth the facts constituting the emergency or necessity.

Bidder's Business Name: _____

By: _____

Print Name: _____

Print Title: _____

Date: _____

☐ **Check this box if no subcontractors are required to be listed for work or labor to be performed or services to be rendered. Otherwise provide all requested information below. Assembly Bill No. 44 requires name/location of business/CALIFORNIA contractor's license of all subcontractors**

Portion (Type) of Work	Subcontractor Name/ License Number & Expiration Date	Subcontractor's Location of Place of Business

(This form may be duplicated as necessary)

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NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Public Contract Code Section 7106)
Division 004000

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 or its 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: _____

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CONTRACTOR'S CERTIFICATE AS TO WORKERS' COMPENSATION

(Labor Code Section 1861)
Division 004100

Labor Code Section 3700 provides, in relevant part:

> "Every employer except the state shall secure the payment of compensation in one or more of the following ways:
>
> (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.
>
> (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, either as an individual employer, or as one employer in a group of employers, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees."

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

Dated: _____

Bidder's Business Name: _____

By: _____

Print Name: _____

Print Title: _____

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Section 2204)

DIVISION 004200

Pursuant to Public Contract Code (PCC) Section 2204, an Iran Contracting Act certification is required for solicitations of goods or services of $1,000,000 or more.

You must complete one of the following two paragraphs with your bid submittal. To complete paragraph 1, check the corresponding box and complete the certification for paragraph 1. To complete paragraph 2, check the corresponding box and attach a copy of the written permission from the County with your bid.

☐ 1. We are not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to PCC 2203(b), and we are not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

CERTIFICATION FOR PARAGRAPH 1:

I, the official named below, certify under penalty of perjury, that I am duly authorized to legally bind the proposer/bidder to the clause in paragraph 1. This certification is made under the laws of the State of California.

Company Name (Printed)	*Federal ID Number*
By (Authorized Signature)	
Printed Name and Title of Person Signing	
Date Executed	*Executed in the County of _____ in the State of _____*

OR

☐ 2. We have received written permission from the County to submit a bid or proposal pursuant to PCC 2203(c) or (d). A copy of the written permission from the County is attached hereto.

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CONTRACTOR'S CERTIFICATION OF GOOD-FAITH EFFORT TO EMPLOY MONTEREY BAY AREA RESIDENTS

(Monterey County Code Section 5.08.120)
Division 004300

I CERTIFY THAT I am aware of the provision of Monterey County Code Section 5.08.120.

Monterey County Code Section 5.08.120 provides, in relevant part:

A. General Provisions. All County contracts for public works of improvement shall contain provisions pursuant to which the contractor shall make a good-faith effort to employ qualified individuals who are, and have been for at least one (1) year out of the past three (3) years prior to the opening of bids, residents of the Monterey Bay Area in sufficient numbers so that no less than fifty percent (50%) of the contractors total construction work force, on that particular contract, including any subcontractor work force (with exception of specialty subcontractor items identified in bid items) measured in labor work hours, is comprised of Monterey Bay Area residents.

B. Non-responsive Bidder Declaration: Enforcement. If any contractor submitting a bid for a contract for public works of improvement fails to abide by the good-faith local employment provisions of this Section, Contractor may be declared by the Board to be a non-responsive bidder for purposes of this Chapter. If a contractor lists in his or her bid a subcontractor who is currently disqualified under the terms of this Section, the Board may declare said contractor to be a non-responsive bidder for purposes of this Chapter. If the Board finds that a contractor to whom a contract for public works of improvement has been awarded has failed to comply with the good-faith employment provisions of this Section during the performance of the contract, the Board may disqualify Contractor from bidding on any County contract for public works of improvement for a period of one (1) year from the date of the Board's disqualification. A subsequent violation of this Section by a contractor may result in disqualification by the Board for a period of three (3) years from the date of the subsequent disqualification.

C. Binding on Subcontractors. Every contractor entering into a contract for public works of improvement subject to the provisions of this Section shall include in each and every subcontract for work, laborers, or material supplier relating to the project the requirement that the subcontractor shall make a good-faith effort to employ qualified individuals who are, and have been for at least one (1) year out of the past three (3) years prior to the opening of bids, residents of the Monterey Bay Area. If the Board finds that any subcontractor has failed during the performance of the subcontract to comply with this Section, the Board may disqualify said subcontractor from submitting or being listed in any bid for any County contract for public works of improvement for a period of one (1) year from the date of the Board's disqualification. A subsequent violation by a subcontractor may result in disqualification by the Board for a period of three (3) years from the date of the subsequent disqualification."

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I FURTHER CERTIFY AS FOLLOWS (check the box that applies):

☐ I CERTIFY that at least fifty percent (50%) of the total construction work force on the project, including any subcontractor work force, measured in labor work hours, will be comprised of qualified individuals who to the best of my knowledge are, and have been for at least one (1) year out of the past three (3) years prior to the effective date of the opening of bids, residents of the Monterey Bay Area. Evidence that I will comply with this requirement is as follows (please use additional pages to provide supporting evidence and/or documentation, as necessary):

_____

_____

_____

☐ I CERTIFY that I shall make a good-faith effort to employ qualified individuals who, to the best of my knowledge, are, and have been for at least one (1) year out of the past three (3) years prior to the effective date of the opening of bids, residents of the Monterey Bay Area in sufficient numbers such that no less than fifty percent (50%) of the total construction work force on the project, including any subcontractor work force (with the exception of specialty subcontractor items identified in the bid items) measured in labor work hours, will be comprised of Monterey Bay Area residents. **Attached is my written plan to recruit Monterey Bay Area residents as part of the construction work force**.

☐ I CERTIFY that I do not comply with and am unable to make a good-faith effort to comply with the good-faith local employment provisions set forth in Monterey County Code Section 5.08.120. Explanation to why I am not able to comply is as follows (please use additional pages to provide supporting evidence and/or documentation, as necessary):

_____

_____

_____

I declare under penalty of perjury under the laws of the State of California that the foregoing certification is true and correct. Executed on (date) _____
at (city/state) _____.

Bidder's Business Name: _____

By: _____

Print Name: _____

Print Title: _____

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BID BOND

Division 004400

(Public Contract Code Section 20129)

WHEREAS the Principal has submitted the accompanying bid dated _____, to the County of Monterey, for the following project: **331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER**, **PROJECT NO. 1701, BID NO. 10817 ,** and

WHEREAS, Principal, as bidder, is required to furnish a bond executed by an admitted surety in connection with said bid, to secure the timely execution of the contract and delivery of bonds and insurance certificates, in the event that the contract is awarded to the Principal.

NOW, THEREFORE, we _____ as Principal, and _____

_____

_____ as Surety, are held and firmly bound unto the County of Monterey, a political subdivision of the State of California (hereinafter called "County"), in the penal sum of _____Dollars ($_____.__), which sum is not less than ten percent (10%) of the base bid amount including all alternates of the Principal submitted to the said County for the above-described project, 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, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

If the Principal is awarded the contract and, within the time and manner required under the contract documents for the above-described project, after the prescribed forms are presented to him/her for signature, (1) enters into a written contract in the prescribed form, in accordance with the bid, (2) files such insurance certificates with the County as may be required by said contract documents, and (3) files a performance bond and a payment bond with the County, in conformity with said contract documents, then this obligation shall be null and void; otherwise, it shall remain in full force.

Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract on the call for bids, or to the work to be performed there under, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said contract or the call for bids, or to the work, or to the specifications.

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If County brings suit upon this bond and judgment is recovered, the Surety shall pay all litigation expenses incurred by County in such suit, including attorneys' fees, court costs, expert witness fees and investigation expenses.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Corporate Seal)

_____
Principal

By: _____

Title: _____

(Corporate Seal)

_____
Surety

By: _____

Title: _____

Attach: 1) A Copy of authorization for signature for Principal, and 2) An original or certified copy of unrevoked appointment, Power of Attorney, Attorney-in-Fact Certificate bylaws or other instrument entitling or authorizing person executing bond on behalf of Surety to do so.

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BIDDER CERTIFICATIONS
Division 004516

TO BE EXECUTED BY BIDDERS AND SUBMITTED WITH PROPOSAL

The undersigned Bidder certifies to Owner as set forth in Sections 1 through 6 below.

Certification Of Worker's Compensation Insurance

By my signature hereunder, as the Bidder, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the Work of this Contract.

Certifications Of Prevailing Wage Rates, Records, And Apprentices

By my signature hereunder, as the Bidder, I certify that I am aware of the provisions of Section 1773 of the California Labor Code, which requires the payment of prevailing wage on public Projects. Also, that Bidder and any Subcontractors shall comply with California Labor Code Section 1776, regarding wage records, and with California Labor Code Section 1777.5, regarding the employment and training of apprentices. It is Bidder's responsibility to ensure compliance by any and all Subcontractors performing Work under this Contract. I further certify that I am aware that this Project is subject to the requirements of Division 2, Part 7, Chapter 1 of the Labor Code (Public Works), and the requirements of Title 8. Division 1, Chapter 8. Subchapter 4.5 of California Code of Regulations (Compliance Monitoring and Enforcement by Department of Industrial Relations), including the obligation to furnish certified payroll records directly to the Labor Commissioner in accordance with 8 CCR 16461.

Certification Of Compliance With Public Works Chapter Of Labor Code

By my signature hereunder, as the Bidder, I certify that I am aware of Sections 1777.1 and 1777.7 of the California Labor Code and Bidder and Subcontractors are eligible to bid and work on Public Works Projects.

Certification Of Adequacy Of Contract Amount

By my signature hereunder, as the Bidder, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned's Bid, the Contract will include funds sufficient to allow the Bidder to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that Owner will be relying on this certification if it awards the Contract to the undersigned.

Certification of Acceptability of Contract Documents

By my signature hereunder, as the Bidder, I certify that Bidder acknowledges that Owner has already transmitted the Contract Documents in draft form to state officials and has obtained prior state approval of the acceptability of the Contract Documents. Accordingly, Bidder has carefully reviewed the Contract Documents and certifies as follows:

If the undersigned is selected to be awarded the Contract, following issuance of Notice of Conditional Award to the undersigned, the undersigned will sign the Agreement form and provide the other required forms that have been included within the Contract Documents in the same form as drafted as of the date hereof, including all Addenda identified in the undersigned's Bid and with applicable information from the undersigned's Bid inserted, without seeking revisions to the Agreement form or any other Contract Document.

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Certification Of Acceptable Safety Record

[Please check and/or complete one of the following]

_____By my signature hereunder, as the Bidder, I certify that the Bidder's experience modification rate for the most recent three-year period is an average of 1.00 or less, and its average Total Recordable Injury/Illness rate and average lost work rate for the most recent three-year period does not exceed the applicable statistical standards for its business category or the Bidder is a party to an alternative dispute resolution system as provided for in Section 3201.5 of the Labor Code.

_____By my signature hereunder, as the Bidder, except as provided in Appendix _____, consisting of _____ pages, attached hereto, I certify that the Bidder's experience modification rate for the most recent three year period is an average of 1.00 or less, and its average Total Recordable Injury/Illness rate and average lost work rate for the most recent three year period does not exceed the applicable statistical standards for its business category or the Bidder is a party to an alternative dispute resolution system as provided for in Section 3201.5 of the Labor Code . Bidder must attach an Appendix, identifying and explaining all exceptions to this certification, if this item is checked.

BIDDER: _____
(Name of Bidder)

Date: _____ By: _____
(Signature)

Name: _____
(Print Name)

Its: _____
(Title)

END OF DIVISION

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Sample

AGREEMENT

Division 005000

THIS AGREEMENT, hereinafter called "Agreement" (sometimes referred to as "CONTRACT" or "contract"), is made by and between the COUNTY OF MONTEREY, a political subdivision of the State of California, hereinafter called "COUNTY," and _____ *(Name of Contractor)*, hereinafter called "CONTRACTOR." For reference purposes, the date of this Agreement is the date it is executed by the Public Works Facilities and Parks Director.

THE COUNTY AND CONTRACTOR hereby agree as follows:

ARTICLE 1 SCOPE OF WORK

CONTRACTOR shall, within the time stipulated, perform the contract as herein defined and shall furnish all work, labor, equipment, transportation, material, and services to construct and complete in a good, expeditious, workmanlike, and substantial manner, the Project:
331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER, PROJECT NO. 1701, BID NO. 10817 .

All work shall be completed in strict conformance with the plans, specifications, and working details prepared by THE PAUL DAVIS PARTNERSHIP ARCHITECTS, and the provisions of the documents listed in Article 6 below, and to the satisfaction of COUNTY.

ARTICLE 2 TIME FOR START AND FINAL COMPLETION

CONTRACTOR shall commence the work on the starting date established in the Notice to Proceed. The CONTRACTOR shall achieve Final Completion of the entire Work no later than Three Hundred Thirty (330) days from the date of commencement. Additionally, CONTRACTOR shall coordinate their work with all other contractors whose work is affected by the scope of work defined in this Agreement. CONTRACTOR expressly agrees to provide appropriate labor, hours, rates, materials, and equipment in response to adjustments in the Project Schedule made by the Monterey County PWFP Deputy Director of Public Works, Facilities & Parks or his/her designee during the course of the project in order to maintain the required progress.

ARTICLE 3 CONTRACT PRICE

County shall pay CONTRACTOR as full consideration for the performance of the contract, subject to any additions or deductions as provided in the contract documents referenced in ARTICLE 6 COMPONENT PARTS OF THIS CONTRACT below, the Stipulated Sum of *(written amount):*

_____,

numerical $ amount): $ _____.

The Stipulated Sum is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by County:

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(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the County to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires)

ADDITIVE ALTERNATES #-, #-, #-,#-,#-.

Unit prices, if any: NOT APPLICABLE

(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable)

Item	Units and Limitations	Price per Unit ($0.00)

Allowances included in the Stipulated Sum, if any:

(Identify allowances and state exclusions, if any, from the allowance price)

Item	Allowance

Allowance Work will be authorized by COUNTY in writing, following Change Order procedures to determine cost, supporting documentation and authorization to proceed. Unused allowance amounts at Contract completion shall reduce the Contract Sum accordingly.

ARTICLE 4 LIQUIDATED DAMAGES

THE PARTIES AGREE THAT IN CASE ALL THE WORK CALLED FOR UNDER THE CONTRACT IN ALL PARTS AND REQUIREMENTS IS NOT COMPLETED WITHIN THE TIME SPECIFIED IN THE CONTRACT DOCUMENTS, DAMAGE WILL BE SUSTAINED BY COUNTY, AND THAT IT IS AND WILL BE IMPRACTICABLE AND EXTREMELY DIFFICULT TO DETERMINE THE ACTUAL DAMAGE WHICH COUNTY WILL THEREBY SUSTAIN. THE PARTIES THEREFORE AGREE THAT CONTRACTOR WILL PAY TO COUNTY THE SUM SET FORTH IN THE SUPPLEMENTARY CONDITIONS, IF ANY, FOR EACH CALENDAR DAY OF DELAY UNTIL THE WORK IS COMPLETED AND ACCEPTED. CONTRACTOR AND HIS/HER/ITS SURETY SHALL BE LIABLE FOR THE TOTAL AMOUNT THEREOF. CONTRACTOR AGREES TO PAY SAID LIQUIDATED DAMAGES ESTABLISHED HEREIN, AND FURTHER AGREES THAT COUNTY MAY DEDUCT THE AMOUNT THEREOF FROM ANY MONIES DUE OR THAT MAY BECOME DUE CONTRACTOR UNDER THE CONTRACT.

ARTICLE 5 NOTIFICATION OF THIRD-PARTY CLAIMS

COUNTY shall notify CONTRACTOR of the receipt of any third-party claim relating to the contract and is entitled to recover its reasonable costs incurred in providing the notification as provided in Public Contract Code Section 9201.

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ARTICLE 6 COMPONENT PARTS OF THIS CONTRACT

The contract entered into by this Agreement consists of the following documents, all of which are component parts of the contract as if herein set out in full or attached hereto:

- Notice to Bidders
- Instructions to Bidders
- Bid, as accepted
- List of Subcontractors
- Noncollusion Declaration
- Workers' Compensation Certificate
- Contractor's Certification of Good Faith Effort to Employ Monterey Bay Area Residents
- Written Plan to Recruit Monterey Bay Area Residents, when applicable
- Bid Bond or Bidder's Security
- Agreement
- Performance Bond
- Payment Bond
- Insurance Certificate
- Iran Contracting Act Certification
- Bidder Certifications
- Guaranty
- Division 007100 General Conditions, Bid No. 10817
- Division 007300 Supplementary Conditions, Bid No. 10817
- Specifications and Drawings as Prepared by THE PAUL DAVIS PARTNERSHIP ARCHITECTS *(refer to an exhibit attached to this Agreement that lists Section, Title, Date and Pages for Specifications; Number, Title and Date for Drawings.)*
- Appendices: None
  *As issue*d, Proje*ct Addenda Nos:*

All of the contract documents referenced above are intended to be complementary. Work required by one of the contract documents referenced above and not by others shall be done as if required by all.

IN WITNESS WHEREOF, the parties have duly executed four (4) identical counterparts of this instrument, each of which shall be for all purposes deemed an original thereof, on the dates set forth below.

ARTICLE 7 - NOTICES

All notices to CONTRACTOR and COUNTY (including requests, demands, approvals or other communications other than ordinary course Project communications) in connection with the Project shall be in writing and shall include the word "NOTICE" in the subject line and shall be directed as follows.

County of Monterey
Department of Public Works, Parks and Facilities
Attn: Florence Kabwasa-Green, Project Manager
1441 Schilling Place, Second Floor
Salinas, California 93901

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with a copy to:

Contractor

[Insert Contact Information]

A. Notice shall be sufficiently given for all purposes as follows:

1. When personally delivered to the recipient, notice is effective on delivery.
2. When mailed by certified mail with return receipt requested, notice is effective on receipt if delivery is confirmed by a return receipt.
3. When delivered by reputable delivery service, with charges prepaid or charged to the sender's account, notice is effective on delivery if delivery is confirmed by the delivery service.
4. Notice by facsimile or electronic mail shall not be allowed or constitute "Notice" under this Section.

B. Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified shall be considered to be effective as of the first date that the notice was refused, unclaimed, or considered undeliverable by the postal authorities, messenger, or overnight delivery service.

C. Either party may, by written notice given at any time or from time to time require subsequent notices to be given to another individual person, whether a party or an officer or a representative, or to a different address, by giving the other party notice of the change in any manner permitted by this Article.

D. The provisions of this Article shall not alter, modify or excuse any legal or contractual requirement relating to Claims under Division 007100 (General Conditions).

ARTICLE 8 – OTHER PROVISIONS

A. In order to induce COUNTY to enter into this Agreement, CONTRACTOR represents that it is duly organized, existing and in good standing under applicable state law; is licensed to perform all aspects of the Work; will employ only persons and Subcontractors and designers with all required licenses and certifications; that CONTRACTOR is duly qualified to conduct business in the State of California; that CONTRACTOR has duly authorized the execution, delivery and performance of this Agreement, the other Contract Documents and the Work to be performed herein; and that the Contract Documents do not violate or create a default under any instrument, Agreement, order or decree binding on CONTRACTOR.

B. CONTRACTOR shall not assign any portion of the Contract Documents.

C. Should any part, term or provision of this Agreement or any of the Contract Documents, or any document required herein or therein to be executed or delivered, be declared invalid, void or unenforceable, all remaining parts, terms and provisions shall remain in full force and effect and shall in no way be invalidated, impaired or affected thereby. If the provisions of any law causing such invalidity, illegality or unenforceability may be waived, they are hereby waived to the end that this Agreement and the Contract Documents may be deemed valid and binding Agreements, enforceable in accordance with their terms to the greatest extent permitted by applicable law. In the event any provision not otherwise included in the Contract Documents is required to be included by any

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applicable law, that provision is deemed included herein by this reference (or, if such provision is required to be included in any particular portion of the Contract Documents, that provision is deemed included in that portion).

D. It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of COUNTY or acting as an employee, agent, or representative of COUNTY, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of COUNTY is limited and confined to such liability as authorized or imposed by the Contract Documents or applicable law.

E. In entering into a Public Works Contract or a Subcontract to supply goods, services or materials pursuant to a Public Works Contract, CONTRACTOR or Subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the Public Works Contract or the Subcontract. This assignment shall be made and become effective at the time COUNTY tenders final payment to CONTRACTOR, without further acknowledgment by the parties.

F. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the Contract Documents and on file at COUNTY's PWFP – Public Works, Facilities & Parks Office, and shall be made available to any interested party on request. Pursuant to California Labor Code Sections 1860 and 1861, in accordance with the provisions of Section 3700 of the Labor Code, every CONTRACTOR will be required to secure the payment of compensation to his/her/its employees. CONTRACTOR represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and CONTRACTOR shall comply with such provisions before commencing the performance of the Work set forth in the Contract Documents.

G. COUNTY shall have the right to review all phases of CONTRACTOR's design of deferred submittals including, but not limited to, Drawings, Specifications, Shop Drawings, samples and submittals, as specified in the Contract Documents. Such review and other action shall not relieve CONTRACTOR of its responsibility for a complete design of deferred submittals complying with the requirements of the Contract Documents; but rather, such review shall be in furtherance of COUNTY's monitoring and accepting the design of deferred submittals as developed and issued by the CONTRACTOR, consistent with these Contract Documents. CONTRACTOR's responsibility to design deferred submittals and construct the Project in conformance with the Contract Documents shall be absolute.

H. This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Monterey, State of California, and governed in all respects by California law. The exclusive venue for all disputes or litigation hereunder shall be in the Superior Court for the County of Monterey.

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COUNTY OF MONTEREY

By: _____

Name: Randy Ishii, MS, PE, TE, PTOE

Title: Director, Public Works Facilities and Parks

Date: , 2021

APPROVED AS TO FORM

CONTRACTS/PURCHASING

By: _____

Name:

Title: Contracts/Purchasing Officer

Date: , 2021

APPROVED AS TO FORM & LEGALITY

OFFICE OF THE COUNTY COUNSEL-RISK MANAGEMENT, LESLIE J. GIRARD, County Counsel

By: _____

Name: Mary Grace Perry

Title: Deputy County Counsel

Date: , 2021

APPROVED AS TO FISCAL TERMS

COUNTY AUDITOR-CONTROLLER

By: _____

Name: Gary Giboney

Title: Chief Deputy Auditor-Controller

Date: , 2021

APPROVED AS TO INDEMNITY/INSURANCE LANGUAGE

COUNTY COUNSEL-RISK MANAGEMENT

By: _____

Name: Leslie J. Girard

Title: County Counsel

Date: , 2021

CONTRACTOR: NAME OF COMPANY

By: _____

Principal Name:

Title:

Date: , 2021

By: _____

Principal Name2:

Title:

Date: , 2021

COMPANY ADDRESS:

Contractor's License Type:

License Number:

License Expiration Date:

NOTE: CONTRACTORS ARE REQUIRED TO BE LICENSED AND REGULATED BY THE CONTRACTORS' STATE LICENSE BOARD. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO THE REGISTRAR, CONTRACTORS' STATE LICENSE BOARD, PO BOX 26000, SACRAMENTO, CALIFORNIA 95826

INSTRUCTIONS: If bidder is a corporation, the full legal name of the corporation shall be set forth above together with the signatures of authorized officers pursuant to California Corporations Code Section 313 and the document shall bear the corporate seal; if bidder is a limited liability corporation (LCC), the full legal name of the LLC shall be set forth above together with the signatures of two managers and the document shall bear the LLC corporate seal; if bidder is a partnership, the full name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his/her signature shall be placed above.

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PERFORMANCE BOND

(Public Contract Code Section 20129)
Division 006000

WHEREAS, the County of Monterey has awarded to Principal,

_____

as Contractor, for the following project:

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER, PROJECT NO. 1701, BID NO. 10817 ; and

WHEREAS, Principal, as Contractor, is required to furnish a bond in connection with said contract, to secure the faithful performance of said contract.

NOW, THEREFORE, we _____

as Principal, and _____

_____

as Surety, are held and firmly bound unto the County of Monterey, a political subdivision of the State of California (hereinafter called "County"), in the penal sum of

_____Dollars

($_____.00), 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, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

If the Principal, as Contractor, or Principal's heirs, executors, administrators, successors, or assigns, (1) shall in all things stand to and abide by and well and truly keep and perform the covenants, conditions, and agreements in said contract and any alteration thereof made as therein provided, on Principal's part to be kept and performed, at the time and in the manner therein specified and in all respects according to their true intent and meaning, and (2) shall indemnify, defend, and save harmless the County, the members of its board of supervisors, and its officers, agents, and employees as therein stipulated, then this obligation shall become null and void; otherwise, it shall be and remain in full force and virtue.

Surety hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said contract or the call for bids, or to the work, or to the specifications.

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Whenever the Principal, as Contractor, is in default, and is declared in default, under the Contract by the County of Monterey, the County of Monterey having performed its obligation under the contract, Surety may promptly remedy the default, or shall promptly:

1. Complete the contract in accordance with its terms or conditions, or
2. Obtain a bid or bids for submission to County of Monterey for completing the Contract in accordance with its terms or conditions, and upon determination by the County of Monterey and Surety of the lowest responsible and responsive bidder, arrange for a contract between such bidder and the County of Monterey, and make available as work progresses (even though there should be a default or succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price.

If suit is brought upon this bond by the County and judgment is recovered, the Surety shall pay all litigation expenses incurred by the County in such suit, including attorneys' fees, court costs, expert witness fees, and investigation expenses.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this ____ day of _____, 21 , the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Corporate Seal) _____
Principal

By: _____

Title: _____

(Corporate Seal) _____
Surety

By: _____

Title: _____

Attach: 1) Copy of authorization for signature for Principal, and 2) original or certified copy of unrevoked appointment, Power of Attorney, Attorney-in-Fact Certificate bylaws or other instrument entitling or authorizing person executing bond on behalf of Surety to do so.

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PAYMENT BOND

(Civil Code Section 9550)
Division 006100

WHEREAS, the County of Monterey has awarded to Principal,

_____

as Contractor, a contract for the following project:

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER, PROJECT NO. 1701, BID NO. 10817 ; and

WHEREAS, Principal, as Contractor, is required to furnish a bond in connection with said contract, to secure the payment of claims of laborers, mechanics, material suppliers, and other persons furnishing labor and materials on the project, as provided by law.

NOW, THEREFORE, we _____

as Principal, and _____

_____

as Surety, are held and firmly bound unto the County of Monterey, a political subdivision of the State of California (hereinafter called "County"), and to the persons named in California Civil Code section 9100 in the penal sum of_____Dollars ($_____.___), 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, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

If Principal or any of Principal's heirs, executors, administrators, successors, assigns, or subcontractors (1) fails to pay in full all of the persons named in Civil Code Section 9100 with respect to any labor or materials furnished by said persons on the project described above, or (2) fails to pay in full all amounts due under the California Unemployment Insurance Code with respect to work or labor performed under the contract on the project described above, or (3) fails to pay for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal and subcontractors pursuant to Unemployment Insurance Code section 13020 with respect to such work and labor, then the Surety shall pay for the same.

Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract on the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said contract or the call for bids, or to the work, or to the specifications.

If the County brings suit upon this bond and judgment is recovered, the Surety shall pay all litigation expenses incurred by the County in such suit, including attorneys' fees, court costs, expert witness fees and investigation expenses.

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This bond inures to the benefit of any of the persons named in Civil Code section 9100, and such persons or their assigns shall have a right of action in any suit brought upon this bond, subject to any limitations set forth in Civil Code sections 9550 et seq. (Civil Code, Division 4, Part 6, Title 3, Chapter 5: Payment Bond for Public Works).

IN WITNESS WHEREOF the above-bounden parties have executed this instrument under their several seals this _____ day of _____, 21 , the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Corporate Seal) _____
Principal

By: _____

Title: _____

(Corporate Seal) _____
Surety

By: _____

Title: _____

Attach: 1) Copy of authorization for signature for Principal, and 2) original or certified copy of unrevoked appointment, Power of Attorney, Attorney-in-Fact Certificate bylaws or other instrument entitling or authorizing person executing bond on behalf of Surety to do so.

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WITHHELD CONTRACT FUNDS CERTIFICATION
Division 006200

PART 1 - GENERAL

1.01 Summary

A. Public Contract Code Section 22300 requires the inclusion in invitations for public agency bids and in public agency Contracts a provision which will, at the expense of the Contractor, permit the substitution of securities of equal value for any construction progress monies withheld to ensure performance under a Contract. Therefore, as the Contractor for the 331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER, PROJECT NO. 1701, Contractor hereby certifies the following:

[ ] I do not intend to substitute securities for monies withheld and thereby avail myself of the process and rights provided in Public Contract Code Section 22300.

[ ] I do intend to exercise my option as specified in Public Contract Code Section 22300 and hereby agree to the following:

1. I will establish an escrow Agreement satisfactory to the County, with a state or federally chartered bank, which shall contain at a minimum provisions governing inter alia:

   a. The amount of securities to be deposited;
   b. The type of securities to be deposited, (eligible securities for deposit are described in Government Code Section 16430);
   c. The providing of powers of attorney or other documents necessary for the transfer of the securities deposited;
   d. The terms and conditions of conversion to cash to provide funds to meet defaults by the Contractor including, but not limited to termination of the Contractor's control over the Work, stop notices filed pursuant to law, assessment of liquidated damages or other amounts to be kept or retained under the provisions of the Contract;
   e. The decrease in value of securities on deposit; and
   f. The termination of the escrow Agreement upon completion of the Contract and acceptance by the County.

2. I will obtain written consent of the Surety to any such escrow Agreement; and

3. I will attach to each progress payment submitted a notarized copy of escrow instructions executed by agents thereof and on bank letterhead as proof that such an account has been established. Such instructions will set forth that securities deposited shall not be withdrawn for any purpose (with Contractor's complete and unreserved Agreement) without prior written approval by the County of Monterey with respect to the Project herein above referenced.

_____
Signature of Contractor

END OF DOCUMENT

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ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

Division 006290

California Public Contract Code Section 22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this ____ day of _____, 2019, by and between the COUNTY OF MONTEREY, (hereinafter "Owner"), whose address is _____, _____. ("Contractor"), whose place of business is located at _____. Owner, as escrow agent **OR [ ] (Name of Bank)**_____ _____, a state or federally chartered bank in the State of California, whose place of business is located at _____ ("Escrow Agent").

For the consideration hereinafter set forth, Owner, Contractor and Escrow Agent agree as follows:

1. Pursuant to California Public Contract Code Section 22300, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to Contract Number _____ entered into between Owner and Contractor for 331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER PROJECT NO. 1701 located at 331 North Sanborn Road, County of Monterey, in the amount of $_____ _____ dated _____, 2021 (the "Contract"). Alternatively, on written request of Contractor, Owner shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify Owner within ten (10) Days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between Owner and Contractor. Securities shall be held in name of _____ _____, and shall designate Contractor as the beneficial owner.

2. Owner shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in the form and amount specified in Paragraph 1 of this Document 006290.

3. When Owner makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when Owner pays 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 Owner. Such expenses and payment terms shall be determined by Owner, Contractor, and Escrow Agent.

5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to Owner.

6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from Owner to Escrow Agent that Owner consents to withdrawal of amount sought to be withdrawn by Contractor.

7. Owner shall have the right to draw upon the securities in event of default by Contractor. Upon seven (7) Days written notice to Escrow Agent from Owner of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by Owner.

8. Upon receipt of written notification from Owner certifying that the Contract is final and complete, and that 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

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Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

9. Escrow Agent shall rely on written notifications from Owner and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Document 006290 and Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.

10. Names of persons who are authorized to give written notice or to receive written notice on behalf of Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as set forth below. Owner or Contractor may designate a different person authorized to give or receive written notice on their behalf with 48 hours written notice to the other parties listed below.

ON BEHALF OF OWNER:	**ON BEHALF OF CONTRACTOR:**
_____	_____
Title	Title
_____	_____
Name	Name
_____	_____
Signature	Signature
_____	_____
Address	Address
_____	_____
City/State/Zip Code	City/State/Zip Code

ON BEHALF OF ESCROW AGENT:

_____	_____
Title	Title
_____	_____
Name	Name
_____	_____
Signature	Signature
_____	_____
Address	Address
_____	_____
City/State/Zip Code	City/State/Zip Code

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

OWNER:

COUNTY OF MONTEREY

_____
Signature

_____
Print/Type Name

_____
Title

ATTEST:

_____
Signature

_____
Print/Type Name/Title

CONTRACTOR:

_____

_____
Signature

_____
Print/Type Name

_____
Title

_____
Signature

_____
Print/Type Name

_____
Title

ESCROW AGENT

_____
Escrow Agent/Title

_____
Print Name

_____
Signature

REVIEWED AS TO FORM:
Office of the County Counsel-Risk Management
Leslie J. Girard, County Counsel

_____
Mary Grace Perry, Deputy County Counsel
Counsel for Owner

_____
Print Name

_____
Date

At the time the Escrow Account is opened, Owner and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 006290.

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GUARANTY
Division 006536

TO: The COUNTY OF MONTEREY ("Owner"), for construction of the 331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER, 1021 Monterey-Salinas Highway, County of Monterey.

The undersigned guarantees all construction performed on this Project and also guarantees all material and equipment incorporated therein.

Contractor hereby grants to Owner for a period of one (1) year following the date of Final Completion of the Work completed, or such longer period specified in Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work. Final Completion shall be the date the Monterey County Board of Supervisors accepts all Work as complete.

Neither final payment nor use nor occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within one (1) year, or longer if specified, from the date of Final Acceptance of the Work completed.

If within one (1) year after the date of Final Acceptance of the Work completed, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, correct such Defective Work. Contractor shall respond within 24 hours after being notified in writing by Owner of any Work not in accordance with the requirements of the Contract or any defects in the Work. Contractor shall commence and prosecute with due diligence all Work necessary to fulfill the terms of this Guaranty, and to complete the Work within a reasonable period of time. Contractor shall remove any Defective Work rejected by Owner and replace it with Work that is not defective, and satisfactorily correct or remove and replace any damage to other Work or the Work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all Claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, Owner shall have all rights and remedies granted by law.

Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period.

All abbreviations and definitions of terms used in this Agreement shall have the meanings set forth in the Contract Documents.

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The foregoing Guaranty is in addition to any other warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor's duties, obligations, and performance under the Contract Documents. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of the Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor.

Date: _____, 20___

_____
Contractor's name

By: _____
Signature

_____
Print Name

_____
Title

_____
Street Address

_____
City, State, Zip code

& By: _____
Signature

_____
Print Name

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GENERAL CONDITIONS
Division 007100

PART I INTRODUCTION

ARTICLE 1 DEFINITIONS

1.00 Agreement. "Agreement" means "Contract", including all of the Contract Documents as defined below.

1.01 Architect. The "Architect" is the person or organization identified in the Agreement as Architect, or their authorized representative, or the replacement designated in writing by County.

1.02 Change Order. "Change Order" means a written modification of the Contract between County and Contractor, signed by County, Contractor, Construction Manager, and Architect.

1.03 Change Order Proposal. "Change Order Proposal" means a Contractor generated document in response to a Change Order Request (COR).

1.04 Change Order Request. "Change Order Request" (COR) means a document which informs Contractor of a proposed change in the Work, and appropriately describes or otherwise documents such change.

1.05 Close-Out Documents. "Close-Out Documents" means the product brochures, product/ equipment maintenance and operations instructions, manuals, and other documents/warranties, as-built record documents, affidavit of payment, release of lien and Claim, and as may be further defined, identified, and required by the Contract Documents.

1.06 Construction Documents. "Construction Documents" means all Drawings, Specifications, and Addenda associated with a specific construction Project.

1.07 Construction Manager. "Construction Manager" is the entity or person designated by the Health Department responsible for the management of the construction component of Project.

1.08 Contract. "Contract" means the entire Agreement between County and Contractor, including all of the Contract Documents.

1.09 Contract Date. "Contract Date" is the date when the Agreement between County and Contractor becomes effective.

1.10 Contract Documents. "Contract Documents" means all executed Agreements between the County and Contractor; any general, supplementary, or other contract conditions; the Drawings and Specifications; all Addenda issued prior to the execution of the Contract; and any other items specifically stipulated as being included in the Contract Documents.

1.11 Contract Sum. The "Contract Sum" is stated in the Agreement and is the total amount payable by County to Contractor for the performance of the Work under the Contract.

1.12 Contract Time. "Contract Time" means the period between the Start Date identified in the

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Notice to Proceed with Construction and the Substantial Completion Date identified in the Notice to Proceed or as subsequently amended by Change Order.

1.13 Contractor. "Contractor" means the individual, corporation, company, partnership, firm, or other entity contracted to perform the Work and identified as such in the Agreement, or their authorized representative, regardless of the type of construction Contract used, so that the term as used herein includes a Construction Manager, Construction Manager-at-Risk, or a Design-Build firm as well as a General or Prime Contractor. The Contract Documents refer to Contractor as if singular in number.

1.14 Contractor's Project Manager. "Contractor's Project Manager" is the person designated by the Contractor to manage the Work and the Superintendent.

1.15 County. "County" is the County of Monterey, the Owner of the Project and identified as such in the Agreement, or its authorized representative.

1.16 Date of Commencement. "Date of Commencement" means the date designated in the Notice to Proceed for Contractor to commence the Work.

1.17 Drawings. "Drawings" are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including Plans, elevations, sections, details, schedules, and diagrams.

1.18 Final Completion. "Final Completion" means the date on which, after Architect and Construction Manager certify that construction has been completed in accordance with the Contract Documents, the County Board of Supervisors accepts the Work.

1.19 Owner. "Owner" means the County of Monterey.

1.20 Owner's Representative. "Owner's Representative" means the individual assigned by County (Owner) to act on its behalf, and to undertake certain activities as specifically outlined in the Contract. The Owner's Representative is the only party authorized to direct changes to the scope, cost, or time of the Contract.

1.21 Plans. "Plans" means all Drawings, including sections and details; and any supplemental Drawings for complete execution of a specific Project.

1.22 Project. "Project" means all activities necessary for realization of the Work. This includes design, Contract award(s), execution of the Work itself, and fulfillment of all Contract and warranty obligations. The Work performed under this Contract is directed towards completion of all or a part of the Project.

1.23 Project Manager. "Project Manager" is a qualified individual or firm authorized by County to be responsible for coordinating time, equipment, money, tasks and people for all or specified portions of the Project.

1.24 Superintendent. "Superintendent" is the Contractor's representative at the Project Site. The Superintendent directs and coordinates the activities of the various trade groups at the Project Site.

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1.25 Samples. "Samples" are representative physical examples of materials, equipment, or workmanship, used to confirm compliance with requirements and/or to establish standards for use in execution of Work.

1.26 Schedule of Values. “Schedule of Values” means the detailed breakdown of the cost of the materials, labor, and equipment necessary to accomplish the Work as described in the Contract Documents, submitted by Contractor for approval by County, Construction Manager, and Architect.

1.27 Shop Drawings. "Shop Drawings" means the Drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data prepared by Contractor or any Subcontractor, manufacturer, supplier, distributor, or agents, and which detail some portion of the Work for fabrication and installation.

1.28 Site. "Site" is the geographical area of the location of Work.

1.29 Specifications. “Specifications” are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards, and workmanship for the Work, and performance of related services.

1.30 Subcontractor. "Subcontractor" is a person or organization who has a direct Contract with Contractor to perform any of the Work at the Site or to furnish material worked to a special design according to Plans and Specifications of this Work. The term "Subcontractor" also includes Sub-subcontractors performing Work at the Site or furnishing specially designed material for the Work, who have only an indirect relationship to Contractor.

1.31 Substantial Completion. “Substantial Completion” means the date determined and certified by Contractor, Architect, Construction Manager and County when the Work or a designated portion thereof is sufficiently complete, in accordance with the Contract, so as to be operational and fit for the use intended.

1.32 Sustainable Objective. “Sustainable Objective” is the County’s goal of incorporating sustainable measures into the design, construction, maintenance, and operations of the Project to achieve a Sustainability Certification or other benefit to the environment, to enhance the health and well-being of building occupants, or to improve energy efficiency.

1.33 Work. “Work” means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor’s obligations. The Work may constitute the whole or a part of the Project.

1.34 Working Drawings. “Working Drawings” mean a Drawing sufficiently complete with plan and section views, dimensions, details, and notes so that whatever is shown can be constructed and/or replicated without instructions but subject to clarifications. (see Drawings)

1.35 Standard Insurance. “Standard Insurance” means all insurance required by Division 007100 Article 32 INDEMNIFICATION AND INSURANCE *other than* Builders Risk/Course of Construction Property Insurance.

1.36 Builders Risk/Course of Construction Property Insurance. “Builders Risk/Course of Construction Property Insurance” means the property insurance required by Division 007100 Section 32.04.02.

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1.37 Defective Work. "Defective Work" is Work that, in Owner's judgment, is unsatisfactory or unsuited for the use intended, faulty, deficient, that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including, without limitation, approval of samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by Owner). Unapproved substitutions are defective.

ARTICLE 2 CONTRACT INTERPRETATION

2.01 Counting time. When any provision in the Contract Documents calls for computation of time in terms of days, the period so counted shall include all calendar days within the period, including usual Work days as well as weekends and holidays. Business Days and Work days refer to Monday through Friday, eight (8) hour duration.

2.02 Gender and number. References to one gender include the other; references to either singular or plural include the other.

2.03 Headings. Article and paragraph headings are for convenience only, and shall not be used to interpret the provisions of this Contract.

2.04 Express and implied Work requirements. This Contract requires the performance of all elements of Work expressly mentioned herein, together with all elements of Work that are reasonably inferable from the express terms of this Contract as being necessary for the proper completion of the Work.

2.05 Technical or trade meanings. Words which have well known technical or trade meanings are used herein in accordance with such recognized meanings.

2.06 Interpretations by Architect. Written interpretations necessary for the proper execution or progress of the Work, in the form of Drawings or otherwise, will be issued with reasonable promptness by Architect and in accordance with any schedule agreed upon. Contractor shall make written request to Architect for such interpretations. Such interpretations shall be consistent with, and reasonably inferable from the Contract Documents, and may be made by field orders issued pursuant to Article 18.

2.07 Conflicts among Contract Documents - priorities. Contract Documents are complementary; what is called for by one is as binding as if called for by all. If there is any conflict between any of the Contract Documents, the conflict shall be resolved by giving effect to the provisions in the documents having higher priority and by disregarding conflicting provisions in documents having lower priority, as follows: first priority, any modifications, with the most recent having priority over earlier modifications; second priority, the Agreement; third priority, any Addenda, with the most recent having priority over earlier Addenda; fourth priority, the Supplementary Conditions; and fifth priority, the General Conditions.

A. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:

1. Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
2. Agreement Forms (Document 005000), and terms and conditions referenced therein;
3. Supplementary General Conditions (Document 007301 et seq), if included;

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4. General Conditions (Document 007100);
5. Division 1 Specifications, if included;
6. Drawings and Technical Specifications (Division 2 and above);
7. Written numbers over figures, unless obviously incorrect;
8. Figured dimensions over scaled dimensions;
9. Large-scale Drawings over small-scale Drawings.

B. Any conflict between Drawings and Technical Specifications (Division 2 and above) will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

C. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.

D. All Technical Specifications included in the Project manual shall be included within the Contract Documents unless identified otherwise.

ARTICLE 3 CONTRACT DOCUMENTS

3.01 Contract Documents. Contract Documents consist of all component parts of the Contract as specified in the Agreement.

3.02 Contract. The Contract Documents form the Contract. The Contract represents the entire and integrated Agreement between the parties hereto and supersedes all prior negotiations, representations, or Agreements, either written or oral, including the bidding documents. The Contract may be amended or modified only by a modification as defined in Section 3.03. No Contractor or Subcontractor may be awarded a Contract for Public Works on a Public Works Project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

3.03 Modification. A modification is (1) a written amendment to the Contract signed by both parties (2) a Change Order (3) a written interpretation issued by Architect or (4) a written order for a minor change in the Work issued by Architect pursuant to Article 18. A modification may be made only after execution of the Contract.

3.04 Execution in quadruplicate. Unless otherwise specified in the Agreement, the Contract Documents shall be signed in not less than quadruplicate by County and Contractor.

3.05 Familiarity with Site and local conditions.

A. Prior to submitting a bid, and prior to executing this Contract, Contractor shall visit the Work site, familiarize himself/herself/itself with the local conditions under which the Work is to be performed, and correlate his/her observations with the requirements of this Contract. Contractor's investigation shall include, without limitation, requesting and thoroughly examining of all reports of exploration and tests of subsurface conditions, as-built Drawings, Drawings, product Specification(s) or reports, made available by Owner for contracting purposes or during Contractor's pre-bid investigations, of existing above ground and (to the extent applicable) below ground conditions (together, "Existing Conditions Data"), including, as applicable, Underground Facilities, geotechnical data, as-built data, utility surveys, record documents of all types, hazardous materials surveys, or similar materials which may appear or be referenced in the Project Manual or the in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by

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Contractor and safety precautions and programs incident thereto.

B. Contractor's investigations shall consider fully the fact that Existing Conditions Data is in many cases based on information furnished to Owner by others (e.g., the prior owner or builders), and that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor shall also: (i.) provide Owner with prompt written notice of all conflicts, errors, ambiguities, or discrepancies of any type, that it discovered in or among the Contract Documents and the Existing Conditions Data, and (ii.) subject to Owner's approval, conduct any such additional or supplementary examinations, investigations, explorations, tests, studies and data compilations, concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which Contractor may deem necessary in order to perform and furnish the Work in accordance with the terms and conditions of Contract Documents.

C. By executing the Contract, Contractor represents that he/she/it has familiarity with Site and local conditions. Based on such visits and investigations, Contractor shall notify County, in writing, of any discrepancies between the local conditions and the requirements of the Contract. Contractor's failure to notify County prior to submitting its bid shall be deemed an acknowledgment of and acceptance of any such discrepancies, and a waiver of any Claims for extra Work, which may result therefrom.

D. During performance of the Contract, Contractor will be charged with knowledge of all information that it should have learned in performing these pre-bid investigations and other obligations, and shall not be entitled to Change Orders (time or compensation) due to any information, error, inconsistency, omission, or conditions that Contractor should have known as a part of this Work. Contractor shall be responsible for the resultant losses, including, without limitation, the cost of correcting Defective Work.

3.06 Limited Reliance Permitted On Owner's Existing Conditions Data.

A. Information regarding aboveground and as-built conditions shown on the Contract Documents or supplied by Owner has been compiled in good faith. However, Owner does not expressly or impliedly warrant or represent that such information is correctly shown or indicated, or otherwise complete for construction purposes. Contractor must independently verify such information as part of its pre-bid investigations, and where conditions are not reasonably verifiable or discrepancies are identified, bring such matters to Owner's attention through written question issued during the bid period. In executing Document 005000 (Agreement), Contractor shall rely on the results of its own independent investigation and shall not rely on Owner supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification Work sufficient to complete the Work as intended.

B. Regarding subsurface conditions other than Underground Facilities shown on the Contract Documents or otherwise supplied by Owner, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. Owner is not responsible for the completeness of any subsurface condition information, Contractor's conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, Owner is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

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3.07 Pre-Bid Investigation Requirements For Excavation And Utilities Relocation Projects.

A. As part of its pre-bid investigations for Projects involving excavation and/or relocation of existing utilities, Contractor shall make reasonable efforts to verify information regarding Underground Facilities, including but not limited to, requesting additional information or verification of information as necessary.

B. Because of the nature and location of Owner and the Project, the existence of Underground Facilities is deemed inherent in the Work of the Contract, as is the fact that Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. Contractor shall, therefore, take care to note the existence and potential existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site). Contractor shall also consider local underground conditions and typical practices for Underground Facilities, either through its own direct knowledge or through its Subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.

3.08 Contract Documents furnished to Contractor. Unless otherwise provided in the Contract Documents, Contractor will be furnished, one full size set and one half size set of all the Contract Documents, including the Plans, Specifications, and working details to facilitate the execution of the Work. Additional copies of the Contract Documents may be obtained at cost of reproduction.

3.09 Ownership of documents. All Plans, Specifications, working details, and copies thereof furnished by Architect are and shall remain the property of County. Such documents shall not be used on any other Project and shall be returned to County on request at the completion of the Work.

3.10 Organization of Contract Documents not controlling. The organization of the Specifications into divisions, sections, and articles, and the arrangement of the Plans or working details shall not control Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

3.11 Contract Documents on-site. Contractor will at all times maintain at least one complete, up-to-date set of the Contract Documents, showing approval by the State Fire Marshal (including the original documents as well as all Change Orders and other supplemental and additional documents) on the Site, to be available to County, Architect, and their representatives.

ARTICLE 4 SUBCONTRACTORS

4.01 Subcontractor Listing Law.

A. Contractor shall comply with the Subcontractor Listing law, California Public Contract Code Sections 4101 et seq. Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid except as may be allowed by law.

B. Subcontractors shall not assign or transfer their Subcontracts or permit them to be performed by any other Contractor without Owner's written approval. At Owner's request, Contractor shall provide Owner with a complete copy of all executed Subcontracts or final commercial Agreements with Subcontractors and/or suppliers.

C. No contractual relationship between County and Subcontractors. Nothing contained in the Contract Documents shall create any contractual relation between County, Architect, or Construction Manager, and any Subcontractor.

4.02 Subcontracts.

A. Subcontract Agreements shall preserve and protect the rights of Owner under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor's written Agreement (1) to be bound to the terms of Contract Documents and (2) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward Owner under the Contract Documents. (These Agreements include for example, and not by way of limitation, all warranties, Claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)

B. Contractor shall provide for the assignment to Owner of all rights any Subcontractor (of any tier) may have against any manufacturer, supplier, or distributor for breach of warranties and guarantees relating to the Work performed by the Subcontractor under the Contract Documents. Subcontracts shall provide and acknowledge Owner as an intended third-party beneficiary of each Subcontract and supply Contract (of any tier).

4.03 Contracts with Subcontractors.

All Work performed for Contractor by a Subcontractor shall be pursuant to a written Agreement between Contractor and the Subcontractor (and where appropriate, between Subcontractors and Sub-subcontractors). All such Agreements shall require performance by the Subcontractors in conformity with the terms of this Contract, and shall include all the terms of this Contract, which are applicable to Subcontractors.

4.04. Payments to Subcontractors.

A. Contractor shall pay each Subcontractor, upon receipt of payment from County, an amount equal to the percentage of completion allowed to Contractor on account of such Subcontractor's Work, less the percentage retained from payments to Contractor. Contractor shall also require each Subcontractor to make similar payments to its Subcontractors. County shall have the right, but not the obligation, to issue payment by joint checks payable to the order of Contractor and any of its Subcontractors.

B. If the Construction Manager fails to issue a certificate for payment for any cause which is the fault of Contractor and not the fault of a particular Subcontractor, Contractor shall pay the Subcontractor on demand, made at any time after the certificate for payment should otherwise have been issued, for his/her/its Work to the extent completed, less the retained percentage.

C. Neither County nor Construction Manager shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law. All monies paid to Contractor hereunder shall immediately become and constitute a trust fund and shall be applied by Contractor for the benefit of all persons supplying labor, materials, or equipment in connection with the Work and shall not be diverted to any other purpose until the Claims of such persons have been discharged.

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4.05 Information provided to Subcontractors. Construction Manager, County, and Architect may, on request, and at their discretion, furnish to any Subcontractor, if practicable, information regarding percentages of completion certified to Contractor on account of work done by such Subcontractors.

4.06 Contractor's responsibility for Work of Subcontractors. Contractor shall be as fully responsible to County for the acts and omissions of any Subcontractor and of persons either directly or indirectly employed by the Subcontractors, as Contractor is for acts and omissions of persons directly employed by him/her/it.

ARTICLE 5: DRAWINGS AND SPECIFICATIONS

5.01 Intent of Drawings and Specifications.

A. Contractor shall interpret words or phrases used to describe Work (including services), materials, or equipment that have well known technical or construction industry or trade meaning in accordance with that meaning. Drawings and Specifications specifically include the intent to depict construction that complies with all applicable laws, codes and standards.

B. As part of the "Work," Contractor shall provide all labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, hoisting facilities, Shop Drawings, storage, testing, security, transportation, disposal, the securing of all necessary or required field dimensions, the cutting or patching of existing materials, notices, permits, documents, reports, Agreements and any other items required or necessary to timely and fully complete Work described and the results intended by Contract Documents and, in particular, Drawings and Specifications. Divisions and Specification Sections and the identification on any Drawings shall not control Contractor in dividing Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.

C. Contractor shall perform reasonably implied parts of Work as "Incidental Work" although absent from Drawings and Specifications. Incidental Work includes any Work not shown on Drawings or described in Specifications that is necessary or normally or customarily required as a part of the Work shown on Drawings or described in Specifications. Incidental Work includes any Work necessary or required to make each installation satisfactory, legally operable, functional, and consistent with the intent of Drawings and Specifications or the requirements of Contract Documents. Contractor shall perform Incidental Work without extra cost to Owner. Incidental Work shall be treated as if fully described in Specifications and shown on Drawings, and the expense of Incidental Work shall be included in price Bid and Contract Sum.

5.02 Checking Of Drawings And Specifications.

A. Before undertaking each part of Work, Contractor shall carefully study and compare Contract Documents and check and verify pertinent figures shown in the Contract Documents and all applicable field measurements. Contractor shall be responsible for any errors that might have been avoided by such comparison. Figures shown on Drawings shall be followed; Contractor shall not scale measurements. Contractor shall promptly report to Owner, in writing, any conflict, error, ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written interpretation or clarification from Owner before proceeding with any Work affected thereby. Contractor shall provide Owner with a follow-up correspondence every ten (10) days until it receives a satisfactory interpretation or clarification.

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5.03 Interpretation Of Drawings And Specifications.

A. A typical or representative detail on Drawings shall constitute the standard for workmanship and material throughout corresponding parts of Work. Where necessary, and where reasonably inferable from Drawings, Contractor shall adapt such representative detail for application to such corresponding parts of Work. The details of such adaptation shall be subject to prior approval by Owner. Repetitive features shown in outline on Drawings shall be in exact accordance with corresponding features completely shown.

B. Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in Drawings and Specifications, or should Contractor have any questions or requests relating to Drawings or Specifications, Contractor shall refer the matter to Owner, in writing, with a copy to the Architect. Owner will issue with reasonable promptness written responses, clarifications or interpretations as Owner may determine necessary, which shall be consistent with the intent of and be reasonably inferable from Contract Documents. Such written clarifications or interpretations shall be binding upon Contractor. If Contractor believes that a written response, clarification or interpretation justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give Owner prompt written notice. If the parties are unable to agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in conformance with Owner's response, clarification, or interpretation and may make a written Claim for the adjustment as provided in Article 33.

C. The following general Specifications shall apply wherever in the Specifications, or in any directions given by Owner in accordance with or supplementing Specifications, it is provided that Contractor shall furnish materials or manufactured articles or shall do Work for which no detailed Specifications are shown. Materials or manufactured articles shall be of the best grade, in quality and workmanship, obtainable in the market from firms of established good reputation. If not ordinarily carried in stock, the materials or manufactured articles shall conform to industry standards for first class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work shall conform to the usual standards or codes, such as those cited herein, for first class Work of the kind required. Contractor shall specify in writing to Owner the materials to be used or Work to be performed under this Section ten (10) Business Days prior to furnishing such materials or performing such Work.

5.04 Use Of Drawings And Specifications. Drawings, Specifications and other Contract Documents were prepared for use for Work of Contract Documents only. No part of Contract Documents shall be used for any other construction or for any other purpose except with the written consent of Owner. Any unauthorized use of Contract Documents is prohibited and at the sole liability of the user.

PART II CONDUCT OF WORK

ARTICLE 6 CONTRACT ADMINISTRATION BY ARCHITECT AND CONSTRUCTION MANAGER

6.01 No contractual relationship between Architect, Construction Manager, and Contractor. Nothing contained in the Contract Documents shall create any contractual relationship between Architect, Construction Manager, and Contractor or any Subcontractor.

6.02 The Role of the Architect and Construction Manager. The Architect and Construction Manager will be County's representatives during construction and until final payment as provided in this Agreement. The Architect and the Construction Manager will have authority to act on behalf of

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County to the extent provided in the Contract Documents, unless otherwise modified by written instrument which will be shown to Contractor. Construction Manager will advise and consult with County, and all of County's instructions to Contractor shall be issued through the Construction Manager. The Construction Manager will provide general administration of the contract, including performance of the functions hereinafter described. The Construction Manager will provide management of construction in the field. The Construction Manager is responsible for managing the construction schedule, construction budget, and has the authority to act on behalf of County as relating to the management of these items.

6.03 Instructions issued through Construction Manager. County shall issue instructions to Contractor through the Construction Manager, provided that County shall have the right, but not the obligation, to itself or through other Project representatives to issue Change Orders, require additional Work and/or direct the omission of Work previously ordered by written instructions directly to Contractor, provided such Project representative and instructions have been previously approved, in writing, by County.

6.04 Construction Manager, and Architect access to Work. County, Construction Manager, and Architect shall at all times have access to the Work wherever it is in preparation and progress. Contractor shall provide facilities for such access so County, Construction Manager, and Architect may perform their functions under the Contract.

6.05 Inspections. Architect will make periodic visits to the Site to familiarize himself/herself generally with the progress and quality of the Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. On the basis of his/her on-site observations, he/she will keep County informed of the progress of the Work, and will endeavor to guard County against defects and deficiencies in the Work of Contractor. Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. They will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, and they will not be responsible for Contractor's failure to carry out the Work in accordance with the Contract Documents, except to the extent such failure is due to Architect’s breach of Agreement with County or is otherwise due to the negligence or willful misconduct of Architect.

6.06 Determination of payments to Contractor. Based on such observations and Contractor's applications for payment, Architect and Construction Manager will determine the amounts owing to Contractor and will issue certificates for payment in such amounts, as provided in Article 21.

6.07 Decisions on artistic effect. Architect’s decisions in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents.

6.08 Authority to reject Work or to require special inspection or testing. Construction Manager and Architect may reject Work which does not conform to the Contract Documents. Whenever, in their reasonable opinion, they consider it necessary or advisable to ensure the proper implementation of this Contract, they may require special inspection or testing of the Work in accordance with Article 13, whether or not such Work is then fabricated, installed, or completed. However, the Construction Manager’s and Architect’s authority to act under this Section, nor any decision made by them in good faith either to exercise or not to exercise such authority, shall not give rise to any duty or responsibility of Construction Manager or Architect to Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work.

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6.09 Review of Shop Drawings and Samples. Architect will review Shop Drawings and samples as provided in Article 8.

6.10 Change Orders prepared by Construction Manager. Construction Manager will prepare Change Orders and may order minor changes in the Work in accordance with Article 18.

6.11 Inspections and document review. Construction Manager will conduct inspections of the Work (including a final inspection); receive and review written guarantees and related documents required by the Contract and assembled by Contractor; and issue a final certificate for payment.

6.12 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Construction Manager, and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents. Communications by and with Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with the County's own forces shall be through the County designee.

ARTICLE 7 SERVICES PROVIDED BY COUNTY

7.01 Easements obtained by County. County shall secure and pay for all easements, rights-of-way, and fee interests in land necessary to enable Contractor to complete the Work.

7.02 Surveys provided by County. County shall furnish all surveys describing the existing physical characteristics, legal limits, and utility locations for the Site of the Project. Unless specifically provided for in the Plans and Specifications, County shall not provide field engineering or construction staking.

7.03 Information and services provided by County. Information or services under County's control shall be furnished by County with reasonable promptness to avoid delay in the orderly progress of the Work. The County shall endeavor to forward all communications to the Contractor through the Construction Manager and shall contemporaneously provide the same communication to the Architect about matters arising out of or relating to the Contract Documents.

ARTICLE 8 - OWNER'S ADMINISTRATION OF WORK

8.01 Owner's Representative(s).
Owner's Representative(s) will have limited authority to act on behalf of Owner as set forth in the Contract Documents.

8.02 Owner's Observation Of The Work.

A. Work shall be performed under Owner's general observation and administration. Contractor shall comply with Owner's directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. Owner's failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any nonconforming aspect of Work.

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B. Subject to those rights specifically reserved in the Contract Documents, Owner will not supervise, or direct, or have control over, or be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor's failure to comply with laws and regulations applicable to the furnishing or performance of Work. Owner will not be responsible for Contractor's failure to perform or furnish the Work in accordance with Contract Documents.

8.03 Architect's Observation Of Work.

A. Owner may engage an Architect, an independent consultant or Project Manager (collectively for purposes of this Section, "Project Manager/Architect") to assist in administering the Work. If so engaged, Project Manager/Architect will advise and consult with Owner, but will have authority to act on behalf of Owner only to extent provided in the Contract Documents or as set forth in writing by Owner. Project Manager/Architect will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with Work. Project Manager/Architect will not be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.

B. Project Manager/Architect may review Contractor's submittals, such as Shop Drawings, product data, and samples, but only for conformance with design concept of Work and with information given in the Contract Documents.

C. Project Manager/Architect may visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. Based on its observations, Project Manager/Architect may recommend to Owner that it disapproves or rejects Work that Project Manager/Architect believes to be defective or will not produce a complete Project that conforms to Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by Contract Documents. Owner will also have authority to require special inspection or testing of Work, whether or not the Work is fabricated, installed or completed.

D. Project Manager/Architect may conduct inspections to recommend to Owner the dates that Contractor has achieved Substantial Completion and Final Completion, and will receive and forward to Owner for review written warranties and related documents required by Contract Documents.

8.04 Owner's And Architect's Exercise Of Contract Responsibilities.

A. Owner, Project Manager, Architect and all Owner's representatives, in performing their duties and responsibilities under the Contract Documents, accept no duties, responsibilities or duty of care, nor may the same be implied or inferred, towards Contractor, any Subcontractor, Sub-subcontractor or supplier, except those set forth expressly in the Contract Documents.

8.05 Owner's Right Of Access To The Work. During performance of Work, Owner and its agents, consultants, and employees may at any time enter upon Work, shops or studios where any part of the Work may be in preparation, or factories where any materials for use in Work are being or are to be manufactured, and Contractor shall provide proper and safe facilities for this purpose, and shall make arrangements with manufacturers to facilitate inspection of their processes and products to such extent

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as Owner's interests may require. Other Contractors performing Work for Owner may also enter upon Work for all purposes required by their respective Contracts. Subject to the rights reserved in the Documents, Contractor shall have sole care, custody, and control of the Site and its Work areas.

8.06 Owner's Right Of Separate Construction.

A. Owner may perform with its own forces, construction or operations related to the Project, or the Site during Contractor's operations. Owner may also award separate Contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility Owners perform other Work.

B. Contractor shall adjust its schedule and fully coordinate with and shall afford all other Contractors, utility districts and Owner (if Owner is performing Work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others' Work, do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other Work, and shall cooperate with them to facilitate the progress of the Work.

C. To the extent that any part of Contractor's Work is to interface with Work performed or installed by other Contractors or utility owners, Contractor shall inspect and measure the in-place Work. Contractor shall promptly report to Owner in writing any defect in in-place Work that will impede or increase the cost of Contractor's interface unless corrected.

ARTICLE 9 CONTRACTOR'S ADMINISTRATIVE DUTIES

9.01 Review of Contract Documents for errors. Contractor shall carefully study and compare the Contract Documents and shall, at once, report, in writing, to Architect, with a copy to Construction Manager, any error, inconsistency, or omission he/she may discover. Contractor shall not be liable to County or Architect for any damage resulting from any such errors, inconsistencies, or omissions in the Contract Documents which were reported, in writing, by Contractor to Architect, with a copy of the correspondence to Construction Manager, provided no provisions herein shall relieve Contractor from liability for errors, inconsistencies, or omissions which were known or reasonably should have been known to Contractor, which were not disclosed in writing to Architect, with a copy of the correspondence to Construction Manager.

9.02 Taxes. Contractor shall pay all sales, consumer, use, and other similar taxes required by law.

9.03 Transportation and utility service. Contractor shall pay for all transportation and utility service not later than the 20th day of the calendar month following that in which such services are rendered.

9.04 Contractor's Superintendent. Contractor shall employ a competent, qualified Superintendent who shall provide full time, on-site supervision of all aspects of the Work. Full time means any and all times that Contractor, its agents, employees, or Subcontractors are performing any and all Work. The Contractor, as soon as practicable after award of the Contract, shall furnish, in writing, to County and Architect through Construction Manager, the name and qualifications of a proposed Superintendent. The Construction Manager may reply within fourteen (14) days to the Contractor in writing state (1)

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whether County, the Construction Manager, or Architect has reasonable objection to the proposed Superintendent or (2) that any of them require additional time to review. Failure of the Construction Manager to reply within the fourteen (14) day period shall constitute notice of no reasonable objection. The Superintendent shall be satisfactory to County, Construction Manager, or Architect and shall not be changed except with the consent of County. County may request at any time that a Contractor remove its Superintendent from the Project and provide an alternate Superintendent as approved by County. The Superintendent shall represent Contractor and all communications given to the superintendent shall be as binding as if given to Contractor. Important communications will be confirmed in writing. Other communications will be so confirmed on written request in each case.

9.05 Contractor's Project Manager. Contractor shall employ a competent, qualified Project Manager to manage the entire construction Project and the Superintendent. Contractor shall provide Construction Manager with the Contractor's Project Manager's résumé. County and Architect must approve the Contractor's Project Manager. County reserves the right to interview the Project Manager at any time. County at any time during the course of construction may require Contractor to substitute the Project Manager based on poor performance, lack of experience, product knowledge, Project management skills, or the ability to prosecute the Work in a workmanlike manner.

9.06 Contractor's responsibility for agents and employees. Contractor shall employ, and shall permit its Subcontractors to employ, only competent and skillful personnel to do Work. If Owner notifies Contractor that any of its employees, or any of its Subcontractors' employees on Work is incompetent, unfaithful, disorderly or profane, or fails to observe customary standards of conduct or refuses to carry out any provision of the Contract Documents, or uses threatening or abusive language to any person on Work representing Owner, or violates sanitary rules, or is otherwise unsatisfactory, and if Owner requests that such person be discharged from Work, then Contractor or its Subcontractor shall immediately discharge such person from Work and the discharged person shall not be re-employed on the Work except with consent of Owner. Contractor shall be responsible to County for the acts and omissions of all his/her/its employees and all Subcontractors, their agents, and employees, and all other persons performing any of the work under a Contract with Contractor.

9.07 Communication through Construction Manager.

A. Contractor shall forward all communications to County through the Construction Manager.

B. Except as otherwise provided in these Contract Documents or subsequently identified in writing by Owner, Owner will issue all communications to Contractor through Owner's Representative, and Contractor shall issue all communications to Owner through Owner's Representative in a written document delivered to Owner.

C. Should any direct communications between Contractor and Owner's consultants, architects or engineers occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to Owner.

D. All communications recognized under the Contract Documents shall be submitted using a computerized cloud based document control and storage system (hereafter referred to in this Section as "System"). This excludes documents requiring signatures as outlined in 9.08 B. Electronic transfer of such correspondence shall be submitted using the System, rather than email. Generally, email communication shall be avoided and all official communication shall be submitted through the System.

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E. The general Contractor and Subcontractors' use and access to such System will be as established by the County. The Contractor and their Subcontractors' use of the System will be without charge or expense provided, however, the Contract Time and the Contract Sum shall not be subject to adjustment on account of the use of the System or training of the Contractor and their Subcontractors' personnel on the use and functions of the System. All Project Documents such as; submittals, Requests For Information (RFI), Payment Application, Change Order Requests, Daily Reports, Change Orders and any other miscellaneous Project Documents will be received and processed by the County in an electronic form through the System.

9.08 Communications And Information Distribution.

A. All communications recognized under the Contract Documents shall be in writing, in the form of a serialized document, by type of communication. For example, RFI's shall be serialized beginning with RFI No. 1; payment applications shall be serialized beginning with Payment Application No. 1, submittals shall be serialized per Specification Section and transmitted with transmittal sheets beginning with Transmittal No. 1; and correspondence shall be serialized beginning with letter No. 1. Contractor may propose other record management and identification systems or protocols, intended to facilitate orderly transmittal of Project information, storage and retrieval of such information, which Owner will review consistent with these stated objectives, and accept or reject in its sole discretion.

B. Documents Requiring Signatures. All documents requiring signatures for approval prior to implementing action, as stipulated in other portions of Contract Documents, shall require a manually signed, serialized letter delivered to the other party at its address for notice otherwise specified in the Contract Documents, either personally or by mail.

C. Electronic data transfer of such correspondence will serve to expedite preliminary concurrence of information, only. Receipt of "hard copy" signature on forms is required prior to implementing action or Work as the conditions may require. For example, Change Orders and authorizations for extra cost, require signatures. A party may acknowledge receipt of PDF copies of required correspondence by email, but in the absence of such acknowledgment, mail or personal delivery is required.

D. All emails shall be copied to Owner, Construction Manager, Architect, and Contractor's Superintendent/Project Manager. Owner reserves the right to preclude email communication, in whole or in part, as Project needs may require. Communication between Owner and Contractor shall not be via Twitter, Facebook, or other types of instant text message systems. Any such communications shall be inadmissible for any purpose related to this Contract.

ARTICLE 10 GENERAL PROVISIONS REGARDING CONDUCT OF WORK

10.01 No Work without Construction Documents. Contractor shall do no Work without current Plans, Specifications, working details, etc.

10.02 Supervision and construction procedures. Contractor shall supervise and direct the Work, using his/her/its best skill and attention. Contractor shall be solely responsible for all construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract.

10.03 Contractor's responsibility for labor, materials, and equipment. Unless otherwise specifically noted, Contractor shall provide and pay for all labor, materials, equipment, and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and

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completion of the Work.

10.04 Conduct and skill of employees. Contractor shall at all times enforce strict discipline and good order among Contractor's employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him/her. Any person in the employ of Contractor whom County may deem incompetent or unfit shall be dismissed from the Work and shall not again be employed on it except with the written consent of County.

10.05 Contractor's Construction Schedule. Contractor, immediately after being awarded the Contract, shall prepare and submit for County's and Architect's information and the Construction Manager's approval, an estimated Construction Schedule for the Work. The Construction Schedule shall be related to the entire Project to the extent required by the Contract Documents. The Construction Schedule shall indicate the dates for the starting and completion of the various stages of construction and shall be revised weekly, subject to Architect's approval. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the construction or operations of the Owner's own forces. The Contractor shall make revisions to the Construction Schedule as deemed necessary by the Construction Manager to conform to the Project Schedule.

10.06 Dimensions to be checked. All dimensions shall be carefully checked by the various artisans. Each Contractor shall be held responsible for the accuracy of the dimensions of its own Work. Dimensions shown on Plans shall be adhered to insofar as it is possible, and no deviation from such dimensions shall be made except with the consent of Architect. Where the Work of one Contractor comes in contact with the Work of another Contractor, each Contractor shall carefully check all dimensions which affect its own Work. Wherever possible, dimensions shall be taken at the building, but no Work shall be delayed or held up waiting for building dimensions, when by the exercise of foresight and proper cooperation, the dimensions may be established in advance of construction. Contractor shall verify all dimensions at the Site and shall be solely responsible for same or deviations from same.

10.07 Cutting and patching. Contractor shall be responsible for any cutting, fitting, and patching that may be required to complete his/her/its Work, except as otherwise specifically provided in the Contract Documents. Contractor shall not endanger any Work of any other Contractors by cutting, excavating, or otherwise altering any Work and shall not cut or alter the Work of any other Contractor except with the written consent of Construction Manager.

10.08 Revision of operations. When, in the judgment of County, it becomes necessary to accelerate the Work, Contractor when so ordered shall concentrate Contractor's forces at such points as directed and execute such portions of the Work as may be required.

10.09 Damage to Work and property on-site. All damage or loss to any property on or near the Site caused in whole or in part by Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, shall be remedied by Contractor, at Contractor's expense, except damage or loss attributable to faulty Specifications or working details, or to the acts or omissions of County, Construction Manager, Architect, or anyone employed by either of them, or for whose acts either of them may be liable, and not attributable to the fault or negligence of Contractor.

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ARTICLE 11 SHOP DRAWINGS AND SAMPLES

11.01 Submittal of Shop Drawings and samples. Contractor shall review, stamp with Contractor's approval, and submit to Construction Manager, in accordance with the Submittal Schedule, with reasonable promptness and in orderly sequence so as to cause no delay in the Work or in the Work of any other Contractor, all Shop Drawings and samples required by the Contract Documents or subsequently by Architect as covered by modifications. Shop Drawings and samples shall be properly identified as specified, or as Architect may require. At the time of submission, Contractor shall inform Construction Manager and Architect, in writing, of any deviation in the Shop Drawings or samples from the requirements of the Contract Documents.

11.02 Warranties concerning Shop Drawings and samples. By approving and submitting Shop Drawings and samples, Contractor thereby represents that Contractor has determined and verified all field measurements, field construction criteria, materials, catalog numbers, and similar data, or will do so, and that Contractor has checked and coordinated each Shop Drawing and sample with the requirements of the Work and of the Contract Documents.

11.03 Architect review and approval. Architect will review Shop Drawings and samples with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the Project and with information given in the Contract Documents. Architect's approval of a separate item shall not indicate approval of an assembly in which the item functions.

11.04 Corrections. Contractor shall make any corrections required by Architect and shall resubmit the required number of corrected copies of Shop Drawings or new samples until approved. Contractor shall direct specific attention, in writing, or on resubmitted Shop Drawings, to revisions other than the corrections requested by Architect on previous submissions.

11.05 Contractor's responsibility. Architect's approval of Shop Drawings or samples shall not relieve Contractor of responsibility for any deviation at the time of submission, nor shall Architect's approval relieve Contractor from responsibility for errors or omission in the Shop Drawings or samples.

11.06 Completion of Work in accordance with Shop Drawings and samples**.** No portion of the Work requiring a Shop Drawing or sample submission shall be commenced until Architect has approved the submission. All such portions of the Work shall be in accordance with approved Shop Drawings and samples.

ARTICLE 12 SEPARATE CONTRACTS ON SAME PROJECT

12.01 County's right to award separate Contracts. County reserves the right to award other Contracts in connection with other portions of the Project.

12.02 Coordination among Contractors. Contractor shall ascertain to Contractor's own satisfaction the scope of the Project and the nature of any other Contracts that have been or may be awarded by County in prosecution of the Project, to the end that Contractor may perform this Contract in light of such other Contracts, if any. Nothing herein shall be interpreted as granting to Contractor exclusive occupancy at the Site. Contractor shall not cause any unnecessary hindrance or delay to any other Contractor working on the Project. If simultaneous execution of any Contract for the Project is likely to cause interference with the performance of some other Contract or Contracts, County shall decide which Contractor shall cease Work temporarily and which Contractor shall continue or whether Work

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can be coordinated so that Contractors may proceed simultaneously.

12.03 Responsibility to other Contractors. Contractor shall afford other Contractors on the same Project reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their Work, and shall properly connect and coordinate Contractor's Work with theirs.

12.04 Duty to inspect other Contractor's Work. If any part of Contractor's Work depends for proper execution or results upon the Work of any other separate Contractor, Contractor shall inspect and promptly report to Construction Manager any apparent discrepancies or defects in such Work that render it unsuitable for such proper execution and results. Failure of Contractor to inspect and report shall constitute an acceptance of the other Contractor's Work as fit and proper, except as to defects which may develop in the other separate Contractor's Work after the execution of Contractor's Work. Any Work exhibiting unacceptable quality as defined by the Contract Documents will result in Contractor's payment (or a portion thereof) being withheld until the unacceptable Work is corrected to meet the required quality standards, per Article 19 herein.

12.05 Damage to other Contractor's Work. Should Contractor cause damage to the Work or property of any separate Contractor on the Project, Contractor shall, upon due notice, settle with such other contractor by Agreement or arbitration, if he/she/it will so settle. If such separate Contractor sues County or initiates an arbitration proceeding on account of any damage alleged to have been so sustained, County shall notify Contractor who shall defend such proceedings and indemnify and hold harmless County.

12.06 Responsibility for costs caused by one (1) Contractor to another. Any costs to one (1) Contractor or his/her/its Subcontractors on the Project caused by defective or ill-timed Work by another Contractor or his/her/its Subcontractors on the Project shall be borne by the party responsible for such defective or ill-timed Work.

12.07 County's right to settle disputes over cleanup. If a dispute arises between the separate contractors as to their responsibility for cleaning up under Section 16.08, County may clean up and charge the cost thereof to the several Contractors, as determined by County.

ARTICLE 13 TESTS

13.01 Contractor's responsibility for required tests. If Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any Work to be inspected, tested, or approved, Contractor shall give Construction Manager and Architect timely notice of its readiness and of the date arranged so Construction Manager and Architect may observe such inspection, testing, or approval. County shall bear all costs of such inspections, tests, and approval, unless otherwise provided.

13.02 Responsibility for tests not anticipated in Contract. If after the commencement of the Work, Construction Manager, Architect, or County determines that any Work requires special inspection, testing, or approval which Section 13.01 does not include, he/she will, upon written authorization from County provided through the Construction Manager and Architect, instruct Contractor to order such special inspection, testing, or approval, and Contractor shall give notice as in Section 13.01. If such special inspection or testing reveals a failure of the Work to comply (1) with the requirements of the Contract Documents or (2) with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, then Contractor shall bear all costs thereof, including Construction Manager's and

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Architect's additional services made necessary by such failure; otherwise County shall bear such costs, and an appropriate Change Order shall be issued.

13.03 Certificates of inspection. Required certificates of inspection, testing, or approval shall be secured by Contractor and promptly delivered by Contractor to Construction Manager for transmittal to Architect.

13.04 Observation by Construction Manager. If Construction Manager or Architect wishes to observe the inspections, tests, or approvals required by this Article 13, the Construction Manager or Architect will do so promptly and, where practicable, at the source of supply.

13.05 No waiver of Contractor's responsibility. Neither the observations of Construction Manager or Architect in administration of the construction Contract, nor inspections, tests, or approvals by persons other than Contractor shall relieve Contractor from Contractor's obligations to perform the Work in accordance with the Contract Documents.

ARTICLE 14 - CONTRACTOR'S PROSECUTION AND PROGRESS OF THE WORK

14.01 Contractor To Supervise The Work

A. Subject to those rights specifically reserved in the Contract Documents, Contractor shall supervise, direct, have control over, and be responsible for, Contractor's means, methods, techniques, sequences or procedures of construction, safety precautions and programs incident thereto, and compliance with laws and regulations applicable to the furnishing or performance of Work.

B. Contractor shall keep on the Site at all times during Work progress a competent resident Superintendent, who shall not be replaced without Owner's express written consent. The Superintendent shall be Contractor's representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent shall be as binding as if given to or by Contractor.

C. Contractor shall supervise, inspect, and direct Work competently and efficiently, devoting the attention and applying such personal skills and expertise as may be required and necessary to perform Work in accordance with Contract Documents. Contractor shall be solely responsible for and have control and charge of construction means, methods, techniques, sequences and procedures, safety precautions and programs in connection with the Work. Contractor shall be responsible to see that the completed Work complies accurately with Contract Documents.

D. Contractor is fully responsible for Contractor's own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect Contract with Contractor.

E. Contractor shall conduct monthly Contractor Safety Committee meetings, and weekly toolbox safety talks unless directed otherwise in Contract Documents.

14.02 Contractor To Maintain Cost Data.

A. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Contractor shall provide Owner with monthly summaries of this information. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, Contractor shall provide Owner with a copy of such report upon Owner's request.

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B. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on-site, Work activities, problems encountered and delays. Contractor shall provide Construction Manager with copies for each Day Contractor works on the Project, to be delivered to Construction Manager either the same Day or the following morning before starting Work at the Site. Contractor shall take pre-construction and monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.

C. Owner shall have the right to audit and copy Contractor's books and records of any type, nature or description relating to the Project (including but not limited to financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor's trailer, or other job Site office, and this requirement shall be contained in the Subcontracts of Subcontractors working on-site. By way of example, Owner shall have the right to inspect and obtain copies of all Contract Documents, planning documents, Bid proposal and negotiation documents, cost records and job cost variance reports, value engineering or other cost reduction proposals, job progress reports, photographs, and as-built Drawings maintained by Contractor. Owner and any other applicable governmental entity shall have the right to inspect and audit all information and documents maintained hereunder at any time during the Project and for the longest period of time provided in Article 36 of this Division 007100. These rights of audit and inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. These rights of audit and inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.

14.03 Contractor To Supply Sufficient Workers And Materials.

A. Unless otherwise required by Owner under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or Claims of any type.

B. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified workers to prosecute the Work as required, then Owner may require Contractor to accelerate the Work and/or furnish additional qualified workers or materials as Owner may consider necessary, at no cost to Owner. If Contractor does not comply with the notice within three (3) Business Days of date of service thereof, Owner shall have the right (but not a duty) to provide materials and qualified workers to finish the Work or any affected portion of Work, as Owner may elect. Owner may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate Work elements during the time period that Owner exercises this right. Owner will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. Owner will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of Owner from Claims of others.

C. Exercise by Owner of the rights conferred upon Owner in this subparagraph is entirely discretionary on the part of Owner. Owner shall have no duty or obligation to exercise the rights referred to in this subparagraph and its failure to exercise such rights shall not be deemed an approval of existing Work progress or a waiver or limitation of Owner's right to exercise such rights in other concurrent or future similar circumstances. (The rights conferred upon Owner under this subparagraph are, like all other such rights, cumulative to Owner's other rights under any provision of the Contract Documents.)

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14.04 Contractor To Maintain Project Record Documents.

A. Contractor shall maintain in a safe place at the Site one (1) record copy of all Drawings, Specifications, Addenda, Contract Modifications, Works, Work Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all as-built changes made during construction. These Project Record Documents, together with all approved samples and a counterpart of all approved Shop Drawings, shall be maintained and available to Owner through Construction Manager for reference. Upon completion of the Work, Contractor shall deliver to Owner through Construction Manager, the Project Record Documents, samples and Shop Drawings and as-built Drawings.

B. Throughout Contractor's performance of the Work of the Project, Contractor shall maintain construction records to include: Shop Drawings; product data/material data sheets; samples; submittal; purchases; materials; equipment; inspections; applicable handbooks; applicable codes and standards; maintenance and operating manuals and instructions; RFI Log; Submittal Log; other related documents and revisions which arise out of the Construction Contracts. Contractor shall maintain records of principal building layout lines, elevations for the bottom of footings, floor levels, and key Site elevations (certified by a qualified surveyor or professional engineer). Contractor shall make all records available to Owner through Construction Manager. At the completion of the Project, Contractor shall deliver all such records to the Owner through Construction Manager to have a complete set of record as-built Drawings.

14.05 Contractor To Not Disrupt Owner Operation.

A. Contractor shall schedule and execute all Work in a manner that does not interfere with or disrupt Owner operations, including but not limited to, parking, utilities (electricity, gas, water), noise, access by employees and administration, access by vendors, and any other person or entity using Owner facilities or doing business with Owner. Contractor shall produce and supply coordination Plans and requests to Owner through Construction Manager, following Construction Manager's procedures, for all necessary interference of construction with Owner, which Owner will reasonably cooperate with.

ARTICLE 15 TIME FOR PERFORMANCE AND LIQUIDATED DAMAGES

15.01 Time is of the essence. All time limits stated in the Contract Documents are of the essence of the Contract.

15.02 Commencement and completion of Work. Contractor shall commence the Work on the starting date established in the Notice to Proceed and shall complete the Work thereafter within the time limit established in the Project Schedule as defined in Supplementary Conditions, Section 1. If there is no Notice to Proceed, Contractor shall commence the Work on the starting date established in the Supplementary Conditions and shall complete the Work thereafter within the time limit established in the Supplementary Conditions. If there is no Notice to Proceed and if the Supplementary Conditions do not establish a starting or completion date, Contractor shall commence the Work promptly after the Agreement is executed by all parties and shall prosecute the Work regularly and diligently so as to complete the Work within a reasonable time thereafter.

15.03 Prosecution of Work. Contractor shall prosecute the Work diligently and expeditiously with adequate forces and shall complete it within the time specified in the Contract Documents.

15.04 Date of final completion. When Contractor believes that Contractor's Work is completed, he/she/it shall request that Architect and Construction Manager inspect the Work and certify its

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completion. Architect and Construction Manager will respond promptly to such a request. The date of final completion of the Work or any designated portion thereof is the date on which, after Architect and Construction Manager certify that construction has been completed in accordance with the Contract Documents, the County Board of Supervisors accepts the Work.

15.05 Grounds for extension of time. The time for completion of the Work shall be extended by Change Order for such reasonable time as Construction Manager or County may determine, if an extension of time is reasonably necessary due to a delay caused to Contractor by any of the following circumstances:
(a) Sole act or sole negligence of County, Architect, Construction Manager, any employee of either, or any separate Contractor employed by County;
(b) Any change ordered in the Work, which change is requested by County or Architect or which is not due to the act or negligence of Contractor.
(c) Any labor disputes, fire, unusual delay in transportation, unavoidable casualties, or causes beyond Contractor's control and which Contractor could not reasonably have foreseen or made reasonable provisions for, and which are not caused by or the continuance of which is not due to, any act or failure to act on behalf of Contractor; or
(d) Any other cause which Architect or Construction Manager determines may justify the delay.

15.06 Extensions of time due to failure to furnish interpretation. No extension of time shall be allowed for delay caused by Architect's failure to promptly provide an interpretation of the Contract, except in the following circumstances:
(a) Architect failed to provide the interpretation for over fifteen days after demand was made for such interpretation, and it would be reasonable to extend time due to such failure; or
(b) The parties have agreed upon a schedule for the provision of interpretations, Architect failed to comply within that schedule, and it would be reasonable to extend time due to such failure.

15.07 Inexcusable Delay. Contract Time shall not be extended for any period of time where Contractor (and/or any Subcontractor) is delayed or prevented from completing any part of the Work due to a cause that is within Contractor's risk or responsibility under the Contract Documents. Delays attributable to or within the control of a Subcontractor, or its Subcontractors, or supplier, are deemed delays within the control of Contractor.

15.08 Claims for extension of time. Notwithstanding the provisions of Section 15.05 and 15.06 above, none of the causes of delay described therein shall be deemed a valid excuse for Contractor's failure to start, perform, or complete the Work, or any portion thereof, on time unless Contractor has notified Construction Manager, in writing, of the alleged cause of delay within ten (10) days after commencement of the cause of the delay. Should Construction Manager and County disagree with Contractor that the alleged delay warrants an extension of time for the performance of any act required hereunder, Contractor shall notify Construction Manager, in writing, as provided in Article 33; provided that Contractor shall proceed with the Work during the period that Construction Manager and Contractor seek to resolve the matter.

15.09 Compensable Time Extensions.
A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Sum in addition to Contract Time for:
1. Excusable delay caused solely by Changes in the Work ordered by Owner, as provided above, and/or
2. Excusable delay caused solely by Acts or Neglect by Owner or other person, as provided above.

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15.10 Non-Compensable Time Extensions.

A. Subject to other applicable provisions of the Contract Documents, Contractor may be entitled to adjustment in Contract Time only, without adjustment in Contract Sum, for

1. Periods of excusable delay caused solely by weather or Force Majeure events as provided above in this Article, or

2. Periods of concurrent delay, where delay results from two (2) or more causes, one of which is compensable (resulting from Changes or Acts or Neglect as set forth above in this Article), and the other of which is non-compensable or unexcusable, such as: acts or neglect of Contractor, Subcontractors or others for whom Contractor is responsible; other acts, omissions and conditions which would not entitle Contractor to adjustment in Contract Time; adverse weather; and/or actions of Force Majeure as provided above in this Article.

15.11 Liquidated damages.

THE PARTIES AGREE THAT IN THE EVENT THAT ALL WORK CALLED FOR UNDER THE CONTRACT IN ALL PARTS AND REQUIREMENTS IS NOT COMPLETED WITHIN THE TIME SPECIFIED IN THE CONTRACT DOCUMENTS, DAMAGE WILL BE SUSTAINED BY COUNTY, AND THAT IT IS AND WILL BE IMPRACTICABLE AND EXTREMELY DIFFICULT TO DETERMINE THE ACTUAL DAMAGE WHICH COUNTY WILL THEREBY SUSTAIN. THE PARTIES THEREFORE AGREE THAT CONTRACTOR WILL PAY TO COUNTY THE SUM SET FORTH IN THE SUPPLEMENTARY CONDITIONS, IF ANY, FOR EACH CALENDAR DAY OF DELAY UNTIL THE WORK IS COMPLETED AND ACCEPTED. CONTRACTOR AND CONTRACTOR'S SURETY SHALL BE LIABLE FOR THE TOTAL AMOUNT THEREOF. CONTRACTOR AGREES TO PAY SAID LIQUIDATED DAMAGES ESTABLISHED HEREIN, AND FURTHER AGREES THAT COUNTY MAY DEDUCT THE AMOUNT THEREOF FROM ANY MONIES DUE OR THAT MAY BECOME DUE CONTRACTOR UNDER THE CONTRACT.

15.12 Removal or relocation of main or trunk line utility facilities. Contractor shall not be assessed for liquidated damages for delay in completion of the Project, when such delay was caused by the failure of County or a utility company to provide for removal or relocation of existing main or trunk line utility facilities. However, when Contractor is aware that removal or relocation of an existing utility has not been arranged, Contractor shall promptly notify County and the utility company, in writing, so that provision for such removal or relocation may be made to avoid and minimize any delay which might be caused by the failure to remove or relocate the main or trunk line utility facilities, or to provide for their removal or relocation. In accordance with Government Code Section 4215, if Contractor while performing the Contract discovers any existing main or trunk line utility facilities not identified by County in the Contract Plans or Specifications, Contractor shall immediately notify Construction Manager and utility in writing. The utility, where it is the owner of the facilities, shall have the sole discretion to perform repairs or relocation Work or permit Contractor to do such repairs or relocation Work at a reasonable price. Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy and for equipment on the Project necessarily idled during such Work. Such compensation shall be in accordance with the extra Work provisions set forth elsewhere in the Contract Documents. Conversely, Contractor shall not be compensated for the costs of locating, repairing damage, and removing or relocating such utility facilities which is due to the failure of Contractor to exercise reasonable care. In such an event, Contractor shall not be credited for nor given an extension of time for equipment on the project necessarily idled during such Work necessitated by Contractor's failure to exercise reasonable care.

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15.13 Partial Occupancy or Use. The County may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate Agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the County, Construction Manager, and Contractor have accepted, in writing, the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work, and insurance, and have agreed, in writing, concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of progress of the Work shall be determined by written Agreement between the County and Contractor or, if no Agreement is reached, by decision of the Architect after consultation with the Construction Manager. Immediately prior to such partial occupancy or use, the County, Construction Manager, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

ARTICLE 16 USE OF SITE

16.01 Limit of operations. Contractor shall confine his/her/its apparatus, the storage of materials, and the operations of his/her/its workers to limits indicated on the Plans, or by law, ordinances, permits, or directions of Construction Manager and shall not unreasonably occupy the premises with his/her/its materials. Insofar as possible, Contractor shall arrange his/her/its Work and its progress to prevent any interference with the operations of the existing facilities. All utilities must be protected and connections made to utilities so as not to interrupt service.

16.02 Contractor's Use Of The Site. Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any Agreement between Owner and any Owner, former Owner or tenant of such land, structure or buildings. Contractor may not occupy Owner owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior approval from Owner.

16.03 Utilities. Unless otherwise noted, all utilities, including, but not limited to, electricity, water, gas, and telephone, used on the Work shall be furnished and paid for by Contractor. Contractor shall furnish and install temporary distribution systems, including meters, if necessary, from distribution points to points on-site where utility is necessary to carry on the Work. Upon completion of the Work, Contractor shall remove all temporary distribution systems. If this Contract is for an addition to an existing facility, Contractor may, with the written permission of County, use County's existing utilities by making prearranged payments to County for utilities used by Contractor for construction.

16.04 Metering devices. For the purpose of providing utility service to the Project, Contractor may install or cause to be installed metering devices or other equipment of utility companies or of political subdivisions, title to which is commonly retained by the utility company or political subdivision. If any such metering device or equipment is installed, Contractor shall advise County as to the owner of such device or equipment.

16.05 Sanitary facilities. Contractor shall provide sanitary toilet facilities for the use of all workers and Subcontractors. The building shall be properly stocked and maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by Construction Manager. Use of the toilet facilities in the Work under construction shall not be permitted.

16.06 Field office. ***If box is checked, requirement is deleted for this Project.*** ☐
Contractor shall provide for the exclusive use of Architect, Construction Manager and County a temporary, private office of not less than 150 square feet of floor area to be located as directed by County and to be maintained until removal is authorized by County. The office shall be of substantial waterproof construction with adequate natural light and ventilation by means of stock-design windows. The door shall have a key-type lock or padlock hasp. A table satisfactory for study of Plans and two (2) chairs shall be provided by Contractor. Contractor shall provide and pay for adequate lights, heat, and air conditioning for the field office until authorized removal. See Specification Section 015000.

16.07 Telephone/Internet Access. ***If box is checked, requirement is deleted for this Project.*** ☐
Contractor shall install a working telephone and provide internet access in Architect, Construction Manager and County's office and shall maintain the same until the final completion of the Contract and the acceptance of Work. Architect and County shall have free, unrestricted use of this telephone and internet access for purposes connected with the Work. The cost of the installation and all charges for the use of the telephone and internet access shall be paid by Contractor.

16.08 Cleaning up during and after Work. Contractor, at all times, shall keep the premises free from accumulation of waste materials or rubbish caused by his/her/its operations. At the completion of the Work, Contractor shall remove all Contractor's waste materials and rubbish from and about the Project as well as all Contractor's tools, construction equipment, machinery, and surplus materials. If Contractor fails to clean up, County may do so and the cost thereof shall be charged to Contractor as provided in Section 34.03.

ARTICLE 17 MATERIALS

17.01 Quality of materials. Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of good quality. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

17.02 Provision and storage of materials. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of Work and shall be stored properly and protected as required. Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or Work under this Contract. All stored items shall be inventoried, specified by identification numbers (if applicable), released to County by sureties of Contractor, and, if stored offsite, stored only in a reputable bonded warehouse.

17.03 Substitution of materials. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name or by the name of the manufacturer, such specification shall be deemed to be used for the purpose of facilitating the description of the material, process, or article desired and shall be deemed to be followed by the words "or equal," and Contractor may, unless otherwise stated, offer any material, process, or article which shall in every respect be substantially equal to or better than that specified only with the consent of County, after evaluation by Architect, in consultation with Construction Manager, and in accordance with a Change Order or

Construction Change Directive. The burden of proof as to equality of any material, process, or article shall rest with Contractor. Contractor shall submit any request for substitution, together with any substantiating data, within thirty-five (35) days after the award of this Contract. These provisions authorizing submission of "or equal" justification data shall not in any way authorize an extension of time for performance of this Contract. In the event Contractor furnished material, processes, or articles are more expensive than those specified, the difference in cost so furnished shall be borne by Contractor. Requests for substitution of products, materials, or processes other than those specified must be accompanied by evidence whether or not the proposed substitution: (1) is equal in quality and serviceability to the specified item; (2) will entail changes in detail and construction of related Work; (3) will be acceptable in consideration of the required design and artistic effect; (4) will not provide a cost disadvantage to Architect or County. Contractor shall promptly provide, upon request, any other information that may be required of it to assist Architect, Construction Manager, and County in determining whether the proposed substitution is acceptable. The final decision shall be that of Architect in consultation with Construction Manager and County. County's and Architect's approval shall be in writing, shall follow the procedure for Change Orders, and shall be required for the use of a proposed substitute material. County may condition its approval of the substitution upon delivery to County of an extended warranty or other assurances of adequate performance of the substitution.

ARTICLE 18 CHANGES IN THE WORK

18.01 Change Orders.

A. County, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions. The Contract Sum and the Time for performance of the Work shall be adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be executed under the applicable conditions of the Contract Documents. The Contract Sum and the Time for performance of the Work may be changed only by Change Order.

B. The amount to be paid to Contractor pursuant to the Contract Documents shall, where applicable, be increased or decreased in the manner hereinafter set forth; provided however, that if Contractor should proceed with a Change in the Work upon an oral order, by whomsoever given, it shall constitute a waiver by Contractor of any Claim for an increase in the Contract Sum on account thereof. Upon receipt of said written Change Order or Written Directive, Contractor shall promptly proceed with the Change in the Work, even though the amount of any resultant increase or decrease in the Contract Sum has not yet been determined. All Changes in the Work shall be performed in accordance with the Contract Documents.

18.02 Method to calculate adjustments in Contract Sum. Determination of the method to be used to calculate adjustments in the Contract Sum shall be at the sole discretion of County. The use by Contractor of the Total Cost Method (calculating the total sum of expenses incurred on the Project, less amounts paid, marked up by overhead and profit) of pricing changes and Claims is expressly prohibited (provided however, County may use a "make whole" analysis to determine the reasonableness of Contractor's Claim). One (1) of the following methods shall be used:

A. Unit Price Method:

1. Whenever County or its representative authorizes Contractor to perform on a Unit Price basis, County's authorization shall clearly state the:

a. Scope of Work to be performed;

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b. Applicable Unit Price; and
c. Not to exceed amount of reimbursement as established by County.

2. The applicable Unit Price shall include reimbursement for all direct and indirect costs of the Work, including overhead and profit.

3. Contractor shall only be paid under this method for the actual quantity of materials incorporated in or removed from the Work and such quantities must be supported by field measurement statements verified by County.

B. Firm Fixed Price Method:

1. Contractor and County may mutually agree on a fixed amount as the total compensation for the performance of changed Work.

2. Any adjustments to the Contract Sum using the Firm Fixed Price Method shall include: all reasonable costs for labor (hours and rates), equipment, materials, overhead, and profit. Such overhead and profit shall be calculated in accordance with provision 18.04(B)(4)f.

3. Whenever County authorizes Contractor to perform changed Work on a Firm Fixed Price Method, County's authorization shall clearly state:
a. Scope of Work to be performed.
b. Total Fixed Price payment for performing such Work.

C. Time and Materials Method:

1. Whenever County authorizes Contractor to perform Work on a Time and Material basis, County's authorization shall clearly state:
a. Scope of Work to be performed;
b. A not to exceed amount of reimbursement as established by County.

2. Contractor shall:
a. Cooperate with County and assist in monitoring the Work being performed;
b. Contractor's and Subcontractors' labor hours, materials, and equipment charged to Work under the Time and Materials Method shall be substantiated by detailed time cards or logs completed on a daily basis before the close of business each Work day. Contractor shall initial each time card and/or log at the close of each Work day. Records of Contractor and Subcontractors pertaining to Work paid for on a Time and Materials method shall be maintained and available for inspection as requested by County or its representatives;
c. Perform all Work in accordance with this provision as efficiently as possible; and
d. Not exceed any cost limit(s) without County's prior written approval.

3. Contractor shall submit costs and any additional information requested by County to support Contractor's requested Contract Sum adjustment.

D. No change in the Contract Sum shall be allowed to the extent (1) Contractor's changed cost of performance is due to the fault, acts, or omissions of Contractor, or anyone for whose acts or omissions Contractor is responsible; (2) the change is concurrently caused by Contractor and County; or (3) the change is caused by an act of *Force Majeure*.

E. County shall not be responsible for, and Contractor shall not be entitled to, unallowable costs. Unallowable costs include, but are not limited to, (1) interest or attorney's fees of any type other than those mandated by California statutes, (2) Claim preparation or filing costs, (3) the cost of preparing or reviewing Change Proposals or Requests for Change Orders, (4) lost profits, lost income or earnings, (5) rescheduling costs, (6) costs for idle equipment when such equipment is not at the Site, has not been employed in the Work and is not scheduled to be used at the Site, (7) lost earnings or interest on unpaid retention, (8) Claims consulting costs, (9) the costs of corporate officers or staff visiting the Site

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or participating in meetings with County, (10) any compensation due to the fluctuation of foreign currency conversions or exchange rates, (11) loss of other business, and (12) any other special, consequential, or incidental damages incurred by Contractor or Subcontractors.

18.03 Signatures on Change Orders. A Change Order shall be in writing and shall be signed by County, Construction Manager, Contractor, and Architect. Alternatively, the Change Order may be signed by Architect alone, provided Architect has written authority from County for such procedure and that a copy of such written authority is furnished to Contractor if Contractor agrees to the adjustment in the Contract Sum or the Contract Time. Except as otherwise provided herein, the Change Order shall also be signed by Contractor in order to be effective, indicating Contractor's consent to the changes made.

18.04 Determining cost or credit for Change Order.

A. The cost or credit to County resulting from a Change in the Work shall be determined in one (1) or more of the following ways:

1. by mutual acceptance of a lump sum for Work and materials properly itemized;
2. by Unit Prices stated in the Contract Documents or subsequently agreed upon; or
3. as provided in Subsection 18.04(B).

B. All parties to the Agreement shall observe the following procedures for all Change Proposals and shall require all Subcontractors to follow the same procedures:

1. Each Change Proposal will carry a unique identifying number, such as C-001, A-001 or O-001 which identifies the originator, i.e. C = Contractor, A = Architect, O = Owner and a chronological serial number. All correspondence referring to that Change Order, no matter who originates the correspondence, shall refer to the same identifying number. Any Change Proposal without such number shall be returned to the originator.
2. The items of Work involved shall be identified by specific reference to Drawing and detail number and Specification Section if possible.
3. The quantities of material or other Work involved will be identified along with the costs thereof. The items of Work shall be arrayed in a manner that is consistent with the Construction Specifications Institute (CSI) forty-eight (48) division uniform system for classifying construction activities used for the schedule of values for each Project component.
4. The total cost of a Change Proposal shall be limited to the following elements of cost, overhead, and profit:
   a. Labor - For all labor, including foreman supervision, but excluding general superintendents, as may be necessary, Contractor shall be reimbursed for labor costs as provided herein. The labor cost of a change in the Work shall be calculated as the sum of the following.
      i. Wages of labor on Contractor’s payroll, including foreman, directly engaged in the Work; hourly rates for each classification of worker shall be identified;
      ii. Engineering and drafting performed;
      iii. Fringe benefits established by the governing trade organizations;
      iv. Federal Insurance Contributions Act costs and Federal and State Unemployment Taxes;
      v. Net actual premium change for Commercial Liability, Workers' Compensation, Property Damage, and any other forms of Insurance.
   b. Materials – The cost of materials resulting from a change in the Work shall be calculated in one (1) or more of the following methods, at County’s election:
      i. Invoice Cost – Contractor may be paid the actual invoice cost of materials including actual freight and express charges and applicable taxes less all available discounts, rebates, and back charges, notwithstanding the fact that available discounts, rebates and back charges may not

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have been provided to Contractor. This method shall be considered only to the extent Contractor's invoice costs are reasonable and Contractor provides copies of vendor invoices, freight and express bills, and other evidence of cost accounting and payment satisfactory to County. As to materials furnished from Contractor's stocks for which an invoice is not available, Contractor shall furnish an affidavit certifying its actual cost of such materials and such other information as County may reasonably require;

ii. Wholesale Price - Contractor may be paid the lowest current wholesale price for which the materials are available in the quantities required, including customary costs of delivery and all applicable taxes less all available discounts, rebates, and back charges; or,

iii. County-Furnished Materials - County reserves the right to furnish such materials as it deems advisable; Contractor shall have no Claim for costs, overhead, or profit on such materials.

c. Equipment – The additional cost, if any, of machine-power tools and equipment usage shall be calculated in accordance with the following:

i. Equipment Rates - Contractor's own charge rates may be used if verified and approved by County and based on Contractor's actual ownership and operating cost experience. Rental rates contained in published rate guides may be used if their cost formulas and rate factors are identifiable, reflect Contractor's historical acquisition cost, utilization, and useful life, and do not include replacement cost, escalation contingency reserves, general and administrative expense, or profit. Rates shall be based on Contractor's actual allowable costs incurred or the rates established according to the Rental Rate Blue Book for Construction Equipment, published by Machinery Information Division of PRIMEDIA, whichever is less. The Rental Rate Blue Book established rate shall be the monthly rate for the equipment plus the monthly rate for required attachments, divided by one hundred and seventy-six (176), plus the hourly operating cost, multiplied by the appropriate area adjustment factor if appropriate. The rates shall apply for actual equipment usage up to eight (8) hours per day. For all hours in excess of eight (8) hours per day or one hundred and seventy-six (176) hours per month, the established monthly rate shall be divided by three hundred and fifty-two (352), plus the hourly operating cost, multiplied by the area adjustment factor, if appropriate.

ii. Transportation - If necessary equipment is not already at the Site and it is not anticipated that if would be required for the performance of other Work under the terms of the Contract, the calculation shall include a reasonable amount for the costs of the necessary transportation of such equipment.

iii. Standby - Contractor shall only be entitled to standby equipment costs if (a) the equipment is ready, able, and available to do the Work at a moment's notice; (b) Contractor is required to have equipment standby because of an event or condition solely caused by County; and (c) Contractor can demonstrate that it could have and intended to use the equipment on other Projects or jobs. Contractor shall be compensated at fifty percent (50%) of the adjusted hourly rate identified in the Rental Rate Blue Book for Construction Equipment, published by Machinery Information Division of K-111 Directory Corp. Standby shall not be paid during periods of Contractor caused delay, concurrent delay, unusually severe weather conditions, during any seasonal shutdown, routine maintenance, downtime, or occurrence specified in the Contract Documents. No payment shall be made for a twenty-four (24) hour period. Standby costs shall not be paid for weekends, holidays, and any time the equipment was not intended to be used on the Project as demonstrated by the Project Schedule.

d. Subcontractor's Cost - The Subcontractor's cost of Work shall be calculated and itemized in the same manner as prescribed herein for Contractor.

e. Bonds - Itemized statement of changes in costs of Bonds.

f. Markup - Allowed markup for Change Order Work shall not exceed the following two (2) items:

i. ten percent (10%) combined overhead and profit markup for Contractor performing the

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actual Change Order Work and,

ii. five percent (5%) combined overhead and profit markup on the direct costs for Contractor's markup of Subcontractor Work. In no event shall the total combined overhead and profit markup for Contractor and all intermediate tier Subcontractors and suppliers exceed fifteen percent (15%) of the direct cost to perform the Change Order Work. Direct costs shall include Labor (as defined in provision 18.04(B)(4)a, Materials (as defined in provision 18.04(B)(4)b, Equipment (as defined in provision 18.04(B)(4)c, Subcontractor Costs (as defined in provision 18.04(B)(4)d, Bond (as defined in provision 18.04(B)(4)e. All other costs shall be deemed overhead costs. Profit markup shall be allowed on delay, acceleration, unabsorbed overhead, or any other asserted impact costs.

g. Taxes - Taxes required to be paid by Contractor, but not included above.

C. Invoices or quotes shall accompany Change Proposals from vendors. Change Proposals shall be sent to Architect and Construction Manager, in duplicate, who shall maintain a database of all proposals which can readily determine the location and status of the change request. Change Proposals shall include all cost backup, including breakdown of hours expended by jobsite personnel per task with or without overall execution of the Work. Lump sum Change Proposals lacking necessary backup, as determined by County, will not be accepted or approved.

D. All Change Proposals shall be checked by Architect and Construction Manager for accuracy and fairness. Should Contractor utilize Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) or National Electrical Contractors Association (NECA) cost estimating standards, they will use seventy percent (70%) of the most favorable labor productivity rates.

E. When the final costs are agreed upon by County, Construction Manager, Contractor, and Architect, a Change Order will be prepared by County for signature by County, Construction Manager, Contractor, and Architect. The Change Order shall be the record document defining the costs and time extensions, if any, of the required and agreed-to change in the Work. A Change Order calculated in accordance with the provisions of this Agreement shall be full and complete compensation and final settlement of all changes and Claims for all (a) time; (b) direct, indirect, and overhead costs; (c) profit; and (d) any and all costs or damages associated with delay, inconvenience, disruption of schedule, impact, ripple effect, loss of efficiency or productivity, acceleration of Work, lost profits, and/or any other costs or damages related to any Work either covered or affected by the changed Work, or related to the events giving rise to the change.

F. Contractor shall keep present, in the American Institute of Architects' format, an itemized accounting together with appropriate supporting data. Pending final determination of cost to County, payments on account shall be made on Contractor's certificate for payment. The amount of credit to be allowed by Contractor to County for any deletion or change which results in a net decrease in cost will be the amount of the actual net decrease as confirmed by Architect and Construction Manager. When both additions and credits are involved in any one (1) change, the allowance for overhead and profit shall be figured on the basis of net increase, if any.

G. If no Agreement can be reached on changes in the Work or costs, or Contractor refuses to accept a Change Order, County may issue the Change Order unilaterally. Contractor shall comply with the requirements of the Change Order. County shall provide for an equitable adjustment to the Contract Sum and compensate Contractor accordingly. If Contractor does not agree that the adjustment is equitable, it may submit a Claim in accordance with Article 33. If Contractor refuses to comply with the Change Order, County may have the Work done by another Contractor or its own forces.

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18.05 Changes requiring an increase in Contract Sum.
A. If County elects to have the Change in the Work performed on a lump sum basis, its election shall be based on a lump sum proposal which shall be submitted by Contractor to County within five (5) Work days of County's request. County's request for a lump sum proposal shall not be deemed an election by County to have the Change in the Work performed on a lump sum basis.

B. If County elects to have the Change in the Work performed on a unit cost basis, its election shall be based on a Unit Price proposal which shall be submitted by Contractor to County within five (5) Work days of County's request. County's request for a Unit Price proposal shall not be deemed an election by County to have Change in the Work performed on a Unit Price basis.

C. If County elects to have the Change in the Work performed on a time and materials basis, the same shall be performed, its election shall be based on a time and materials price proposal which shall be submitted by Contractor within five (5) Work days of County's request. County's request for a time and materials price proposal shall not be deemed an election by County to have the Change in the Work performed on a time and materials basis.

D. Nothing herein contained shall preclude County from requesting a lump sum proposal, a Unit Price proposal, and a time and materials price proposal, or any two (2) of those, with respect to the same Change in the Work, in which event, Contractor shall submit all proposals requested.

E. Until such time as County makes its election under this Section, Contractor shall submit daily time and materials tickets to County as required under subparagraph (C) and Section 18.04(B), which shall be subject to authentication as therein provided. At such time as County makes its election under this Section, an appropriate Change Order will be issued; provided however, that until such time, County shall pay to Contractor up to County's reasonable estimated value of the Change in the Work.

F. Contractor's proposal shall be in compliance with Sections 18.02, 18.03, and 18.04 of the General Conditions.

18.06 Changes requiring a decrease in Contract Sum. If the Change in the Work will result in a decrease in the Contract Sum, County may request a quotation by Contractor of the amount of such decrease for use in preparing a Change Order. Contractor's quotation shall be forwarded to County within five (5) days of County's request and, if acceptable to County, shall be incorporated in the Change Order. If not acceptable, the parties shall make every reasonable effort to agree as to the amount of such decrease, which may be based on a lump sum properly itemized, on Unit Prices stated in the Contract Documents and/or on such other basis as the parties may mutually determine. If the parties are unable to so agree, the amount of such decrease shall be the total of the estimated reduction in actual cost of the Work, as determined by County in its reasonable judgment, plus ten percent (10%) thereof as overhead and profit. Contractor's proposal shall be in compliance with Sections 18.02, 18.03, and 18.04 of the General Conditions.

18.07 Changes affecting Contract Time. If Change in the Work will result in an extension or contraction of the Contract Time, and the parties are unable to agree as to number of days by which the Contract Time will be extended or contracted, County shall not be required to make its determination until the Work has been completed, at which time its determination shall be based on a review of Contractor's books and records relating to the time involved in performing the Change in the Work and on County's judgment as to whether Contractor diligently performed the same.

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18.08 Disputes regarding changes. If any dispute should arise between the parties with respect to an increase or decrease in the Contract Sum or an expansion or contraction in the Contract Time as a result of a Change in the Work, Contractor shall not suspend performance of a Change in the Work or the Work itself unless otherwise so ordered by County in writing. County shall, however, pay to Contractor up to County's reasonable estimate of the value of the Change in the Work, regardless of the dispute, if said Change in the Work results in an increase in the Contract Sum; and County shall have the right to decrease the Contract Sum to County's reasonable estimated value of the Change in the Work, regardless of the dispute, if said Change in the Work results in a decrease in the Contract Sum.

18.09 Adjustment of Unit Prices. If Unit Prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed Unit Prices to the quantities of Work proposed will create a hardship on County or Contractor, the applicable Unit Prices shall be equitably adjusted to prevent such hardship.

18.10 Claims for additional cost. All Claims for additional compensation or for an increase in the Contract Sum shall be made as provided in Article 33. Any change in the Contract Sum resulting from such Claim shall be authorized by Change Order.

18.11 Minor changes in the Work. Subject to approval by County, Architect may order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes may be made by other written order issued through the Construction Manager. Such changes shall be binding on County and Contractor.

18.12 Limitations. Except as expressly provided by this Section, there shall be no change whatsoever in the Plans and Specifications and in the Work. Contractor shall not vary the Work, the Contract Documents, or change, add to, or omit any element, component part, or portion of the Work without the express written consent of Construction Manager or Architect contained in an executed Change Order or Field Order as herein provided. County shall not be liable for the cost for any extra Work or any substitutions, changes, additions, omissions, or deviations from the Plans and Specifications unless the same have been authorized by and the cost thereof approved in writing by Change Order. No extension of time for performance of the Work shall be allowed hereunder unless Claim for such extension shall be made at the time changes in the Work are ordered and such duly adjusted in writing by Construction Manager and Architect. Contractor recognizes and acknowledges that timely completion of the Work is paramount and that its duty is to proceed with the Work in accordance with the Contract Documents, notwithstanding any request for change in the Work, to the extent that proceeding is reasonable and feasible under the circumstances.

18.13 Review of Contract Documents. Execution of the Contract by the Contractor is a representation that the Contractor has visited the Site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. Contractor shall carefully study and compare the Contract Documents including, but not limited to, the Agreement, General Conditions, Drawings, Specifications, Addenda, and modifications, and shall at once report to Architect and Construction Manager any error, inconsistency, or omission it may discover. Contractor shall not work without proper Drawings and Specifications or interpretations. If Contractor performs any construction activity knowing it involves a recognized error, inconsistency, or omission in the Contract Documents without such notice to Architect and

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Construction Manager, Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the costs attributable for correction.

18.14 Requests for Information. Contractor shall review all Requests for Information (RFI), or other Contractor or Subcontractor initiated RFI, prior to submission to Construction Manager to ensure that the information requested in such RFI is not already provided in the Contract Documents. RFI submittals shall come only from Contractor (not from any Subcontractors). Contractor shall prepare RFI on an RFI form approved by the Construction Manager, which shall include a detailed description of the conditions, cause, and/or reason for the request. RFI shall also include a proposed resolution. All RFI shall reference the applicable Construction Documents. A transmittal letter over a subcontractor's RFI does not constitute an approved form. The Construction Manager will receive and review RFI from the Contractor, and forward each RFI to the Architect and County, with the Construction Manager's recommendations. The Architect and County will review and respond, in writing, to the Construction Manager to RFI about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made, in writing, within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the RFI.

ARTICLE 19 UNCOVERING AND CORRECTION OF WORK

19.01 Uncovering of Work.
(a) If any Work is covered contrary to the request of the Architect or Construction Manager, it must be uncovered for the Architect's or the Construction Manager's observation and replaced at the Contractor's expense.
(b) Architect or Construction Manager may ask to see any other Work that has been covered prior to its inspection by Architect or Construction Manager, and Contractor shall uncover the Work. If such Work is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to County. If such Work performed by Contractor or Contractor's Subcontractor is found not to be in accordance with the Contract Documents, Contractor shall pay such costs unless it is found that a separate Contractor which is not Contractor's Subcontractor caused this condition, and, in that event, that separate Contractor shall be responsible for the payment of costs to uncover and replace the Work.

19.02 Correction of Work.
(a) Contractor shall promptly correct all Work rejected or otherwise determined by Construction Manager, Architect or Owner to be defective whether observed before or after Final Completion and whether or not fabricated, installed, or completed.
(b) In addition to the Contractor's obligation under Article 35, if, within one (1) year after the date of Final Completion of the Work or (if applicable) designated portion thereof, or after the date for commencement of warranties established under Article 35, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be defective, the Contractor shall correct it promptly after receipt of written notice from the County to do so unless the County has previously given the Contractor a written acceptance of such condition. The County shall give such notice promptly after discovery of the condition. If, during the applicable correction period, the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the County waives the rights to require correction by the Contractor and to make a Claim for breach of warranty.
(c) The one (1) year correction period shall be extended with respect to portions of Work first performed after Final Completion, and for Defective Work which is not promptly corrected pursuant to this Section 19.02 by the period of time between Final Completion and the actual completion or

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correction of that portion of the Work. The one (1) year period for correction of Work shall not be extended for Defective Work which is promptly corrected by the Contractor pursuant to this Section 19.02.
(d) Contractor shall bear all cost of correcting Defective Work, including the cost of Construction Manager's and Architect's additional services made necessary thereby, whether before or after Final Completion.
(e) All Defective Work shall be removed from the Site if necessary, and the Work shall be corrected to comply with the Contract Documents without cost to County.
(f) Contractor shall bear the cost of making good all Work of Contractor, Contractor's Subcontractors and separate Contractors or existing facilities destroyed or damaged by such removal or correction, whether before or after Final Completion.

19.03 Contractor's failure to remove Defective Work. If Contractor does not remove such defective or nonconforming Work within a reasonable time fixed by written notice from Construction Manager, County may remove it and may store the materials or equipment at the expense of Contractor. If Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, County may upon ten (10) additional days written notice sell such Work at auction or a private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by Contractor, including compensation for additional architectural services. If such proceeds of sale do not cover all costs, which Contractor should have borne, the difference shall be charged to Contractor and an appropriate Change Order shall be issued. Such Change Order shall not require Contractor's consent to be effective. Said amount may be deducted from any payment thereafter due to Contractor under this or any other Contract with County. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to County.

19.04 Contractor's failure to correct Defective Work. If Contractor fails to correct such defective or nonconforming Work, County may correct it in accordance with Section 34.03.

19.05 Acceptance of defective or nonconforming Work. If County prefers to accept defective or nonconforming Work, it may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect an appropriate reduction in the Contract Sum, or, if the amount is determined after final payment, it shall be paid by Contractor. The issuance of the final certificate, final payment, or any provisions in the Contract Documents shall not relieve Contractor of responsibility for faulty materials, equipment, or workmanship. Contractor shall remedy any defects due to, and pay for any damage to, other Work in accordance with the applicable guaranty or warranty provisions of the Contract Documents.

19.06 Emergency corrective action by County. If, in the opinion of County, Defective Work creates a dangerous condition or requires immediate correction or attention to prevent further loss to County or third parties or to prevent interruption of operations of County or third parties, County will attempt to give notice to Contractor. If Contractor cannot be contacted promptly or does not comply with County's request for correction within a reasonable time as determined by County, County may, notwithstanding the provisions of this Contract, proceed to make such correction or provide such attention, and the costs of such correction or attention shall be charged against Contractor. Such action by County shall not relieve Contractor of any warranty obligations provided in this Contract.

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PART III SAFETY

ARTICLE 20 PROTECTION OF PERSONS AND PROPERTY

20.01 Contractor's responsibility for safety. Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to:
(a) All employees on the Work and all other persons who may be affected thereby;
(b) All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site, under the care, custody, or control of Contractor or any Subcontractor; and
(c) 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.

20.02 Environmental Controls. Contractor shall comply with all rules, regulations, ordinances, and statutes that apply to any Work performed under the Contract Documents including, without limitation, any toxic, water, stormwater management and soil pollution controls and air pollution controls specified in California Government Code Section 11017. Contractor shall be responsible for insuring that Contractor's Employees, Subcontractors, and the public are protected from exposure to airborne hazards or contaminated water, soil, or other toxic materials used during or generated by activities on the Site or associated with the Project.

20.03 Compliance with safety requirements. Contractor shall comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. He/she/it shall erect and maintain, as required by existing conditions and 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 owners and users of adjacent utilities.

20.04 Contractor To Locate Underground Facilities.
A. During construction, Contractor shall comply with Government Code Sections 4216 through 4216.9, and in particular Section 4216.2 which provides, in part: "Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two (2) working days, but no more than fourteen (14) calendar days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation."
B. Contractor shall contact Underground Service Alert (USA), and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching Work, Contractor shall provide Owner with copies of all USA records secured by Contractor. Contractor shall advise Owner of any conflict between information provided in Geotechnical Data and Existing Conditions, the Drawings and that provided by USA records. Contractor's excavation shall be subject to and comply with the Contract Documents.

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C. Contractor shall also investigate the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site, even if not shown or indicated in Geotechnical Data and Existing Conditions, the Drawings or that provided by USA records. Contractor shall immediately secure all such available information and notify Owner and the utility owner, in writing, of its discovery.

20.05 Contractor To Protect Underground Facilities.

A. At all times during construction, all operating Underground Facilities shall remain in operation, unless the Contract Documents expressly indicate otherwise. Contractor shall maintain such Underground Facilities in service where appropriate; shall repair any damage to them caused by the Work; and shall incorporate them into the Work, including reasonable adjustments to the design location (including minor relocations) of the existing or new installations. Contractor shall take immediate action to restore any in service installations damaged by Contractor's operations.

B. Prior to performing Work at the Site, Contractor shall lay out the locations of Underground Facilities that are to remain in service and other significant known underground installations indicated by the Underground Facilities Data. Contractor shall further locate, by carefully excavating with small equipment, potholing and principally by hand, all such utilities or installations that are to remain and that are subject to damage. If additional utilities whose locations are unknown are discovered, Contractor shall immediately report to Owner for disposition of the same. Additional compensation or extension of time on account of utilities not shown or otherwise brought to Contractor's attention, including reasonable action taken to protect or repair damage, shall be determined as provided in this Division 007100.

C. If during construction, an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by Owner for bidding or in information on file at USA or otherwise reasonably available to Contractor, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven [7] Days), and prior to performing any Work in connection therewith (except in an emergency), identify the owner of such Underground Facility and give written notice to that owner and to Owner. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. The cost of all of the following will be included in the Contract Sum and Contractor shall have full responsibility for (a) reviewing and checking all available information and data including, but not limited to, information made available for bidding and information on file at USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents, available information, or indicated by visual observation including, but not limited to, and by way of example only, engaging qualified locating services and all necessary backhoeing and potholing; (c) coordination of the Work with the owners of such Underground Facilities during construction; and (d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

E. Consistent with California Government Code Section 4215, as between Owner and Contractor, Owner will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or information made available for bidding. Owner will compensate for the cost of locating and repairing damage not due to Contractor's failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or information made available for bidding with reasonable accuracy, and equipment on the Project necessarily idled during such Work. Contractor shall not be assessed liquidated damages for delay in completion of the Project, when such delay was caused by the failure of Owner or the utility to provide for removal or relocation of such utility facilities.

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20.06 Concealed Or Unknown Conditions.

A. If either of the following conditions is encountered at Site when digging trenches or other excavations that extend deeper than four (4) feet below the surface, Contractor shall give a written Notice of Differing Site Conditions to Owner promptly before conditions are disturbed, except in an emergency as set forth in this Division 007100, and in no event later than seven (7) Days after first observance of:

1. Subsurface or latent physical conditions which differ materially from those indicated in the Contract Documents; or
2. Unknown physical conditions of an unusual nature or which differ materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.

B. In response to Contractor's Notice of Differing Site Conditions under this Section, Owner will investigate the identified conditions, and if they differ materially and cause increase or decrease in Contractor's cost of, or time required for, performance of any part of the Work, Owner will negotiate the appropriate Change Order following the procedures set forth in the Contract Documents. If Owner determines that physical conditions at the Site are not latent or are not materially different from those indicated in Contract Documents or that no change in terms of the Contract Documents is justified, Owner will so notify Contractor in writing, stating reasons.

C. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed latent or materially different Site conditions (whether above or below grade) if Contractor knew or should have known of the existence of such conditions at the time Contractor submitted its Bid, failed to give proper notice, or relied upon information, conclusions, opinions or deductions of the kind that the Contract Documents preclude reliance upon.

D. Regarding Underground Facilities, Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that is owned and was built by Owner only where the Underground Facility:

1. Was not shown or indicated in the Contract Documents or in the information supplied for bidding purposes or in information on file at USA; and
2. Contractor did not know of it; and
3. Contractor could not reasonably have been expected to be aware of it or to have anticipated it from the information available. (For example, if surface conditions such as pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, then an increase in the Contract Sum or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated in the Contract Documents, in the information supplied to Contractor for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor.)

E. Contractor shall bear the risk that Underground Facilities not owned or built by Owner may differ in nature or locations shown in information made available by Owner for bidding purposes, in information on file at USA, or otherwise reasonably available to Contractor. Underground Facilities are inherent in construction involving digging of trenches or other excavations on Owner's Project, and Contractor is to apply its skill and industry to verify the information available.

F. Contractor's compensation for claimed latent or materially different Site conditions shall be limited to the actual, reasonable, incremental increase in cost of that portion of the Work, resulting from the claimed latent or materially different Site conditions. Such calculation shall take into account the estimated value of that portion of the Work and the actual value of that portion of the Work, using for guidance Contractor's or its Subcontractor's bid amount and actual amounts incurred for that portion of the Work and the reasonable expectation (if any) of differing or difficult site conditions in the Work area based on the available records and locale of the Work. For example, if Contractor excavates in an area unexpected, then such costs would be recoverable entirely; while if Contractor

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extends an existing excavation, then such costs would be recoverable if the resulting excavation costs in that Work area exceeded the reasonable expectations therefore.

20.07 Trench safety. For all trenches to be made in connection with the Work, Contractor shall submit a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trenches. If such plan varies from the shoring system standards, a registered civil or structural engineer shall prepare the plan. The plan shall be reviewed, and must receive approval as adequate to protect worker safety, by County or by a registered civil or structural engineer employed by County, in advance of excavation. The shoring, sloping, or protective system must be at least as effective as that required by the Construction Safety Orders and in accordance with California Labor Code Section 6705.

20.08 Hazardous substance. The term "hazardous substance" means any substance on the list of hazardous substances established by the Director of Industrial Relations pursuant to the Labor Code Section 6382, which includes asbestos, lead, toxic chemicals, contaminants, any substance designated by the Environmental Protection Agency as a hazardous substance, and other pollutants and contaminants.
(a) If Contractor encounters on the property any substance reasonably believed to be a Hazardous Substance that has not been rendered harmless, i.e., not potentially hazardous to human health, Contractor shall immediately stop Work in the area affected and report the condition to County, Construction Manager and Architect in writing.
(b) Neither Contractor nor any Subcontractor shall cause or permit any Hazardous Substance to be brought upon the property or used in the Work without the prior written consent of County. Contractor and each Subcontractor shall comply with all laws regarding the handling, treatment, presence, removal, storage, decontamination, cleanup, transportation, or disposal of Hazardous Substances brought onto the property by Contractor, its Subcontractors, and/or their personnel.
(c) Any handling, treatment, removal, decontamination, cleanup, transportation, disposal, or disturbance in any of Hazardous Substances shall only be performed by Contractor or any Subcontractor licensed and certified to perform the Work. Any hazardous substance abatement or remediation Work will be performed in such a way that is legally consistent with the recommendations of the certified County agent, appropriate governmental agencies, and all applicable laws.
(d) If there is a Hazardous Substance on the property, Contractor shall protect adjoining property and provide barricades, temporary fences, and covered walkways required to protect the health and safety of passersby as required by this Agreement, prudent construction practices, and all applicable laws.

20.09 Contractor's safety monitor. Contractor shall designate a responsible member of Contractor’s organization at the site whose duty shall be the prevention of accidents. This person shall be Contractor's Superintendent unless otherwise designated in writing by Contractor to County, Construction Manager, and Architect.

20.10 Unsafe loading. Contractor shall not load nor permit any part of any structure or pavement to be loaded in any manner that will endanger the structure or pavement, nor shall Contractor subject any part of Work or adjacent property to stresses or pressures that will endanger it. Contractor shall conduct all necessary existing conditions investigations regarding structural, mechanical, electrical or any other existing systems, shall perform Work consistent with such existing conditions, and shall have full responsibility for insufficiencies or damage resulting from insufficiencies of existing systems, equipment or structures to accommodate performing the Work.

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20.11 Emergencies. In any emergency affecting the safety of persons or property, Contractor shall act, at his/her/its discretion, to prevent threatened damage, injury, or loss. Any additional compensation or extension of time claimed by Contractor on account of emergency Work shall be determined as provided in Article 18 – Changes in the Work.

20.12 Accidents. Contractor shall promptly report, in writing, to Architect, Construction Manager, and County all accidents whatsoever arising out of, or in connection with the performance of the Work, whether on or off the Site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, Contractor shall report the accident immediately to Construction Manager by telephone or messenger. Contractor shall thereafter promptly report the facts, in writing, to Architect, Construction Manager, and County giving full details of the accident.

PART IV PAYMENTS

ARTICLE 21 PROGRESS PAYMENTS

21.01 Monthly progress payments. Monthly progress payments shall be made to Contractor, as provided in this Article.

21.02 Schedule of values. Before Contractor submits any application for payment, Contractor shall submit to Construction Manager and Architect a schedule of values of the various portions of the Work, to be used to enable County to estimate the timing and amounts of the successive progress payments. If required by Construction Manager, the schedule shall include quantities aggregating the total Contract Sum, divided so as to show Contractor's anticipated payments to Subcontractors. The schedule shall be prepared in such form as may be specified in the Contract Documents or by Construction Manager, or as may be agreed upon by Construction Manager and Contractor. The schedule shall include such data as Construction Manager and Architect may require substantiating its correctness. Each item in the schedule shall include its proper share of overhead and profit. This schedule, when approved by Construction Manager, shall be used only for preparing and reviewing Contractor's applications for payment, and will not be considered as fixing a basis for additions to or deductions from the Contract Sum.

21.03 Application for payment. On or before the fifth day of each month, Contractor shall submit to Construction Manager an application for payment including a schedule of values, requesting payment for the Work completed up to the end of that same month, using the standard AIA form for requesting progress payments or such other form as may be prescribed by County. The application shall be itemized by task and shall be supported by such data substantiating Contractor's right to payment as County, Architect or Construction Manager may require.

21.04 Payment for stored materials and equipment. If payments are to be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the Site, or at some other location agreed upon in writing, such payments shall be conditioned upon submission by Contractor of bills of sale or such other procedures satisfactory to County to establish County's title to such materials or equipment or otherwise protect County's interest including applicable insurance and transportation to the Site.

21.05 Certificates for payment. If Contractor has made application for payment as set forth above, Construction Manager will, with reasonable promptness but not more than ten (10) days after the

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receipt of the application, issue a certificate for payment to County, with a copy to Contractor, for such amount as Construction Manager determines to be properly due, or state in writing the reasons for withholding a certificate as provided in Section 22.01. A payment request determined not to be a proper payment request suitable for payment will be returned to Contractor within seven (7) days with a statement setting forth the reasons why the payment request is not proper. Payments shall be made on demands drawn in the manner required by law, accompanied by a certificate signed by Project Manager, stating the Work for which payment is demanded has been performed in accordance with the terms of the Contract. Contractor is entitled to interest pursuant to Public Contract Code Section 20104.50 if County fails to make the progress payment within thirty (30) days after County Auditor Controller's receipt of an undisputed properly submitted payment request.

21.06 Findings to issue certificate of payment. In determining to issue a certificate of payment, Construction Manager and Architect must make the following findings, based on observations at the Site, the schedule of values, and the data included in the application for payment:
(a) that the Work has progressed to the point indicated;
(b) that, to the best of their knowledge, information, and belief, the quality 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, to the results of any subsequent tests required by the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in his/her/its certificate); and
(c) that Contractor is entitled to payment in the amount certified.

21.07 Amount of progress payment. The amount of each progress payment shall equal ninety-five percent (95%) of the estimated value of Work performed up through the last day of the previous month, less the aggregate of all previous payments. The amount of the progress payment may be further reduced by any withholdings or deductions that may be taken from the payment pursuant to other provisions of this Contract. For the purpose of determining the amount of any particular progress payment, the value of Work completed is only an estimate; such value or estimate shall be used for no other purpose in connection with this Contract and shall not be binding on County Architect or Construction Manager for any other purpose or any other payment, and County, Architect and Construction Manager shall have the right to correct any error in such value or estimate for later payments.

21.08 Payment by County. Promptly after Construction Manager has issued a certificate for payment, County shall submit the appropriate documentation to the Monterey County Auditor-Controller, who shall make payment to Contractor within thirty (30) days thereafter. All materials and Work covered by payments made shall thereupon become the sole property of County, and this provision shall not be construed as relieving Contractor from the continuing responsibility for all materials and Work upon which payments have been made or the restoration of any damaged Work, or as a waiver of any right of County to require the fulfillment of all terms of this Agreement. Title to all Work completed in the course of construction and to all materials, including the Specifications and other documents prepared by Architect, Construction Manager, and/or Contractor on account of which payment has been made shall be vested in County.

21.09 Limited effect of issuance of certificate or progress payment. By issuing a certificate for payment, Construction Manager and Architect 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 or that they have reviewed the construction means, methods, techniques, sequences, or procedures, or that they have made any examination to ascertain how or for what purpose Contractor has used the monies

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previously paid on account of the Contract Sum. Further, no certificate for a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by County, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

ARTICLE 22 WITHHOLDING PAYMENTS

22.01 Grounds for withholding payment. The Architect or Construction Manager may decline to approve an application for payment and may withhold his/her certificate for payment as to all or part of the payment amount requested, to the extent reasonably necessary to protect County, if in the Architect's or Construction Manager's opinion he/she is not able to make the findings set forth in Section 21.06. Architect or Construction Manager may also decline to approve payment, in whole or in part, and, based on subsequently discovered evidence or subsequent inspections, Architect or Construction Manager may nullify the whole or any part of any certificate for payment previously issued, to such extent as may be necessary in the Architect's or Construction Manager's opinion to protect County. Such withholding of the certificate or of any amounts requested by Contractor in connection with the certificate, may be based on any of the following grounds:

(a) Defective Work not remedied;
(b) third-party Claims filed or reasonable evidence indicating probable filing of such Claim;
(c) failure of Contractor to make payments properly to Subcontractors or for labor, materials, or equipment;
(d) reasonable doubt that the Work can be completed for the unpaid balance of the Contract Sum;
(e) damage to another Contractor;
(f) reasonable indication that the Work will not be completed within the Contract Time;
(g) unsatisfactory prosecution of the Work by Contractor;
(h) stop notices filed for any portion of the Work;
(i) failure or refusal of Contractor to fully comply with the Contract requirements; or
(j) Contractor's failure to comply within a reasonable time with Article 20 of these conditions.

22.02 Application of withheld amounts. County may apply any such withheld amounts to payment of such Claims or obligations, in County's sole discretion. In so doing, County shall be deemed the agent of Contractor and any payment so made by County shall be considered as a payment made under Contract by County to Contractor. County shall not be liable to Contractor for any such payments made in good faith. Such payments may be made without prior judicial determination of such Claim or obligation. County will render to Contractor a proper accounting of any funds so disbursed on behalf of Contractor.

22.03 Payment when grounds removed. When the above grounds for withholding payment are removed by Contractor or by County, payment of the withheld amounts or the remaining balance thereof shall be made to Contractor.

ARTICLE 23 COMPLETION AND FINAL PAYMENT

23.01 Substantial Completion.

A. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

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B. Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work, or designated portion thereof, is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the requirements of the Contract Documents so that the Owner can occupy or utilize the Work, or designated portion thereof, for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.

C. When the Architect, assisted by the Construction Manager, determines that the Work, or designated portion thereof, is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute, a Certificate of Substantial Completion that shall establish the date of Substantial Completion; shall establish responsibilities of the County and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Final Completion of the Work, or designated portion thereof, unless otherwise provided in the Certificate of Substantial Completion.

D. The Certificate of Substantial Completion shall be submitted to the County and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

23.02 Application for final payment. When the Work is complete, Contractor shall submit to Construction Manager the following documents:
(a) a written notice that the Work is ready for final inspection;
(b) an application for final payment;
(c) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which County might in any way be responsible, have been paid or otherwise satisfied;
(d) consent of the sureties, if any, to final payment; and
(e) if required by County, other proof (such as receipts, releases, and waivers of liens) establishing payment or satisfaction of all obligations arising out of the Contract, to the extent and in such form as may be designated by County.

23.03 Bond for outstanding Claims or liens. If any person refuses to furnish a release or waiver required by County, Contractor may furnish a Bond satisfactory to County to indemnify and defend County against any Claim that might be made against County or any lien that might be placed against the Work on account of such person. If any such Claim or lien remains unsatisfied after all payments are made, Contractor or the Surety shall pay to County all monies that County may be compelled to pay in discharging such Claim or lien, including all costs and reasonable attorneys' fees.

23.04 Inspection and final certificate. Upon receipt of the application for final payment and documents required per Section 23.02, Architect and Construction Manager will promptly inspect the Work. Architect and Construction Manager shall issue a certificate for final payment, with copies to both County and Contractor, if they make the following findings:
(a) that the Work is acceptable under the Contract Documents;
(b) that the Contract has been fully performed;
(c) that to the best of their knowledge, information, and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with the terms and conditions of the

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Contract Documents;
(d) that all potential liens or Claims for Subcontractors' services and for labor, equipment, and materials on the Work have been satisfied or adequately secured;
(e) that the balance noted in the final certificate is due and payable; and
(f) that all necessary approvals of applicable federal, state, or local agencies and/or authorities have been issued.

23.05 Determination not to issue certificate for final payment. If the Architect and Construction Manager determine that the necessary findings cannot be made to issue a final certificate, the Construction Manager shall promptly notify Contractor, in writing, of the reasons for such determination. Contractor shall promptly thereafter take appropriate steps to remove the grounds for denial of the final certificate.

23.06 Acceptance by Board of Supervisors. Promptly after the Architect and Construction Manager issue the certificate for final payment, the matter will be submitted to the County Board of Supervisors for final acceptance of the Work. Work on the Contract shall be deemed complete when the Board of Supervisors accepts the Work. Not later than fifteen (15) days after such acceptance, County shall record its notice of completion.

23.07 Effect of final payment as to County. The making of the final payment by County to Contractor hereunder shall not constitute a waiver of any Claims which County may now or thereafter have against Contractor by reason of this Agreement or any other matter related to the Work.

23.08 Effect of final payment as to Contractor. Acceptance of final payment shall constitute a waiver of all Claims by Contractor except those previously made, in writing, and remaining still unsettled.

23.09 Final Payment. The final payment, if unencumbered, or any part thereof unencumbered, shall be made not later than 60 days after completion of the Work and submission of all completion documents.

ARTICLE 24 ALTERNATIVE PAYMENT OF WITHHELD FUNDS

24.01 Alternatives to withholding. This Contract requires a five percent (5%) withholding from progress payments. Progress payments shall not be made in excess of 95 percent (95%) of the actual Work completed plus a like percentage of the value of material delivered on the ground or stored subject to, or under the control of, County, and unused. County shall withhold five percent (5%) from the progress payments until final completion and acceptance of the Project by the Board of Supervisors. At Contractor's request, County shall make payment of these funds withheld from progress payments through the use of the escrow procedures provided in this Section and either Section 24.02 or Section 24.03. As a prerequisite to compliance with Section 24.02 or Section 24.03, Contractor shall select an escrow agent, who shall be County Auditor-Controller or any state or federally chartered bank in California; the parties shall enter into an escrow Agreement meeting the requirements of Public Contract Code Section 22300; and the parties shall deposit with the escrow agent the escrow Agreement, the withheld portions of the progress payments that have accrued before opening of the escrow, all future withheld portions as they accrue, and all other deposits required below. Contractor shall pay all expenses incurred in implementing the procedures set forth herein.

24.02 Alternative one: substitution of securities for withheld funds. At Contractor's request, eligible securities provided by Contractor, equivalent to the amount withheld, shall be deposited with the escrow agent, who shall then pay the withheld monies to Contractor. After the initial deposits and

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disbursements, County shall deposit all additional amounts to be withheld with the escrow agent as they accrue, and if Contractor desires their release, Contractor shall increase the amount of the securities on deposit, if necessary, in order that the value of the securities on deposit shall equal or exceed the total of all amounts currently and previously authorized to be withheld under the Contract without the substitution of securities. Upon satisfaction of that condition, the escrow agent shall immediately pay the additional withheld amounts to Contractor. Upon satisfactory completion of the Contract, the securities shall be returned to Contractor.

24.03 Alternative two: investment of withheld funds. Alternatively, Contractor may direct that the withheld funds deposited in the escrow be invested in eligible securities. Upon satisfactory completion of the Contract, Contractor shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from County. Contractor shall pay to each Subcontractor, not later than twenty (20) days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to ensure the performance of Contractor.

24.04 Eligible securities: interest. Securities eligible to be used under the above Sections shall include those listed in Government Code Section 16430, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and County. The parties must agree upon the value of the securities, as a condition of their deposit in the escrow. Contractor shall be the beneficial owner of any securities deposited pursuant to this Article 24 and shall receive any interest thereon. Contractor may withdraw interest earned on securities held in escrow at any time without notice to County.

24.05 Inapplicability of Article 24 to certain Contracts. The provisions of this Article 24 shall not apply to Contracts in which there will be financing provided by the Farmers Home Administration of the United States Department of Agriculture pursuant to the Consolidated Farm and Rural Development Act (7 U.S.C. Sec. 1921 et seq.) and where federal regulations or policies, or both, do not allow the substitution of securities.

PART V EMPLOYMENT PRACTICES

ARTICLE 25 APPRENTICES

25.01 Compliance with Labor Code apprenticeship requirements. Contractor and all Subcontractors shall comply with the provisions of Labor Code Sections 1777.5, 1777.6, and 1777.7, when applicable, pertaining to apprentices, and with all applicable regulations pursuant thereto (Title 8, California Code of Regulations, Sections 200 et seq., especially Sections 227 et seq.), including, but not limited to, provisions relating to required or permitted ratios of apprentices to experienced workers. When any question exists concerning these requirements, Contractor and/or any Subcontractor concerned should contact the Division of Apprenticeship Standards, 525 Golden Gate Avenue, San Francisco, California, or one (1) of its branch offices, prior to commencement of Work. The prime Contractor is responsible for ensuring compliance with this Section.

25.02 State policy. It is State policy to encourage the employment and training of apprentices on Public Works Contracts in conformity with standards set by law.

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ARTICLE 26 NON-DISCRIMINATION PROVISIONS

26.01 Non-discrimination in employment practices. Contractor shall ensure that the evaluation and treatment of its employees and applicants for employment and all persons receiving and requesting services are free of such discrimination. Contractor and any Subcontractor shall, in the performance of this Agreement, fully comply with all federal, state, and local laws and regulations which prohibit discrimination. The provision of services primarily or exclusively to such target population as may be designated in this Agreement shall not be deemed to be prohibited discrimination.

26.02 "Discrimination" defined. As used in this Contract, the term "discrimination" includes, but is not limited to, the illegal denial of equal employment opportunity, harassment (including sexual harassment and violent harassment), disparate treatment, favoritism, subjection to unfair or unequal working conditions, and/or any other prohibited discriminatory practice. The term also includes any act of retaliation.

26.03 Application of Monterey County Code, Chapter 2.80. The provisions of Monterey County Code (MCC), Title 2, Chapter 2.80, apply to activities conducted pursuant to this Contract. Contractor and its officers and employees, in their actions under this Contract, are agents of the Owner within the meaning of MCC Chapter 2.80 and are responsible for ensuring that their workplace and the services that they provide are free from discrimination, as required by MCC Chapter 2.80. Complaints of discrimination made by Contractor, Subcontractor(s), or any of their employees or agents against the Owner may be investigated and resolved using the procedures established by MCC Chapter 2.80. Contractor shall establish and follow its own written procedures for the prompt and fair resolution of discrimination complaints made against Contractor by its own employees, agents and third parties, and shall provide a copy of such procedures to County upon demand by County.

26.04 Compliance with laws. During the performance of this Agreement, Contractor shall comply with all applicable federal, state, and local laws and regulations, which prohibit discrimination, including, but not limited to, the following:
(a) California Labor Code Section 1735;
(b) California Fair Employment and Housing Act, Government Code Sections 12900 et seq., and the administrative regulations issued thereunder, Title 2 California Code of Regulations, Sections 7285.0 et seq. (Division 4 – Fair Employment and Housing Commission);
(c) California Government Code Sections 111–5 - 11139.5 (Title 2, Div. 3, Part 1, Chap.1, Art. 9.5) and any applicable administrative regulations issued thereunder;
(d) Federal Civil Rights Acts of 1964 and 1991 (see especially Title VII, 42 USC Sections 2000d et seq.), as amended, and all administrative rules and regulations issued thereunder (see especially 45 CFR Part 84); and all guidelines and interpretations issued pursuant thereto;
(e) The Rehabilitation Act of 1973, Sections 503 and 504 (29 USC Sections 793 and 794), as amended; all requirements imposed by the applicable HHS regulations (45 CFR Part 84); and all guidelines and interpretations issued pursuant thereto;
(f) Americans With Disabilities Act of 1990 (P.L. 101- 336), as amended, 42 USC Sections 12101 et seq., and 47 USC Sections 225 and 611, and any federal regulations issued pursuant thereto (see 24 CFR Chapter 1; 28 CFR Parts 35 and 36; 29 CFR Parts 1602, 1627 and 1630; and 36 CFR Part 1191;
(g) Unruh Civil Rights Act, California Civil Code Sections 51 et seq.; and
(h) Monterey County Code, Title 2, Chapter 2.80, as amended and procedures issued pursuant thereto.

26.05 Written assurances. Upon request by County, Contractor will give any written assurances of compliance with the Civil Rights Acts of 1964 and 1991, as amended, the Rehabilitation Act of 1973, as

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amended, the Americans With Disabilities Act of 1990, as amended, and/or Executive Order 11246, as may be required by the federal government in connection with this Contract, pursuant to 45 CFR Section 80.4 or 45 CFR Section 84.5 or other applicable state or federal regulations.

26.06 Written nondiscrimination policy. Contractor shall maintain a written statement of its nondiscrimination policies, which shall be consistent with the terms of this Agreement. Such statement shall be available to Contactor's employees, the Owner, Owner's officers and employees, and members of the public, upon request.

26.07 Notice to labor unions. Contractor shall give written notice of its obligations under Sections 26.01 through 26.09 to labor organizations with which it has a collective bargaining or other Agreement.

26.08 Access to records by government agencies. Contractor shall permit access by Owner and by representatives of the California Department of Fair Employment and Housing and the U.S. Equal Employment Opportunity Commission, and any federal and/or state agency providing funds for this Contract upon reasonable notice at any time during normal business hours, but in no case on less than twenty-four (24) hours notice, to such of its books, records, accounts, facilities, and other sources of information as the inspecting party may deem appropriate to ascertain compliance with these nondiscrimination provisions.

26.09 Binding on Subcontractors. The provisions of Sections 26.01 through 26.09 shall also apply to all of Contractor's Subcontractors. Contractor shall include the nondiscrimination and compliance provisions of these Sections in all Subcontracts to perform Work or provide services under this Contract.

ARTICLE 27 HOURS OF WORK

27.01 Eight (8) hour day; forty (40) hour week. No Work shall be performed by employees of Contractors in excess of eight (8) hours per day or forty (40) hours during any one (1) week, unless such employees are compensated for all such excess hours at not less than one-and-one half times the basic rate of pay, as provided in Labor Code Section 1815. Holiday Work when permitted by law shall also be compensated at not less than one-and-one half times the basic rate of pay.

27.02 Penalties. Pursuant to Labor Code Section 1813, Contractor shall forfeit, as a penalty to County, $25 for each worker employed in the execution of the Contract by Contractor or any Subcontractor under Contractor for each calendar day during which such worker is required or permitted to work 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 the Labor Code Sections 1810 through 1815.

27.03 Approvals. Contractor will not be entitled to additional compensation for Work performed outside of regular working hours, except to the extent such compensation is approved in advance, in writing, by Construction Manager. If so approved, such compensation shall in such event cover only the direct cost of the premium portion of the time involved, when permitted, and be without any overhead or profit.

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ARTICLE 28 PREVAILING WAGES

28.01 Prevailing wage rates determined. The Director of the California Department of Industrial Relations has determined the general prevailing rate of per diem wages in the locality in which said public Work is to be performed for each craft, classification, or type of worker needed to execute the Contract in accordance with Labor Code Sections 1770 through 1775. Copies of the prevailing rate of per diem wages are on file and shall be made available to any interested party on request in the PWFP – Public Works, Parks and Facilities office located at 1441 Schilling Place, Second Floor, Salinas California 93901. Current prevailing wage rate schedules can also be found at the California Department of Industrial Relations website located at http://www.dir.ca.gov/DLSR/PWD/.

28.02 Payment of prevailing wage rates required. Contractor and all Subcontractors performing Work under this Contract shall pay wages to their workers employed on such Work at not less than the general prevailing rate of per diem wages for such Work, as required by Labor Code Section 1771.

28.03 Penalties. Failure to pay such prevailing wages shall subject the employer to the penalties set forth in Labor Code Section 1775.

28.04 Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation, California Labor Code Section 1776 and Sections 1810 through 1815. Failure to so comply shall constitute a default under this Contract.

ARTICLE 29 PAYROLL RECORDS

29.01 Compliance with Labor Code Section 1776. Contractor and all Subcontractors shall comply with Labor Code Section 1776 as may be amended from time to time. Contractor shall be responsible for compliance with these provisions by his /her/its Subcontractors.

29.02 Accurate payroll records required. Contractor and each Subcontractor shall keep accurate payroll records, 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/her/it in connection with the public Work.

29.03 Certification and inspection of payroll records. The payroll records enumerated under Section 29.02 shall be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor or Subcontractor on the following basis:
(a) A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or his or her authorized representative on request.
(b) A certified copy of all payroll records enumerated in Section 29.02 shall be made available for inspection, or furnished upon request, to a representative of County, and/or the Division of Labor Standards Enforcement of the Department of Industrial Relations (DIR).
(c) A certified copy of all payroll records enumerated in Section 29.02 shall be made available upon request to the public for inspection or copies thereof made; provided however, that a request by the public shall be made through County, or the Division of Labor Standards Enforcement of the DIR. The public shall not be given access to such records at the principal offices of Contractor.

29.04 Filing of records. Contractor and each Subcontractor shall file a certified copy of the records enumerated in Section 29.02 with the entity that requested such records within ten (10) days after

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receipt of a written request.

29.05 Elimination of personal identification. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by County, or the Division of Labor Standards Enforcement of the DIR shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor or Subcontractor awarded the Contract or performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a joint labor management committee established pursuant to the Federal Labor Management Cooperation Act of 1978 (29USC 175a) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

29.06 Notice to County concerning location of records. Contractor and each Subcontractor shall inform County as to the location of the records enumerated under Section 29.02, including the street address, city, and county, and shall within five (5) Work days, provide a notice of any change of location and address.

29.07 Notice of noncompliance; penalties. The Contractor or Subcontractor has ten (10) days in which to comply subsequent to receipt of a written notice requesting the records enumerated in Section 29.02. In the event that the Contractor or Subcontractor fails to comply with the ten (10) day period, he/she/it shall, as a penalty to the County, forfeit one hundred dollars ($100) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement of the DIR, these penalties shall be withheld from progress payments then due. The Contractor is not subject to a penalty assessment pursuant to this Section due to the failure of a Subcontractor to comply with this Section.

29.08 DIR Requirements. All Contractors and Subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (Division of Labor Standards Enforcement of the DIR). Additionally, the awarded Contractor shall submit electronic certified payroll records to Construction Manager with each application for payment and/or concurrent with the required monthly submittal to the DIR.

PART VI LEGAL RELATIONS

ARTICLE 30 COMPLIANCE WITH LAWS

30.01 Compliance with laws. Contractor shall keep fully informed of and shall comply with all laws, ordinances, regulations and orders of any properly constituted authority affecting the Contract Documents, Work and persons connected with Work, and shall protect and indemnify Owner and its officers, employees, consultants and agents against any Claim or liability, including attorney's fees, arising from or based on violation of law, ordinance, regulation or order, whether by Contractor or by Subcontractors, employees or agents. Authorized persons may at any time enter upon any part of Work to ascertain compliance of all applicable laws, ordinances, regulations and orders. Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and orders of any public authority bearing on the performance of the Work. If Contractor observes that any of the Contract Documents are at variance therewith in any respect, he/she/it shall promptly notify Construction Manager in writing, and any necessary changes shall be adjusted by appropriate modification. If Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to Construction Manager, Contractor shall assume full responsibility therefore, and shall bear all costs

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attributable thereto. Without limitation of any other provision hereof, if Contractor performs any Work which is contrary to such laws, ordinances, codes, rules and regulations, Contractor shall without additional reimbursement or extension of time make all changes and bear all costs as required to comply.

30.02 Rules of governing agencies. All Work and materials shall be in full accordance with the Rules and Regulations of the State Fire Marshall, the Construction Safety Orders of the Division of Industrial Safety of the DIR, and all other applicable codes and regulations.

30.03 Compliance with uniform codes. All Work and materials shall comply with the current editions of the California Building Code, the California Electric Code, the California Plumbing Code, the California Mechanical Code, and the California Administrative Code, and Title 18 of the Monterey County Code.

30.04 Statutory regulation of Public Works. This Contract is subject to all statutes of the State of California regulating the performance of Work by a public agency or political subdivision of such state, and particularly the following:

- Public Contract Code Sections 4100-4114 (Subletting and Subcontracting Fair Practices Act).
- Labor Code Sections 1720-1743 (Public Works, Scope, and Operation).
- Labor Code Sections 1770-1781 (Public Works, Wages).
- Labor Code Sections 1810-1815 (Public Works, Working Hours).

All Work performed under this Contract, whether by Contractor or by any Subcontractor, shall comply with all such statutes.

30.05 Compliance with Clean Air and Clean Water Acts. Contractor and all Subcontractors shall comply with the Federal Clean Air Act (42 USC Sections 1857 et seq. and 42 USC Sections 7401 et seq.) and with the Federal Clean Water Act (33 USC Sections 1251 et seq.) and all other applicable federal air and water pollution control rules and regulations.

30.06 Federally funded Contracts. If the Project for which the Work under this Contract is to be performed is funded in whole or in part by grants or loans from the federal government, Contractor and all Subcontractors shall comply with regulations adopted by the U.S. Secretary of Labor pursuant to 40 USC Section 276c and with all other statutes, rules, and regulations that are applicable because of such federal funding.

30.07 Kickbacks and illegal withholdings of pay. Contractor and all Subcontractors shall comply with the provisions of Labor Code Sections 221 and 222, which prohibit kickbacks and withholdings from employee wages.

30.08 Illegal fees. Contractor and all Subcontractors shall comply with the provisions of Labor Code Sections 1778, 1779, and 1780, which prohibit the taking of any portion of the wages of workers employed on Public Works Projects and the collection of certain fees from workers employed on Public Works Projects and from applicants for such employment.

30.09 Provisions required by law deemed inserted. Each and every provision required by law to be inserted in this Contract shall be deemed to be inserted herein as may be amended from time to time, and this Contract shall be read and enforced as though it were included herein. If through mistake or otherwise any such provision is not accurately set forth in the Contract Documents, or is not correctly

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set forth, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion or correction through a written amendment signed by the Contractor and Owner.

30.10 Good faith effort to employ Monterey Bay Area residents. For all provisions of the Good faith effort to employ Monterey Bay area residents, see Instructions to Bidders, Division 002000, number 16, and Contractor's Certification of Good Faith Effort to Employ Monterey Bay Area Residents.

30.11 Employment of undocumented aliens. Comply with California Public Contract Code Section 6101 which provides that no state agency or department, as defined in Public Contract Code Section 10335.7, that is subject to the Public Contract Code, shall award a public works or purchase contract to a bidder or contractor, nor shall a bidder or contractor be eligible to bid for or receive a public works or purchase contract, who has, in the preceding five (5) years, been convicted of violation of a state or federal law respecting the employment of undocumented aliens.

30.12 Nondiscrimination. No person or entity shall discriminate in the employment of persons upon Public Works because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sexual preference, or gender of such persons, except as provided in Section 12940 of the California Government Code. Every Contractor for Public Works violating the provisions of Section 1735 of the California Labor Code is subject to all the penalties imposed for a violation of Chapter 1, Part 7, Division 2 of the California Labor Code.

30.13 Child Support Compliance. In accordance with California Public Contract Code Section 7110, CONTRACTOR and any and all SUBCONTRACTORS recognize the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the California Family Code; and, CONTRACTOR and SUBCONTRACTORS, to the best of their knowledge, are fully complying with the earnings assignment orders of all employees and is/are providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

ARTICLE 31 PERFORMANCE AND PAYMENT BONDS

31.01 Required bonds and amounts. Contractor shall furnish a Surety Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for faithful performance of this Contract ("Performance Bond") and shall furnish a separate Surety Bond in an amount at least equal to one hundred percent (100%) of the Contract Sum as security for the payment of all persons performing labor and furnishing materials in connection with the Contract ("Payment Bond"). Both the Performance Bond and the Payment Bond must be executed by an admitted surety insurer. The form of these bonds shall be as set forth in these Contract Documents.

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ARTICLE 32 INDEMNIFICATION AND INSURANCE

32.01 Indemnification.

A. Contractor shall indemnify, defend, and hold harmless County, and its officers, employees and agents from and against any and all Claims, liabilities, and losses whatsoever (including damages to property and injuries to or death of persons, court costs, and reasonable attorneys' fees) occurring or resulting to any and all persons, firms, or corporations furnishing or supplying Work, services, materials, or supplies in connection with the performance of this Contract, and from any and all Claims, liabilities, and losses occurring or resulting to any person, firm, or corporation for damage, injury, or death due to, arising out of, or connected with Contractor's performance of this Contract, unless such Claims, liabilities, or losses arise out of the sole negligence or willful misconduct of County. "Contractor's performance" includes Contractor's action or inaction and the action or inaction of Contractor's officers, employees, agents, and Subcontractors.

B. For purposes of the following indemnification provisions ("Indemnification Agreement"), "design professional" has the same meaning as set forth in California Civil Code section 2782.8. If any term, provision or application of this Indemnification Agreement is found to be invalid, in violation of public policy or unenforceable to any extent, such finding shall not invalidate any other term or provision of this Indemnification Agreement and such other terms and provisions shall continue in full force and effect. If there is any conflict between the terms, provisions or application of this Indemnification Agreement and the provisions of California Civil Code Sections 2782 or 2782.8, the broadest indemnity protection for COUNTY under this Indemnity Agreement that is permitted by law shall be provided by CONTRACTOR.

C. Indemnification for Design Professional Services Claims. CONTRACTOR shall indemnify, defend and hold harmless COUNTY, its governing board, directors, officers, employees, and agents against any claims that arise out of, or pertain to, or relate to the negligence, recklessness, or willful misconduct of CONTRACTOR, its employees, subcontractors, and agents in the performance of design professional services under this Agreement, excepting only liability arising from the sole negligence, active negligence or willful misconduct of COUNTY, or defect in a design furnished by COUNTY, but in no event shall the amount of such CONTRACTOR's liability exceed such CONTRACTOR's proportionate percentage of fault as determined by a court, arbitrator or mediator, or as set out in a settlement agreement. In the event one (1) or more defendants to any action involving such claim or claims against COUNTY is unable to pay its share of defense costs due to bankruptcy or dissolution of the business, such CONTRACTOR shall meet and confer with the other parties to such action regarding unpaid defense costs.

D. Indemnification for All Other Claims or Loss. For any claim, loss, injury, damage, expense or liability other than claims arising out of CONTRACTOR's performance of design professional services under this Agreement, CONTRACTOR shall indemnify, defend and hold harmless COUNTY, its governing board, directors, officers, employees, and agents against any claim for loss, injury, damage, expense or liability resulting from or alleging injury to or death of any person or loss of use of or damage to property, arising from or related to the performance of services under this Agreement by CONTRACTOR, its employees, subcontractors or agents, excepting only liability arising from the sole negligence, active negligence or willful misconduct of COUNTY, or defect in a design furnished by COUNTY.

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32.02 Evidence of Coverage.
A. Prior to commencement of this Contract, Contractor shall provide a "Certificate of Insurance" to the Construction Manager for transmittal to County with a copy to the Architect prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance certifying that coverage as required herein has been obtained. Individual endorsements executed by the insurance carrier shall accompany the certificate. In addition, a certified copy of the policy or policies shall be provided by Contractor upon request.

B. Contractor shall not receive a "Notice to Proceed" with the Work under this Contract until it has obtained all insurance required and such insurance has been approved by County. This approval of insurance shall neither relieve nor decrease the liability of Contractor.

32.03 Qualifying Insurers. All Coverages, except Surety, shall be issued by companies which hold a current policyholder's alphabetic and financial size category rating of not less than A-VII, according to the current Best Key Rating Guide or a company of equal financial stability that is approved by County Contracts/Purchasing Manager.

32.04 General insurance requirements. Without limiting Contractor's duty to indemnify, Contractor shall maintain in effect throughout the term of this Contract a policy or policies of insurance with the following minimum limits of liability:

32.04.1. Commercial General Liability Insurance, including, but not limited to, premises and operations, including coverage for Bodily Injury and Property Damage, Personal/Advertising Injury, Contractual Liability, Broadform Property Damage, Independent Contractors, Products and Completed Operations, and with a ten (10) year Products and Completed Operations extension, with limits as follows:

General Aggregate (Reinstates Annually)	$ 4,000,000
Products/ Completed Operations Aggregate	$ 4,000,000
Personal/ Advertising Injury	$ 2,000,000
Each Occurrence Limit	$ 2,000,000

32.04.2. Builders Risk/Course of Construction Insurance, covering the entire Work at the Site to the full insurable value thereof. This insurance shall include the interests of the County, Contractor, and all Subcontractors in the Work and shall insure against the perils of fire, extended coverage, builder's risk, vandalism, and malicious mischief.

32.04.3. Business Automobile Liability Insurance, covering all motor vehicles, including owned, leased, non-owned, and hired vehicles, used in providing services under this Agreement, with a combined single limit for Bodily Injury and Property Damage of not less than $1 Million ($1,000,000) per occurrence.

32.04.4. Workers' Compensation Insurance, if Contractor employs others in the performance of this Contract, in accordance with California Labor Code Section 3700 and with Employer's Liability limits not less than $1 Million ($1,000,000) each person, $1 Million ($1,000,000) each accident, and $1 Million ($1,000,000) each disease.

32.04.5. Professional Liability Insurance, if required for the professional services being provided, (e.g., those persons authorized by a license to engage in a business or profession regulated by the

California Business and Professions Code), in the amount of not less than $1 Million ($1,000,000) per Claim and $2 Million ($2,000,000) in the aggregate, to cover liability for malpractice or errors or omissions made in the course of rendering professional services. If professional liability insurance is written on a "Claims-made" basis rather than an occurrence basis, Contractor shall, upon the expiration or earlier termination of this Contract, obtain extended reporting coverage ("tail coverage") with the same liability limits. Any such tail coverage shall continue for at least three (3) years following the expiration or earlier termination of this Contract.

32.04.6. Excess Liability Insurance (over commercial general liability) of not less than combined single limit $10 Million ($10,000,000), General Aggregate $10 Million ($10,000,000) and Products and Completed Operations Aggregate $10 Million ($10,000,000), and with a ten (10) year Products and Completed Operations extension.

32.05 Subcontractor Insurance Requirements. Without limiting Contractor's duty to indemnify, Contractor shall also require all Subcontractors to maintain in effect throughout the term of this Contract all Commercial General Liability Insurance, Builders Risk/Course of Construction Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Professional Liability Insurance, and Excess Liability Insurance described in Section 32.04 General insurance requirements. above, except that the minimum limits of General Liability Insurance shall be at least a combined single limit for Bodily Injury and Property Damage of not less than $1 Million ($1,000,000) per occurrence, general aggregate limits of not less than $2 Million ($2,000,000), limits for Products and Completed Operations of not less than $2 Million ($2,000,000) aggregate and $1 Million ($1,000,000) per occurrence, and limits for Personal/Advertising Injury of not less than $1 Million ($1,000,000) per occurrence and aggregate.

32.06 Other insurance requirements.
A. All insurance required by this Contract shall be with a company acceptable to the County and issued and executed by an admitted insurer authorized to transact Insurance business in the State of California. Unless otherwise specified by this Contract, all such insurance shall be written on an occurrence basis, or, if the policy is not written on an occurrence basis, such policy with the coverage required herein shall continue in effect for a period of three (3) years following the date Contractor completes its performance of services under this Contract.

B. Each liability policy shall provide that the County shall be given notice, in writing, at least thirty (30) days in advance of any endorsed reduction in coverage or limit, cancellation, or intended non-renewal thereof. Each policy shall provide coverage for Contractor and additional insureds with respect to Claims arising from each Subcontractor, if any, performing Work under this Contract, or be accompanied by a certificate of insurance from each Subcontractor showing each Subcontractor has identical insurance coverage to the above requirements.

C. *Commercial General Liability Insurance and Business Automobile Liability Insurance policies shall provide an endorsement naming the County of Monterey, its officers, agents, and employees as Additional Insureds with respect to liability arising out of Contractor's Work, including ongoing and completed operations, and shall further provide that such insurance is primary insurance to any insurance or self-insurance maintained by the County and that the insurance of the Additional Insureds shall not be called upon to contribute to a loss covered by the Contractor's insurance. The required endorsement form for Commercial General Liability Additional Insured* ***is ISO Form CG 20 10 11-85 or CG 20 10 10 01 in tandem with CG 20 37 10 01 (2000)****. The required endorsement form for Business Automobile Liability Additional Insured endorsement is* ***ISO Form CA 20 48 02 99.***

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D. Prior to the execution of this Contract by the County, Contractor shall file certificates of insurance with County's Contract administrator and County Contracts/Purchasing Division, showing that Contractor has in effect the insurance required by this Contract. The Contractor shall file a new or amended certificate of insurance within five (5) calendar days after any change is made in any insurance policy which would alter the information on the certificate then on file. Additionally, Contractor shall provide certificates for Subcontractors of any tier in compliance with these provisions. Acceptance or approval of insurance shall in no way modify or change the indemnification clause in this Contract, which shall continue in full force and effect.

E. Contractor shall at all times during the term of this Contract maintain in force the insurance coverage required under this Contract and shall send, without demand by County, annual certificates to County's Contract Administrator and County Contracts/Purchasing Division. If the certificate is not received by the expiration date, County shall notify Contractor and Contractor shall have five (5) calendar days to send in the certificate, evidencing no lapse in coverage during the interim. Failure by Contractor to maintain such insurance is a default of this Contract which entitles County, at its sole discretion, to terminate this Contract immediately.

32.07 Acknowledgment of Workers' Compensation Requirements. As required by Labor Code Section 1861, Contractor and each Subcontractor shall, before commencing Work on the Project, sign and file with the County, the following certificate:

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

32.08 Compliance. In the event of the failure of Contractor to furnish and maintain any insurance required by this Section, County, Construction Manager, or Architect shall have the right to take out and maintain such insurance for and in the name of Contractor. Contractor shall pay the cost thereof and shall furnish all information necessary to obtain and maintain such insurance for the account of Contractor. County, Construction Manager, and Architect shall each have the right to offset the costs of obtaining and maintaining such insurance against any amounts due Contractor under the Contract Documents. Compliance by Contractor with the requirement to carry insurance and furnish certificates or policies evidencing the same contained in this Article 32 shall not relieve Contractor from liability assumed under any provision of the Contract Documents, including, without limitation, the obligation to defend and indemnify each of the Indemnities.

32.09 Application of Insurance Proceeds.
(a) In the event of any damage to or destruction of the Work from any cause insured against by the insurance required under this Article 32, or any other insurance obtained by Contractor or any other source, County may, in its sole discretion, either (i) require Contractor to repair any such damage or destruction and reconstruct the Work in accordance with the Contract Documents, and Contractor agrees to perform any such requirement of Architect, or (ii) terminate the Contract and Contractor shall have no Claim arising out of such termination. In the event the Work is repaired or reconstructed, appropriate adjustments, if any, in the amount of the Contract Sum or for the time of completion of the Work shall be made by Change Order. County shall be given credit against any amount due Contractor under the Contract Documents for the amount of any insurance proceeds collected by Contractor to the extent such proceeds cover costs otherwise payable by County under the Contract

Documents. In the event that County decides not to restore or reconstruct the Work and terminates the Contract, Contractor shall receive from the insurance proceeds all amounts due Contractor under the Contract for that portion of the Work completed as of the date of the event of damage or destruction.
(b) In the event of any damage to or destruction of the Work (i) not due to or arising out of the fault or neglect of Contractor or any Subcontractor and (ii) from a cause not insured against by the insurance required under this Article 32, County may, in its sole discretion, either (i) require Contractor to repair any such damage or destruction and reconstruct the Work in accordance with the Contract Documents, and Contractor agrees to perform any such requirements of Architect, or (ii) terminate the Contract. In the event County decides not to restore or reconstruct the Work in accordance with the Contract Documents and causes termination of the Contract, Contractor shall have no Claim arising out of such termination. In the event that Work is repaired or reconstructed, appropriate adjustments, if any, in the amount of the Contract Sum and for the Time of completion of the Work shall be made by Change Order. County shall be given credit against any amount due Contractor under the Contract Documents to the extent insurance proceeds payable to Contractor cover costs otherwise payable by County under the Contract Documents. In the event that County decides not to restore or reconstruct the Work and causes termination of this Contract, County shall pay Contractor, as its sole compensation, all amounts due under the Contract Documents for the portion of the Work completed as of the date of the event of damage or destruction. Contractor shall be solely responsible for and shall, without cost or expense to County, promptly and with all due diligence, restore and reconstruct any uninsured loss or damage to the Work which occurs as a result of any fault or neglect of Contractor or any Subcontractor. This obligation is in addition to County's remedies under the Contract Documents or by law.

ARTICLE 33 CLAIMS AND DISPUTE RESOLUTION

33.01 Prompt resolution of differences required. It is the intention of this Article that differences between the parties arising under and by virtue of this Contract be brought to the attention of Construction Manager and Architect at the earliest possible time in order that such matters may be promptly settled, if possible, or other appropriate action may be taken promptly. To that end, County and Contractor agree to attempt informal resolution of disputes prior to initiating the Claim process.

33.02 Contract interpretations/performance judging/decisions by Architect and Construction Manager.
(a) All Claims may be presented informally first to Architect. To the extent that resolution of the Claim does not involve an extension of time or additional payments, Architect may resolve, in writing, or otherwise, Claims that have been presented informally.

(b) The Architect will be, in the first instance, the interpreter of the requirements of the Contract Documents and the judge of performance thereunder by both County and Contractor. The Architect will, within a reasonable time, render such interpretations, as Construction Manager may deem necessary for the proper execution or progress of the Work. Claims, disputes, and other matters in question between Contractor and County relating to the execution or progress of the Work or interpretation of the Contract Documents shall be referred initially to the Architect for decision which Architect will render, in writing, within a reasonable time. In Architect’s capacity as interpreter and judge, Architect will exercise his or her best efforts to ensure faithful performance by both County and Contractor and will not show partiality to either. All interpretations and decisions of the Architect shall be consistent with the intent of the Contract Documents.

33.03 Obligation to Seek Informal Resolution Prior to Filing Claim for Disputed Work. Should it appear to Contractor that the Work to be performed or any of the matters relative to the Contract Documents are not satisfactorily detailed or explained therein, or should any questions arise as to the meaning or intent of the Contract Documents, or should any dispute arise regarding the true value of

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any Work performed, Work omitted, extra Work that the Contractor may be required to perform, time extensions, payment to the Contractor during performance of this Contract, performance of the Contract, and/or compliance with Contract procedures, or should Contractor otherwise seek extra time, compensation or payment FOR ANY REASON WHATSOEVER, then Contractor shall first follow procedures set forth in the Contract (including but not limited to other Articles of this Division 007100 and Section 01 2600.). If a dispute remains, then Contractor shall give written notice to County that expressly invokes this Article 33. County shall decide the issue in writing within fifteen (15) days; and County's written decision shall be final and conclusive.

33.04 Time for giving notice. Notice of dispute or potential Claim must be given in writing by the Contractor as follows:

(a) For a potential Claim of an increase in the Contract Sum, Contractor shall give the Architect written notice thereof within ten (10) days after the occurrence of the event giving rise to such Claim; in addition, this notice shall be given by Contractor before proceeding to execute the portion of the Work to which the Claim relates, except in an emergency endangering life or property, and except where Contractor could not reasonably have discovered the facts giving rise to the Claim prior to commencement of that portion of the Work.

(b) For a potential Claim for an extension of time, Contractor shall give written notice to the Construction Manager no more than ten (10) days after the occurrence of the delay; otherwise, the potential Claim for the extension of time shall be waived. In the case of a continuing cause of delay, only one (1) Claim is necessary.

(c) In all other cases, notice shall be given within ten (10) days after the happening of the event, thing, or occurrence giving rise to the potential Claim.

33.05 Form and Contents of Claim. If Contractor disagrees with County's decision, or if Contractor contends that County failed to provide a timely decision, then Contractor's SOLE AND EXCLUSIVE REMEDY is to promptly file a written Claim setting forth Contractor's position as required herein. The Claim shall be submitted to County within thirty (30) calendar days of receiving County's written decision, or the date Contractor contends such decision was due. The Contractor shall furnish reasonable documentation to support the Claim. Contractor's written Claim must identify itself as a "Claim" under this Article 33 and must include the following: (1) a narrative of pertinent events; (2) citation to contract provisions; (3) theory of entitlement; (4) complete pricing of all cost impacts; (5) a time impact analysis of all time delays that shows actual time impact on the critical path; and (6) documentation supporting items (1) through (5). The Claim must be verified under penalty of perjury by Contractor's Project Superintendent as to the Claim's accuracy, and shall be priced like a Change Order, and must be updated monthly as to cost and entitlement if a continuing Claim. The Claim must be sent by registered mail or certified mail with return receipt requested to the County per Article 7, Notices, of the Agreement. Routine contract materials, for example, correspondence, RFI, Change Order requests, or payment requests shall not constitute a Claim. Contractor shall bear all costs incurred in the preparation and submission of a Claim.

33.06 Actions by County Upon Receipt of Claim.

(a) Upon receipt of a Claim, the County shall conduct a reasonable review of the Claim and, within a period not to exceed forty-five (45) days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed.

(b) The County and the Contractor may, by mutual agreement, extend the time period provided in this Article.

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(c) If the County needs approval from the Board of Supervisors to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the Board does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the County shall have up to three (3) days following the next duly publicly noticed meeting of the governing body after the forty-five (45) day period or the mutually agreed to extension expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

33.07 Written Statement by County. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the County issues its written statement. Failure by the County to issue a written statement shall result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the County's failure to have responded to a Claim, or its failure to otherwise meet the time requirements of this Article 33, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of the Contractor.

33.08. Contactor's Dispute of Written Response. If the Contractor disputes the County's written response, or if the County fails to respond to a Claim issued pursuant to this Article within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the County shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

33.09. Written Statement by County After Meet and Confer Conference. Within ten (10) business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the County shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the County issues its written statement.

33.10. Nonbinding Mediation.

(a) Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the County and the Contractor sharing the associated costs equally. The County and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

(b) Mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this Article.

(c) If mediation is unsuccessful, the parts of the Claim remaining in dispute shall be subject to applicable procedures outside this Article.

(d) Unless otherwise agreed to by the County and the Contractor in writing, the mediation conducted pursuant to this Article shall excuse any further obligation under Section 20104.4 of the Public Contract Code to mediate after litigation has been commenced.

(e) The Claim resolution procedures in this Article do not preclude the County from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this Article does not resolve the parties' dispute.

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33.11 Claims by Subcontractors. If a Subcontractor or a lower tier Subcontractor lacks legal standing to assert a Claim against the County because privity of contract does not exist, the Contractor may present to the County a Claim on behalf of a Subcontractor or lower tier Subcontractor. A Subcontractor may request in writing, either on his/her/its own behalf or on behalf of a lower tier Subcontractor, that the Contractor present a Claim for Work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the Claim be presented to the public entity shall furnish reasonable documentation to support the Claim. Within forty-five (45) days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the Claim to the County and, if the original Contractor did not present the Claim, provide the Subcontractor with a statement of the reasons for not having done so.

33.12 Prompt response when needed. Whenever it appears that a prompt response is essential, County will respond to Claims sooner than the limits prescribed above.

33.13 Compliance.

(a) The provisions of this Article constitute a non-judicial Claim settlement procedure that, pursuant to Section 930.2 of the California Government Code, shall constitute a condition precedent to submission of a valid Claim under the California Government Code. Contractor shall bear all costs incurred in the preparation, submission and administration of a Claim. Any Claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the Claims procedure herein and the previous dispositions of the Claims asserted. Pursuant to Government Code Section 930.2, the one (1) year period in Government Code Section 911.2 shall be reduced to one hundred and fifty (150) days from either accrual of the cause of action, substantial completion or termination of the contract, whichever occurs first; in all other respects, the Government Code shall apply unchanged.

(b) Failure to submit and administer Claims as required in Article 33 shall waive Contractor's right to Claim on any specific issues not included in a timely submitted Claim. Claim(s) or issue(s) not raised in a timely protest and timely Claim submitted under this Article 33 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.

(c) County shall not be deemed to waive any provision under this Article 33, if at County's sole discretion, a Claim is administered in a manner not in accord with this Article 33. Waivers or modifications of this Article 33 may only be made through a signed Change Order approved as to form by legal counsel for both County and Contractor; oral or implied modifications shall be ineffective.

33.14 Filing of Government Code claims. If the Contractor still remains unsatisfied and desires to preserve his/her/its right to pursue the matter further, Contractor must then file a claim with County, pursuant to Government Code Section 900 et seq. or Section 910 et seq.

33.15 Civil action. If the Government Code claim is denied, Contractor may file an action in court. Such action shall be subject to Public Contract Code Sections 9204 or 20104.4. This Section applies only to claims subject to Public Contract Code Sections 9204 or 20104. If a claim is not subject to Public Contract Code Sections 9204 or 20104, the Contractor's right to file a civil action shall be as otherwise provided by law.

33.16 Claims for damages. Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of his/her/its employees, agents, or others for whose acts he/she/it is legally liable, a Claim shall be made, in writing, to such other party within a reasonable time after the first observance of such injury or damage, provided that in no case may such a Claim be filed after expiration of any applicable statute of limitations for filing such a

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Claim. Claims against County that are subject to this Article shall comply with all procedures set forth in the California Government Code concerning claims against public entities.

33.17 Consistency with Public Contract Code Sections 9204 and 20104 et seq. If any Claim arising under this Contract is subject to the provisions of Public Contract Code Sections 9204 or 20104 et seq. (Division 2, Part 3, Chapter 1, Article 1.5), and if provisions of that Article require a procedure or procedural element different from that established in this Contract, then the provisions of that Article shall apply in place of the conflicting procedure or procedural element established herein.

ARTICLE 34 DEFAULT AND TERMINATION OF THE CONTRACT

34.01 Suspension Of Work. Owner may, without cause, order Contractor in writing to suspend, delay or interrupt Work in whole or in part for such period of time as Owner may determine. An adjustment shall be made for increases in cost of performance of Work of the Contract Documents caused by any such suspension, delay or interruption, calculated using the measures set forth in the Modification Procedures Section. No adjustment shall be made to the extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible.

34.02 County's right to stop Work. If Contractor fails to correct Defective Work or fails to supply materials or equipment in accordance with the Contract Documents, County may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

34.03 County's rights on Contractor's default. If Contractor fails to prosecute the Work diligently or fails to perform any provision of this Contract, County may, after seven (7) days written notice to Contractor and without prejudice to any other remedy, make good such deficiencies. In such case, any appropriate Change Order shall be issued deducting from the payments then or thereafter due Contractor, the cost of correcting such deficiencies, including the cost of Architect's, Construction Manager's, and other County Contractors' additional services made necessary by such default. Such Change Order shall not require the consent of Contractor to be effective. County, Construction Manager, and Architect must approve both such action and the amount charged to Contractor. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to County.

34.04 Termination by County.

A. County may terminate the performance of Contractor under this Contract, without prejudice to any other right or remedy County may have, in the manner hereinafter provided, upon certification by Construction Manager that the following circumstances have arisen:

1. Contractor is adjudged bankrupt, or makes a general assignment for the benefit of his/her/its creditors, or a receiver is appointed on account of his/her/its insolvency (except as provided in Subsection (E) below);
2. Contractor refuses or fails, except in cases for which an extension of time is provided, to supply enough properly skilled workers or proper materials;
3. Contractor fails to make prompt payment to Subcontractors, to suppliers of materials or equipment, or to employees;
4. Contractor disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction; or
5. Contractor otherwise is guilty of a substantial violation of the Contract.

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B. To terminate the performance of Contractor, County shall first give ten (10) days written notice to Contractor and Contractor's Surety, if any, stating County's intent to terminate the performance of Contractor unless within ten (10) days the grounds for such termination have been removed, and giving County's reasons therefore.
C. If within ten (10) days the grounds for termination are not removed, County may immediately terminate the performance of Contractor and shall promptly serve notice of termination on Contractor and the Surety. The Surety shall have the right to take over and perform the Contract, provided that, within fifteen (15) days after service upon it of said notice of termination, the Surety must first give written notice to County that it intends to take over and perform the Contract, and within thirty (30) days after service upon it of said notice of termination, the Surety must commence performance of the Contract. If Surety fails to take either of these steps in a timely manner, County may immediately take possession of the Site and all materials, equipment, tools, construction equipment, and machinery thereon owned by Contractor and may finish the Work by whatever method it may deem expedient.
D. If within ten (10) days of County's notice of intent to terminate, the grounds for termination are not removed, Contractor shall not be entitled to receive any further payment until the Work is finished. If, upon completion of the Work by County, the unpaid balance of the Contract Sum exceeds the costs of finishing the Work (including compensation for additional architectural, managerial, and administrative services), such excess shall be paid to Contractor. If such costs exceed such unpaid balance, Contractor or Contractor's Surety shall pay the difference to County. The costs incurred by County as herein provided shall be certified by Construction Manager.
E. Notwithstanding the foregoing, performance of Contractor under this Contract may not be terminated, and this Contract may not be modified, where a trustee in bankruptcy has assumed this Contract pursuant to 11 U.S.C. Section 365.
F. In the event a termination for cause is later determined to have been made wrongfully or without cause, then the termination shall be treated as a termination for convenience, and the Contractor shall have no greater rights than it would have had following a termination for convenience. Any Contractor Claim arising out of a termination for cause shall be made in accordance with Article 33 herein. No other loss, cost, damage, expense or liability may be claimed, requested or recovered by the Contractor.

34.05 Termination by Contractor.
(a) Contractor may, upon seven (7) days written notice to County, Architect, and Construction Manager, terminate the Contract if the Work is stopped for a period of forty-five (45) 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 their agents or employees or any other person performing any of the Work under a Contract with Contractor.
(b) To terminate the Contract, Contractor must give written notice to County, Construction Manager, and Architect of such termination, stating the reasons therefore.
(c) Contractor may then recover from County payment for all Work executed, for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, for lost profits, and for all other damages suffered by Contractor on account of such stoppage of Work.

34.06 Termination for Convenience of County.
(a) The performance of Work under this Contract may be terminated by County in whole, or in part, whenever County shall determine that termination is in the best interest of County. Any such termination shall be effected by delivery to Contractor of a Notice of Termination specifying the extent to which performance of Work under this Contract is terminated, and the date upon which such

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termination becomes effective.
(b) After receipt of a Notice of Termination, and except as otherwise directed by County, Contractor shall:
1. Stop Work under this Contract on the date and to the extent specified in the Notice of Termination;
2. Place no further orders or Subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the Work under this Contract as is not terminated;
3. Terminate all orders and Subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;
4. Settle all outstanding liabilities and all Claims arising out of such termination of orders and Subcontracts, subject to the approval of County;
5. Complete performance of such part of the Work as shall not have been terminated by the Notice of Termination; and
6. Take such action as may be necessary, or as County may direct, for the protection and preservation of the property related to this Contract which is in the possession of Contractor and in which County has, or may acquire, an interest.
(c) After receipt of a Notice of Termination, Contractor shall submit to County a verified termination Claim. Such Claim shall be submitted promptly, but in no event later than thirty (30) days from the effective date of termination, unless one (1) or more extensions, in writing, are granted by County upon request of Contractor made, in writing, within such period or authorized extension of the period.
(d) Contractor and County may agree upon the whole or any part of the amount or amounts to be paid to Contractor by reason of the total or partial termination of Work pursuant to this article, which amount or amounts may include a reasonable allowance for profit on Work done; provided that total Contract Sum as reduced by the amount of payments otherwise made and as further reduced by Contract Sum of Work not terminated does not exceed the Contract Sum.

34.07 Contingent Assignment Of Subcontracts

A. Contractor hereby assigns to Owner each Subcontract for a portion of the Work, provided that:
1. The assignment is effective only after Owner's termination of Contractor's right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) as set forth herein.
2. The assignment is effective only for the Subcontracts which Owner expressly accepts by notifying the Subcontractor in writing;
3. The assignment is subject to the prior rights, if any, of the Surety, obligated by Division 006000 (Performance Bond) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;
4. After the effectiveness of an assignment, Contractor shall, at its sole cost and expense (except as otherwise provided in this Division 007100), sign all instruments and take all actions reasonably requested by Owner to evidence and confirm the effectiveness of the assignment in Owner; and
5. Nothing in this Section shall modify or limit any of Contractor's obligations to Owner arising from acts or omissions occurring before the effectiveness of any Subcontract assignment, including but not limited to all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

34.08 Limit Of Liability

A. OWNER, AND EACH OF ITS OFFICERS, BOARD MEMBERS, EMPLOYEES, CONSULTANTS AND AGENTS INCLUDING, BUT NOT LIMITED TO, PROJECT

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MANAGER AND ALL OTHER OWNER REPRESENTATIVES, SHALL HAVE NO LIABILITY TO CONTRACTOR FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, EXCEPT TO THE LIMITED EXTENT THAT THESE CONTRACT DOCUMENTS OR APPLICABLE PUBLIC CONTRACTING STATUTES MAY SPECIFY THEIR RECOVERY.

ARTICLE 35 WARRANTIES

35.01 Warranty And Guaranty

A. General Representations and Warranties: Contractor represents and warrants that it is and will be at all times fully qualified and capable of performing every Phase of the Work and to complete Work in accordance with the terms of the Contract Documents. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of the Contract Documents. Contractor warrants that Work, including but not limited to each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in engineering, materials, construction and workmanship. Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses, and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by the Contract Documents.

B. Extended Guarantees: Any guarantee exceeding one (1) year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor shall supply Owner with all warranty and guarantee documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.

C. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this Section are effective continuously during Contractor's Work on the Project and following cessation of labor for any reason including, but not limited to, Project completion. Contractor covenants, warrants and represents to Owner that:

1. To Contractor's knowledge after due inquiry, no lead or asbestos containing materials were installed or discovered in the Project at any time during Contractor's construction thereof. If any lead or asbestos containing materials were discovered, Contractor made immediate written disclosure to Owner.
2. To Contractor's knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment containing PCBs are or were located on the Project at any time during Contractor's construction thereof.
3. To Contractor's knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor's construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to Owner.
4. Contractor's operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any Work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide Owner with copies thereof.

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35.02 Title free of liens at time of each progress payment. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by an application for payment, whether incorporated in the Project or not, will pass to County upon the receipt of such payment by Contractor, free and clear of all liens, Claims, security interests, or encumbrances.

35.03 Warranty as to liens. No materials, supplies, or equipment for Work under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other Agreement by which an interest therein or in any part thereof is retained by seller or supplier. Contractor warrants good title to all materials, supplies, and equipment installed or incorporated in the Work and agrees upon completion of all Work to deliver the premises, together with all Improvements and appurtenances constructed or placed thereon by Contractor, to County free from Claims, liens, or charges. Contractor further agrees that neither Contractor, nor any person, firm, or corporation furnishing any materials or labor for any Work covered by this Contract, shall have any right to any lien upon the premises or any Improvement or appurtenance thereon. Nothing contained in this article, however, shall defeat or impair the right of persons furnishing material or labor under any Bond given Contractor for their protection or any rights under any law permitting such persons to look to funds due Contractor in the hands of County, and this provision shall be inserted in all Subcontracts and material Contracts and notice of its provisions shall be given to all persons furnishing material for Work when no formal Contract is entered into for such material.

35.04 Other warranties. In addition to the warranties in the Contract Documents, Contractor shall assign to County through Architect all assignable warranties it obtains from manufacturers or suppliers with respect to any materials, equipment, or fixtures incorporated into the Work, but the assignment shall not relieve Contractor of any of its guaranties or obligations. Contractor's guaranties and the Contract Documents shall not act as a bar to Contractor's liability for any third-party Claim against Contractor, and are in addition to, not exclusive of, Contractor's other obligations under the Contract Documents, including, without limitation, Contractor's obligation to indemnify and defend County and Architect.

35.05 No limitations. Nothing in this Article 35 shall be construed to establish a period of limitation with respect to any latent or patent defects in the Work or Claims or liabilities arising therefrom. The establishment of time periods relates only to the specific obligation of Contractor to correct or cause correction of the Work and has no relationship to the time within which its 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 Contractor's liability with respect to its obligations under the Contract Documents or in connection with the Work.

PART VII MISCELLANEOUS

ARTICLE 36 MISCELLANEOUS PROVISIONS

36.01 Audits. If this Contract involves the expenditure of public funds in excess of $10,000, the contracting parties shall be subject to the examination and audit in accordance with applicable local, state, and federal regulations and the State Auditor of the State of California for a minimum period of three (3) years after final payment under the Contract, as required by Government Code Section 8546.7. The examination and audit shall be confined to those matters connected with the performance of the Contract, including, but not limited to, the costs of administering the Contract.

With respect to any Change in the Work, other than based on an agreed lump sum price, resulting in an increase in the Contract Sum or extension of the Contract Time, Contractor shall cause its Subcontractors and Sub-subcontractors to afford access to County at all reasonable times to any books, correspondence, instructions, receipts, vouchers, memoranda, and records of any kind relating thereto, all of which each of them shall maintain for a period of at least three (3) years from and after the date County makes final payment on account of such Change in the Work. Contractor and its Subcontractors and Sub-subcontractors shall make the same available within three (3) calendar days following notification to Contractor of County's intent to audit, failing which Contractor's Claim for an increase in the Contract sum and/or extension of the Contract Time, as applicable, shall be disallowed, and Contractor shall have no recourse on account of such disallowance. Contractor authorizes County, and shall cause its Subcontractors and Sub-subcontractors to authorize County, to check directly with any suppliers of labor and material with respect to any item chargeable to County under this Article, to confirm balances due and to obtain sworn statements and waivers of lien, all if County so elects.

36.02 Governing law. This Contract shall be governed by the law of the State of California.

36.03 No assignment. Neither party to this Contract shall assign this Contract without the written consent of the other, nor shall Contractor assign any monies due or to become due to him/her/it hereunder, without the previous written consent of County. Should any money due or to become due under this Contract be assigned, it shall be subject to a prior lien for services rendered or material supplied for performance of Work under this Contract in favor of all persons, firms, or corporations rendering such services or supplying such materials to the extent that Claims are filed pursuant to the Civil Code, the Code of Civil Procedure, and/or the Government Code.

36.04 Binding on successors and assigns. County and Contractor each binds himself/herself/itself, 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 in respect to all covenants, Agreements, and obligations contained in the Contract Documents.

36.05 Contractual rights and remedies not exclusive. 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, except as otherwise specified herein.

36.06 Assignment of antitrust causes of action. Contractor and all Subcontractors are bound by Public Contract Code Section 7103.5, which provides as follows:

> In entering into a Public Works Contract or a Subcontract to supply goods, services, or materials pursuant to a Public Works Contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 USC Section 15) or under the Cartwright Act (Chapter 2, commencing with Section 16700, of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Public Works Contract or the Subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to Contractor, without further acknowledgment by the parties.

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36.07 Royalties and patents. Contractor shall pay all royalties and license fees. Contractor shall defend all suits or Claims for infringement of any patent rights and shall save County, harmless from loss on account thereof, except that County shall be responsible for all such loss when a particular design, process, or the product of a particular manufacturer or manufacturers is specified but if the Contractor has reason to believe that the design, process, or product specified is an infringement of a patent, Contractor shall be responsible for such loss unless Contractor promptly gives such information to Architect through the Construction Manager.

36.08 Prohibited interests. No official of County who is authorized in such capacity and on behalf of County to negotiate, make, accept, or approve, or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply Contract or any Subcontract in connection with the Project, shall become directly or indirectly interested financially in this Contract or in any part thereof. No officer, employee, architect, attorney, engineer, or inspector of or for County who is authorized in such capacity and on behalf of County to exercise any executive supervisory or other similar functions in connection with construction of the Project shall become directly or indirectly interested financially in this Contract or in any part thereof.

36.09. No continuing waiver. A waiver of rights by County or Contractor in one (1) instance hereunder does not constitute a waiver of rights in any similar instance thereafter.

36.10 Taxable possessory interest. The terms of this instrument may result in the creation of a possessory interest. If such a possessory interest is vested in a private party to this instrument, the private party may be subjected to the payment of personal property taxes levied on such interest.

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SUPPLEMENTARY CONDITIONS
(Division 007300)

The supplementary conditions below are included as part of the contract for the Project.

1. Starting and completion date. Under Article 12 of the General Conditions, Contractor shall commence and complete work within the following time limits:

The duration to execute the scope of work for the above project is Four Hundred Eighty (480) days as it pertains to Contractor's Scope of Work for base bid and accepted alternates defined by the Contract Documents. Additionally, Contractor shall coordinate its work with all other Contractors whose work is affected by the Scope of Work defined in this Agreement. Contractor expressly agrees to provide appropriate labor, material, and equipment in response to adjustments in the Project Schedule made by Architect and Construction Manager during the course of the Project in order to maintain the required progress.

2. Hours of work. Work will not commence earlier than 7:00 a.m. nor proceed past 5:00 p.m. without written consent of County.

3. Site access. The adjacent sites are occupied and active: County Probation Department Youth Center. Contractor shall secure project site with temporary fencing to insure separation between business and construction activities.

4. Site restoration. All lawn, landscaping, pavement, and trees are to be protected from construction equipment and/or vehicles. Any compaction, gouging, tearing, removal, or dislocation of the existing lawn or trees that occurs during the staging and construction process is to be restored to preconstruction quality. Contractor's laydown area shall be restored back to original condition at completion of work activities.

5. Utilities, disruption of service. Contractor shall notify Construction Manager, in writing, two (2) workdays in advance of any disruption of service, e.g., fire suppression, electrical, water, and Contractor shall not proceed with the work without written authorization from Construction Manager.

6. Contractor parking. Contractor will be designated a staging area which can be used for delivery of materials and construction vehicles. Barricades must be placed showing Contractor's name to reserve the spaces when Contractor's vehicles are not at the site either during the day or overnight for the next morning.

7. Noise during construction. Not restricted within established Hours of Work

8. Liquidated damages. Pursuant to the Agreement and Article 12 of the General Conditions, the amount of liquidated damages shall be **Two Thousand Five Hundred Dollars ($2500) per day.**

9. Agreement and bonds. Contractor will provide the specified number of originals for each of the following:

Four (4)	Executed Contracts	One (1)	Performance Bond
One (1)	Payment Bond	One (1)	Certificate of Liability Insurance with Endorsements

10. Contract Documents furnished to Contractor. The number of originals of the Contract Documents to be provided under Article 3 of the General Conditions is as follows:

One (1) fully executed Contract
One (1) each Addendum
One (1) Plans and Specifications

11. Supervision. Section 9.04 of the General Conditions require that Contractor employ a competent, qualified Superintendent to provide full time, on-site supervision of all aspects of the Work and further require that such Superintendent and Contractor's Project Manager be satisfactory to County. If Contractor fails to have such Superintendent on-site at any time during the progress of the Work, a penalty of One Thousand Dollars ($1,000.00) per day shall be deducted from the compensation otherwise due to Contractor for each day on which such failure occurs. Such penalty shall not apply to temporary absences approved in advance by Architect or County.

12. Owner's representative Article 6 and 9. All coordination must be made with Construction Manager. All communication with Construction Manager must be made by Contractor's Superintendent or Contractor's Project Manager to maintain control and to prevent misunderstandings. All communication with Contractor and Construction Manager will be in writing.

13. Determining cost for Change Orders. Section 18.04 of the General Conditions designates the maximum markup(s) allowed by County.

14. Material Safety Data Sheets (MSDS). Article 17 and 20. MSDS sheets are required on-site for all materials used in the job.

15. As-built Drawings. Per General Conditions, Contractor will be required to maintain a current set of as-built Drawings throughout the duration of the Project. Upon final completion of the Project as outlined in Article 23 of the General Conditions, Contractor will be responsible to provide the close-out documents to Construction Manager as follows:

One (1)	Half-size, complete as-built Drawing set showing all information from Contractor, Subcontractor(s), and Sub-Subcontractor(s).
Two (2)	CD's and digital download files with complete as-built Drawings, Operations & Maintenance Manual, and Warranty Certifications (with required contact names, addresses, and telephone numbers) in pdf format.
Two (2)	Printed Operation & Maintenance Manuals for all installed materials and equipment. Manuals shall include table of contents organized by division.
Two (2)	Printed Warranty Certifications as noted in the Project Manual with required contact names, addresses and phone numbers.

16. Partnering. This Contract imposes an obligation of good faith and fair dealing in its performance and enforcement. County intends to encourage the foundation of a cohesive partnership with Contractor and its principal Subcontractors and suppliers. The objectives are effective and efficient Contract performance and completion within budget, on schedule, and in accordance with the Contract Documents.

17. Meetings. Contractor will be responsible for attending brief weekly meetings during this Contract. The meetings shall be attended by Contractor's Project Superintendent and/or Project

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Manager and will be located on-site. Contractor shall bear the administrative costs of their attendance.

18. Submittal Schedule. Upon receipt of the Notice of Conditional Award letter, Contractor shall prepare and update it as necessary to maintain a current Submittal Schedule which will be due to Architect and Construction Manager no later than County's projected Notice to Proceed date as listed in County's overall Project Schedule. Contractor shall make revisions to the Submittal Schedule as deemed necessary by the Construction Manager to conform to the Project Schedule.

19. Permits. All required permits to start Project will be obtained by Construction Manager, but paid for directly by County. The Contractor shall secure and pay for other permits, fees, licenses and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after the execution of the Contract and legally required at the time bids are received or negotiations concluded.

20. Time Extension. No extension of time will be allowed for a schedule delay caused by Contractor's failure or neglect to construct and maintain all weather protection. No extension of time will be allowed for "normal" weather conditions for the particular time of the year.

21. Codes and Standards. Project shall conform to applicable requirements prescribed by governmental bodies having jurisdiction and in accordance with those listed on the drawings produced by the Architect, THE PAUL DAVIS PARTNERSHIP, LLP, for this Project. Should any part of the design fail to comply with such requirements, the discrepancy shall be called to the attention of the Architect and Construction Manager as quickly as possible. Should there be any direct conflict between the drawings and/or specifications and the above rules and regulations, the rules and regulations shall take precedence. However, when the indicated materials, workmanship, arrangement, or construction is of a superior quality or capacity to that required by the listed rules and regulations, the drawings and/or specifications shall take precedence. The rulings and interpretations of enforcing agencies shall be considered as part of the regulations.

MONTEREY COUNTY

PUBLIC WORKS, FACILITIES & PARKS

VOLUME TWO OF TWO

PROJECT MANUAL

331 NORTH SANBORN ROAD-ALISAL INTEGRATED HEALTH CENTER
PROJECT NO. 1701
BID NO. 10817

PROJECT MANUAL
VOLUME 2
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SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Requests for Information (RFIs).

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

1.3 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.

11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.

    1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five (5) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

    1. The following Contractor-generated RFIs will be returned without action:

        a. Requests for approval of submittals.
        b. Requests for approval of substitutions.
        c. Requests for approval of Contractor's means and methods.
        d. Requests for coordination information already indicated in the Contract Documents.
        e. Requests for adjustments in the Contract Time or the Contract Sum.
        f. Requests for interpretation of Architect's actions on submittals.
        g. Incomplete RFIs or inaccurately prepared RFIs.

    2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
    3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

        a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architectin writing within [**10**] ten days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:

    1. Project name.
    2. Name and address of Contractor.
    3. Name and address of Architect.
    4. RFI number including RFIs that were returned without action or withdrawn.
    5. RFI description.
    6. Date the RFI was submitted.
    7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven (7) days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of constructionduring performance of the Work, including the following:
   1. Initial construction schedule.
   2. Contractor's Master Construction Schedule.
   3. Construction schedule updating.
   4. Daily construction reports.
   5. Material location reports.
   6. Site condition reports.
   7. Unusual event reports.

B. Development of schedules, and schedule updates, and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling software stated in Section 1.06 below.

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 andresources.
   1. Critical Activity: An activity on the critical path that must start and finish on the planned early startand 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 canbe performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule thatestablishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.
   1. Float time is not for the exclusive use or benefit of either County or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestonesand Contract completion date.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early startof the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affectingthe planned Project completion date.

F. Concurrent Delay: Two or more delays that take place or overlap during the same period, either of which occurring alone would have affected the ultimate completion date. The term “same period” does not mean that both delays start and end on the exact same dates. Rather, the term means that the two or more delays overlap one another for one or more days. This overlapping time is the concurrency of delay. 1. For concurrency, there must be:
   a. Two or more delays that are unrelated, independent and would have delayed the projecteven if the other delay did not exist;
   b. Two or more delays that are the contractual responsibility of different parties, but one maybe a force majeure event;
   c. The delayed work must be substantial and not easily curable.

2. If the Concurrent Delay is on the critical path, where both parties contribute to the delays, theContractor is granted an extension of Contract Time with no compensation for delay related damages. Neither party shall benefit or profit from their own mistakes.

G. Contractor Delay: Delay event caused by the Contractor (subcontractor, vendor or any tier of the Contractor) or the risk of which has been assigned solely to the Contractor. If the Contractor Delay is on the critical path, in the absence of other type of concurrent excusable delay, the Contractor is granted neither an extension of Contract Time nor additional compensation for delay related damages. Such a delay may expose the Contractor to a claim for damages from the Owner.

H. Contemporaneous Period Analysis Method: The Contemporaneous Period Analysis evaluates delays or gains in the period in which it occurred. The analysis period for the purpose of these provisions shall be the period covered in each regular progress update to the schedule.

I. Controlling activity: Construction activity that will extend the scheduled completion date if delayed.

J. CPM Schedule Revision: Revisions to the CPM Schedules to ensure compliance with the Contract documents, accurately reflects the current project conditions, progress of work completed, and means and methods of how the project is to be executed, including modifications made to activities in the current CPMschedule in any of the following items: (a) activity durations; (b) changes in logic sequences between activities; (c) changes in constraints; (d) changes in activity descriptions; (e) activity additions or deletions; (f) changes in activity coding assignments; (g) changes in calendar assignments. CPM Schedule submittal that fails to comply with the Contract requirements, accurately reflects the current project conditions, progress of work completed or means and methods, will require a CPM Schedule revision.

K. Day: Calendar day, unless otherwise indicated.

L. Data Date: The date used as the starting point for schedule calculations. For the baseline CPM schedule,the Data Date is the first day of Contract Time. For Monthly CPM Schedule updates, the Data Date shall coincide with the first (1st) working day of each month, unless directed otherwise.

M. Fragnet: A sequence of new and/or activity revisions that are proposed to be added to the approved baseline detailed Master CPM Schedule or approved current Monthly CPM Schedule in effect at the time the change or delay is encountered to demonstrate the influence of the delay and the method for incorporating the delay and its impact into the schedule as they are encountered.

N. Force Majeure Delay: Delay events caused by something or someone other than the Owner (including itsagents), or the Contractor (or its agents), or the risk of which has not been assigned solely to the Owner orthe Contractor by the Contract language. If the Force Majeure Delay is on the critical path, the Contractoris granted an extension of Contract Time but does not receive additional compensation for delay related damages even if there is a concurrent delay. Force Majeure Delays are non-compensable. Examples of Force Majeure Delays include, but not limited to: delays caused by Acts of God, epidemics or out breaks of any kind, quarantines, extreme weather, government regulations or acts, acts of war, acts of terrorism or other emergencies, extraordinary economic disruptions, riots, material embargos or shortages, labor stoppages, or any other unforeseen uncontrollable externally caused event.

O. Initial Critical Path Method (CPM) Schedule: Baseline schedule that reflects how the Contractor plans to execute the work during the first one hundred and twenty (120) days of the Contract while the full baseline schedule is still in the development, review and acceptance process.

P. Look-Ahead Schedule: Three week segment of the current upcoming plan work from the accepted MonthlyCPM Update Schedule. Includes, but not limited to, forecast of the current plan week and two additional weeks beyond, the start and or finishes dates to Contractor's plan work, Subcontractor's plan work, dates of major equipment or crew mobilizations, dates when major materials are planned for delivery, key plan inspections, and testing dates, key submission dates of Shop Drawings, submittal documents and mock- ups, plan coordination dates with Architect, County or third party entities, start and or finish date of key project milestones.

1. The Look-Ahead Schedule should also record the previous week's as-built dates of work and events started and or completed, non-working days due to weather. Look-Ahead Schedule shouldbe prepared and distributed to the County and Architect each week during construction and provided at least 2-working days in advance of Weekly Construction Meetings.

Q. Master Critical Path Method (CPM) Schedule: Baseline schedule that reflects the Contractor's complete plan for executing the work from the first Contract working day extending through Substantial completion, and Final Completion.

R. Monthly Critical Path Method (CPM) Update Schedule: Adjustments to the Master CPM Schedule that reflect that status of activities that have commenced or have been completed, including the following items: (a) actual activity start date and or completion date as appropriate; (b) actual Remaining Duration for activities commenced and not completed; (c) actual physical percent complete for activity commenced and not completed; (c) on activities of work completed, predecessor and successor sequences are adjusted to reflect actual as-built sequence executed; (d) on activities of work in-progress or not completed, predecessor and successor sequences are adjusted to reflect the Contractor's current proposed plan for executing remaining work for project completion; (e) required time of completion as established by the Contract or amended through Change Order.

S. Near Critical Activity: A non-critical activity with a Total Float value within 10-working days of the critical path.

T. County Delay: Delay event caused by the Owner, or the risk of which has been assigned solely to the County. If the County Delay is on the critical path, in the absence of other types of concurrent delays, the Contractor is granted both extension of Contract Time and additional compensation for delay related damages, such as extended job overhead.

U. Predecessor Activity: Activities that are required for the start of a given activity are known as predecessor activities.

V. Preferential Sequencing: Logic dependency defined by preference, rather than necessity. Sequencing work over and above those sequences indicated in or required by Contract documents or required by the physical necessity of the materials and design.

W. Remaining Duration: The time (working days) needed to complete an activity in progress.

X. Successor Activity: Activities that follow the start or completion of a given activity are known assuccessors.

Y. Time Impact Analysis (TIA): Analysis using an accepted CPM schedule developed specifically to demonstrate the effect a proposed or past change or delay on the current scheduled completion date.

Z. Work Breakdown Structure (WBS): A deliverable-oriented grouping of project elements, which organizesand defines the total scope of the project. Each descending level represents an increasingly detailed definition of a project component.

AA. Work Day: Monday through Friday, excluding legal holidays and any other day the County defines as a non-work day.

1.03 INFORMATIONAL SUBMITTALS

A. Format for Submittals:
   1. With every CPM Schedule Submittal, submit a working electronic copy of the Primavera P6 schedule file.
   2. PDF file viewing all activities of plan work.
   3. PDF file of the current forecasted longest critical path activities.

B. Initial startup construction schedule.

C. Startup Network Diagram: Of size required to display entire network for entire construction period. Showlogic ties for activities.

D. Contractor's Master Construction Schedule: Master schedule, of size required to display entire schedule for entire construction period.
   1. Submit a working digital copy of schedule, using software indicated, and labeled to comply withrequirements for submittals.

E. 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.
   1. Activity Report: List of activities sorted by activity number and then early start date, or actual startdate if known.
   2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascendingorder by activity number and then by early start date, or actual start date if known.
   3. Total Float Report: List of activities sorted in ascending order of total float.
   4. Other reports indicated.

F. Construction Schedule Updating Reports: Submit along with CPM Monthly Update Schedules.

G. Daily Construction Reports: Submit at weekly intervals.

H. Material Location Reports: Submit at monthly intervals.

I. Site Condition Reports: Submit at time of discovery of differing conditions.

J. Unusual Event Reports: Submit at time of unusual event.

K. Qualification Data: For scheduling employee or consultant.

1.04 QUALITY ASSURANCE

A. Contractor’s Construction Scheduler:
   1. The Contractor is required to employ or retain the services of a Construction Scheduler. The Construction Scheduler shall have a least five (5) years of verifiable experience as the person primarily responsible for preparing and maintaining detailed project schedules on project of the same or similar size and nature as this project. The Construction Scheduler is required to attend all meetings pertaining to scheduling and progress of the work. If the Construction Scheduler leaves the employment of the

Contractor, the Contractor will be required to fulfill the requirements of paragraph 2) below within thirty (30) days. (As used in this Article, "days" mean consecutive calendar days unless otherwise noted.)

2. At least 10 days prior to the scheduled Preconstruction Conference, the Contractor shall provide a resume to the County with the following:
   a. Identification, qualifications, and experience of the Contractor's Construction Scheduler.
   b. References of not less than two (2) previous projects on which the Contractor's Construction Scheduler has utilized CPM Scheduling.
   c. A description of the Scheduling System to be utilized
3. Additional Contractor Scheduler Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.
4. All costs associated with the Contractor's preparation, development, and analysis of the schedules and reports as described herein, shall be included in the Contractor's cost of the work. No additional payments are justified for responsibilities performed by the Contractor's construction scheduler.
5. The Architect and County reserve the right to disapprove any candidate and remove, without rights to the Project, any member of the Contractor's scheduling staff that is, in the Architect's or County's opinion, incompetent in scheduling.

B. Prescheduling Conference (date and time to be determined by the County): Conduct conference to review method and procedures related to the preliminary schedule and the Contractor's construction schedule, including, but not limited to, the following:
   1. Verify availability of qualified personnel needed to develop and update schedule.
   2. Discuss constraints, including phasing, work stages, area separations, interim milestones, andpartial County occupancy.
   3. Review delivery dates for County-furnished products.
   4. Review schedule for work of County's separate contracts.
   5. Review submittal requirements and procedures.
   6. Review time required for review of submittals and resubmittals.
   7. Review requirements for tests and inspections by DSA, Project Inspector (IOR), and otherindependent testing and inspecting agencies.
   8. Procedures and review time required for Project closeout and County startuprequirements, including commissioning activities.
   9. Review the Contractor's schedule concept for work construction. Discuss key schedule coordination with subcontractors, vendors, and County. Discuss key material procurements.
   10. Review procedures for updating schedule.

C. Work Breakdown Structure
   1. Submit to the Architect and County for approval, at the Prescheduling Conference, the proposed Work Breakdown Structure (WBS) along with alpha-numeric coding and labeling of work activities. A multi-level hierarchy Work Breakdown Structure (WBS) shall be incorporated as follows:
      a. Level 1 is project level.
      b. Level 2 shall be broken into three parts, Construction, Commissioning, and Post Construction.
      c. Level 3, Construction activities shall be into categories for Administrative activities, submittalprocess (including development and submission of required Contractor Submittals, Review and Approval by Owner), procurement / fabrication and delivery of long lead materials, and Construction activities shall be broken into various areas of work within the project limits;
      d. Level 4, Construction activities shall be further broken into floor levels within the building.
      e. Level 5, Construction activities shall be further broken into specific main rooms andlocations of work for each floor level.
      f. WBS to broken down to a reasonable level of detail as requested by the County
   2. As a minimum, the following codes fields shall be include:

a. Bid Item – established by the Contractor's Schedule of Values
b. Responsibility – which entity (Contractor, Subcontractor, Vendor, County, or other) is responsible for the activity
c. Item – Specification Section Number for the Work being performed.

1.05 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.

1.06 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Computer Scheduling Software: Prepare all schedules using Primavera P6 current version or compatible version that has been developed specifically to manage construction schedules.
1. Software shall be approved by the County and Architect.
2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.

B. All construction schedules shall be based on and incorporate all milestones and completion dates specified in the Contract Documents. Show in the schedule the sequence in which the Contractor proposes to perform the Work and dates on which the Contractor contemplates starting and completing allschedule activities. The scheduling of the entire project is required. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the Project shall also contribute in developing and maintaining an accurate Project Schedule. Provide a Project Schedule that isa forward planning as well as a project monitoring tool.

C. Time Frame: Extend schedule from date established for the Notice of Proceed to date of FinalCompletion.
1. Contract completion date shall not be changed by submission of a schedule that shows an earlycompletion date, unless specifically authorized by Change Order.

D. Use the approved Project Schedule to measure the progress of the Work and to aid in evaluating timeextensions.

E. If the Contractor fails to submit any schedule within the time prescribed, the County may withhold approval of progress payments until the Contractor submits the required schedule.
1. $250 per day for failure to submit the Initial Critical Path Method (CPM) Schedule, Master CPM schedule, CPM Monthly Update Schedules, or schedule revisions.

F. Project Schedules shall indicate the beginning and completion of all Work and shall use the "Critical pathMethod" for the value reporting, planning and scheduling of all Work required under the Contract Documents. All Work activity durations shall be in Workdays.
1. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.

G. Activities: Treat each floor or separate area as a separate numbered activity for each main element of theWork. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 10 work days, unless specificallyallowed by County. Exceptions to activities representing: material procurements or fabrications, Contractor's submittal preparation and development,

County's review and approval of submittal, and activities associated with equipment start-up, testing, and commissioning.

2. All activities shall be identified through codes or other identification to indicate the portion of Workand Contractor/Subcontractor responsibility to which they pertain.
   a. Provide activity coding to enable sorting by responsibility, location, Work Restriction, and CSI division. Assign activity codes to any activity or sequence of activities added to the Project Schedule as a result of a Change Orders, when approved by the County with a Change Order code. Integrate the code values to the Contractor's numbering system. An activity shall not have more than one Change Order code.
3. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 45 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
   a. All Contractor, Subcontractor and assigned Contractor work shall be shown in a logical work sequence that demonstrates a coordinated plan of work for all contractors. The intent is to provide a common basis of acceptance, understanding and communication, as well as interface with other contractors.
   b. Show County and other agency activities that could impact progress. These activities include, but are not limited to: approvals, submittal reviews, and environmental permit approvals by State regulators, inspections, DSA activities, and utility tie-in.
4. Submittal Schedule and Review Time: Include schedule of submittal items, review and resubmittal times as line-item activities. Allow 10 days for the Architect's and County's initial review and 5 days for resubmittals. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule so that submittals do not become critical path for the work.
5. Mockup and Testing Plan: Include building of mockup and applicable requirements found in sections 08 44 13, Glazed Aluminum Curtain Walls, 09 24 00 Cement Plastering, and 07 46 00 Siding. Include activities for:
   a. Mockup submittals.
   b. Delegated design and deferred approval.
   c. Out-of-sequence fabrication, construction and erection.d. Testing and inspections.
   d. Architect and County review – allow 10 days for initial review, 7 days for Contractor corrections, and 5 days for final review. (If corrections are not made by the Contractor, additional time will be required until such time all corrections are made and accepted by the architect and County.
6. Startup and Testing Time: Include no fewer than 15 work days for startup and testing for each system; unless otherwise specified in the Contract Documents.
7. Commissioning Time: Include no fewer than 15 work days for commissioning of each system, or as may be noted in the commissioning requirements for the project.
8. Notice of Substantial Completion and Final Completion: Indicate completion in advance of dateestablished for Substantial and Final Completion, to allow time for Architect's administrative procedures necessary for closeout submittal review, certification and punch list review.
9. Punch List and Final Completion: Include days for completion of punch list items and finalcompletion as indicated in Section 01 77 00 "Project Closeout."

H. Constraints: Include constraints and work restrictions indicated in the Contract Documents to show how the planned sequence of the Work is affected.
   1. Work by County: Include a separate activity, if any, for each portion of the Work performed by County.
   2. Products Ordered in Advance: Include a separate activity for each product, including delivery date.
   3. County-Furnished Products: Include a separate activity for each product, including delivery dates needed to meet construction.
   4. Delivery dates indicated shall stipulate the earliest possible delivery date.

5. Work Restrictions: Show the effect of the following items on the schedule, as applicable:
   a. Coordination with existing construction.
   b. Limitations of continued occupancies.
   c. Uninterruptible services.
   d. Partial occupancy before Notice of Completion.
   e. Use-of-premises restrictions.
   f. Provisions for future construction.
   g. Seasonal variations.
   h. Environmental control.

I. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Submittals.
   b. Equipment Purchases.
   c. Mockups.
   d. Fabrication.
   e. Sample testing.
   f. Material Deliveries.
   g. Key equipment mobilization and setup.
   i. Interfaces / coordination with outside entities.j. ~~Erection and removal of shoring~~.
   k. Crane Installation.
   l. Tests and inspections.
   m. Site winterization activities
   n. Curing.
   n. Building flush-out, if required by Calgreen Tier 1 or commissioning requirements.
   o. Startup and placement into final use and operation.p. Commissioning.
   q. Initial, Pre-Final, and Final Punch Lists.r. Final cleanup.
   s. Record Documents
   t. Project Closeout.
   u. Substantial Completion.
   v. Final Completion.

J. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Temporary enclosure and space conditioning, if required by weather.
   c. Permanent space enclosure.
   d. Completion of mechanical installation.
   e. Completion of electrical installation.
   f. Completion of plumbing installation.
   g. Completion of interior finishes.
   h. Establishment of building permanent power
   i. Completion prior to issuance of Notice of Completion

K. Schedule Format for Initial CPM Schedule and Master CPM Schedule (Baseline), include:
   a. Order that the Contractor propose to prosecute the work starting with the first Contractworking day and extending to Substantial Completion and Final Completion.
   b. Logical predecessor and successor links between plan work activities.c. All controlling activities.
   d. Legible description of each activity.
   e. At least 1 predecessor and 1 successor to each activity except for project start and projectend milestones.
   f. Duration of at least 1 working day for each activity.

g. Activity planning duration shall not be longer than 10 work days, unless specifically allowed by the Architect. Exception to activities representing: material procurements or fabrications, Contractor's submittal preparation and development, County's review and approval of submittal, and activities associated with equipment start-up, testing, and commissioning.

h. Milestones shall be included to represent the start of Contract Time, Substantial Completion, Final Completion, significant events, such as, but not limited to, system start-up and completion, project staging or phasing of work.

i. The baseline schedule must show the activities that define the critical path. Multiple critical paths and near-critical paths must be kept to a minimum. A total of not more than 50 percentof the baseline schedule activities must be critical or near critical unless otherwise authorized.

j. The baseline schedule must not extend beyond the number of original working days. Baseline schedule shall show no completed work to date.

k. Baseline schedule shall show no negative float or negative lag on any activity. l. Baseline schedules shall include all work contained in the contract documents.

m. Sufficient activities shall be included to insure adequate planning for the entire project; reasonable level of detail as requested by the County. The appropriate number of activities will be largely dependent upon the nature, size, and complexity of the project.

n. With each CPM Schedule submittal, include:

1) Plotted original, time-scaled network diagram, clearly showing the full schedule of work activities on a sheet at least 11 by 17 inches with a title block. Also provided aseparate plot of the critical path activities on 11x17 inch sheets.
2) Schedule narrative
3) Electronic schedule file
4) Schedule Comparison Report of schedule changes performed on CPM Schedulerevisions.
5) Other Reports requested in this specification.

L. Failure of the Contractor to provide all required information will result in the disapproval of the Initial, Master and subsequent updates of the Master CPM Schedule. In the event Project Schedule revisions are directed by the County and those revisions have not been included in subsequent revisions or updates, the County may hold retainage up to the maximum allowed by Contract,each payment period, until such revisions to the Master CPM Schedule have been made; refer to Section 1.06(E) above.

M. No Project Schedule shall exceed time limits set forth in the Contract Documents. Failure to submit a schedule, or submittal of a Project Schedule which shows completion of the Work beyond the specifiedcompletion date without approval by the County shall be deemed a material breach by the Contractor.

N. Overall time of completion between the Notice to Proceed to Final Completion shown on any Project Schedule shall adhere to completion times as stated in the Contract. If an earlier (advanced) time of completion is requested by the Contractor in the submission of the Initial CPM Schedule or Master CPM Schedule, then any of the following conditions may be applied by the County.

1. County is not required to accept an advanced schedule, e.g., one that shows an early completion date to the Substantial Completion or Final Completion milestones.
2. In the event agreement is reached between Contractor and County on an advanced schedule, Contractor shall not be entitled to extra compensation if Contractor completes its Work, for whatever reason (excepting approved changes with added time components) beyond completiondate(s) shown in any approved advanced schedule but still within the originally specified completion dates.
3. The County may elect to revise the original dates on Final Completion requirements based on the new agreed early completion dates. If so, this changes

will be formalized through Change Order.

4. Contractor shall not submit a schedule showing early completion without indicating float timethrough the date set for Project completion by County.
5. Contractor's schedule shall account for all days past early completion as float which belongs to theProject. Usage of float shall not entitle the Contractor to any delay claim or damages due to delay.

6. If the County allows an advanced schedule, and if the Contractor submits an early completion baseline schedule that shows work completion in less than 85 percent of the original calendar days, the baseline schedule shall be supplemented with resource allocations for every task activity and include time-scaled resource histograms. Resource allocations must be shown to a level of detail that facilitates report generation based on labor crafts and equipment classes for the Contractor and Subcontractors.
   a. Use average composite crews to display the labor loading of job site construction activities.Optimize and level labor to reflect a reasonable plan for accomplishing the work and to assure that resources are not duplicated in concurrent activities.
   b. The time-scaled resource histograms must show labor crafts and equipment classes to beused.

O. Float Ownership: Neither the County nor the Contractor owns float. The Project owns the float. As such, liability for delay of the Substantial Completion Date(s) rests with the party whose actions, last in time, actually cause delay to the Substantial Completion Date(s).
   1. For example, if Party A uses some, but not all of the float and Party B later uses remainder of the float as well as additional time beyond the float, Party B shall be liable for the time that represents adelay to the Substantial Completion Date.
   2. Party A would not be responsible for the time since it did not consume the entire float andadditional float remained; therefore, the Substantial Completion Date was unaffected.

P. Pursuant to float sharing requirements stated in this Contract, the use of float suppression techniques, identified below, but not limited to, are prohibited. The use of float suppression (sequestering) shall be cause for rejection of the schedule submittal. As stated in the Contract, float shall be shared to benefit theCounty and the Contractor.
   1. Methods of suppression (sequestering) float:
      a. Preferential Sequencing – Arranging the critical path through activities more susceptible toCounty caused delays. Or arranging predecessor and successor sequences to hide or eliminate available Total Float from plan activities of work.
      b. Artificial Activity Durations – Inflated activity durations.
      c. The use of Zero Free Float Constraints – Activities appear more critical than if the activity'sTotal Float was based on early dates.
      d. Manipulation of project calendars.

N. The Architect may disapprove of any construction schedule or require modification to it if, in the opinion of the Architect or County, adherence to the construction schedule will not cause the Work to be completed inaccordance with the Agreement.

O. Recovery Schedule: When periodic update indicates the Work is 12 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. Indicate changes to working hours, working days, crewsizes, equipment required to achieve compliance, and date by which recovery will be accomplished. In addition, provide an accompanying narrative that describe the cause of the problems and the actions planned by the Contractor to recover the schedule.

P. Distribution: Distribute copies of approved schedule to Architect County, separate contractors, testing andinspecting 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.

Q. 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.

R. Any Subcontractor or Supplier with more than 5 percent of the Contract value shall review and sign off on the Baseline Schedule and all CPM Schedules submitted for review and approval. Upon request by the County or Architect, the Contractor shall provide formal documentation of review and sign-off by Contractor, Subcontractor, and Suppliers.

S. Responsibility for Completion:

1. Whenever it becomes apparent from the current monthly update progress review meeting or monthly update that the phasing milestone, constraint, restraint, or Contract completion date will not be met, the Contractor shall execute some or all of the following actions:
   a. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
   b. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
   c. Reschedule the work in conformance with the Contract Document requirements.
2. Prior to implementing any of the above actions, the Contractor shall notify and obtain approval from the County. If such actions are approved, the Contractor shall incorporate revisions into the Master CPM Schedule before the next update.
3. Under no circumstance will the addition of the equipment or construction forces, increasing the working hours or any other method, manner, or procedure to return to the contractually required completion date be considered justification for a Change Order or be treated as acceleration where the need for a recovery schedule has been caused by the Contractor and/or Subcontractors or suppliers, at any tier.
4. The County may elect to withhold progress payments until the Contractor's progress indicates that the milestone date(s) and/or the Contract completion date will be met.
5. The Contractor shall employ and supply a sufficient force of workers, material, and equipment and shall prosecute the Work with such diligence so as to maintain the rate of progress indicated on the Progress Schedule and to achieve Substantial Completion within the Contract Time.
6. Failure by the Contractor to include any element of work required by the Contract in the accepted progress schedule does not relieve the Contractor from its responsibility to perform such work. The Contractor shall not take missing work or errors in the schedule planning as acceptance by the County or as a change to the Contract documents.
7. Errors or omissions on schedules shall not relieve the Contractor from finishing all work within the time limit specified for completion of the contract. The Contractor is solely responsible for the accuracy of the schedule.
8. If, in the preparation of the progress schedule, the Contractor projects a completion date that is different than that specified in the Contract documents, this in no way voids the date set therein.

T. Baseline Narrative: With every Initial CPM Schedule and Master CPM Schedule (Baseline) Submittal, the Contractor shall prepare and submit a schedule narrative. The narrative report shall contain the following:

1. Baseline Schedule Narrative: Explanation of assumptions in the baseline schedule development including:
   a. General work sequencing and methodology, including phasing, and order of work.
   b. Crew movements, and flow of work.

c. Justification of critical path work
d. Critical equipment and manpower requirementse. Long lead equipment or material items.
f. Constraints and challenges to completing the work. g. Lags used, with a detailed explanation for each use.
h. Constraints used, with a detailed explanation for each use.
i. Coordination assumptions, both with Subcontractor, and other parties (County,Architect/Engineer, inspections, etc.)
j. Work week schedule, work hours and non-working days, including holidays.

1.07 INITIAL CRITICAL PATH METHOD (CPM) SCHEDULE

A. Within 15 calendar days following the Notice to Proceed issued by the County, Contractor shall submit an Initial CPM Schedule covering the first 60 calendar days of work.

B. County and Contractor shall meet to review and discuss the Initial CPM Schedule within 7 working days after it has been submitted to County.
1. County's review and comment on the Initial CPM schedule shall be limited to conformance with the Contract Documents (with Work sequencing, coordination, milestone requirements, and specified formatting and information requirements) and accepted CPM principals.
2. Contractor shall make corrections to the Initial CPM Schedule as necessary to comply with Contract requirements and shall adjust the schedule to incorporate any missing information as requested by County.
3. Contractor shall resubmit the Initial CPM Schedule within 5 working days when resubmission is required by the County. The County will have 5 working days to review and respond to the resubmitted Initial CPM Schedule. If an additional meeting should be required to resolve outstanding questions or schedule comments, the meeting shall take place within 5 calendars after the Contractor receives the County's formal comments to the resubmitted Initial CPM Schedule*.*

C. Initial CPM Schedule shall indicate proposed plan for the Work to be completed during the first 120 days of the Contract, including details of planned mobilization of plant and equipment, the sequence of early operations, and the procurement of materials and equipment. Show Work beyond 120 calendar days in summary form through the Contract Substantial and Final Completion dates.
1. Failure to include any work item required for performance of this Contract shall not excuseContractor from completing all work within applicable completion dates.

D. Initial CPM Schedule shall be time-scaled.

E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "earlystart-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. Immediate preceding and succeeding activities.
4. Early and late start dates.
5. Early and late finish dates.
6. Activity duration in workdays.

F. Milestones. The Initial CPM Schedule shall include milestone activities for each significant project event during the first 60 days of the Contract, including but not limited to: mobilization, temporary facilities and controls utilization procedures, key submittals and material

procurements, and commencement of construction activities .

1.08 MASTER CPM SCHEDULE

A. Within 40 calendar days following the Notice to Proceed issued by the County, Contractor shall submit a detailed Master CPM Schedule, presenting an orderly and realistic plan for completion of the Work, in conformance with requirements specified herein.

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

C. County's acceptance of the Master CPM Schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests, and shall not, in any manner, impose a duty of care upon County, or act to relieve Contractor of its responsibility for means and methods of construction.

D. Within 10 working days after the Master CPM Schedule is submitted to the County, the Contractor shall meet with the County to review the Master CPM Schedule submittal.
   1. Attendees shall include the County Representative, Architect, Contractor's Project Manager and Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by County. The meeting will take place over a continuous one-day period.
   2. County's review will be limited to submittal's conformance to Contract requirements. Review may also include:
      a. Critical path method principles and tenets utilized
      b. Clarifications of Contract Requirements
      c. Directions to include activities and information missing from the submittal
      d. Requests to Contractor to clarify its schedule
   3. Within 5 working days of the Schedule Review Meeting, Contractor shall respond in writing to allquestions and comments expressed by County at the Meeting.

E. Submit a list of anticipated non-Work days, such as weekends, holidays, and/or other observances. County and City are closed between Christmas and New Year. Contractor may work during this period, but no City or County inspections will be available during this period. Contractor’s shall schedule shall reflect this no inspection period.

F. Seasonal weather conditions (refer to Section 1.10)

G. “Weather” below shall be considered in the planning and scheduling of the work within the allotted Contract Time.

H. Contractor shall schedule all deferred approval items and shop drawings in its schedules if appropriate. IfContractor fails to include deferred approval items and shop drawings in its schedule which results in a critical path delay, then Contractor shall be subject to the assessment of liquidated damages.

I. Milestones. The Master Construction Schedule shall include milestone activities for each significant projectevent for the entire Project, including but not limited to: Rough grading complete; underground utilities complete (below slab); site utilities complete; foundations (slab on grade) complete, substructure (structural steel frame) complete; superstructure construction complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; closeout procedures and inspections, start-up, and building systems commissioning complete. In addition, establish date of Substantial Completion, periods for closeout and punch list review, inspections, and completion, record document submittal and review, and date of Final Completion.

1.09 ADJUSTMENTS TO THE MASTER CPM SCHEDULE

A. Contractor shall revise the Master CPM Schedule submittal to address all review comments from the review meeting described above, and resubmit the Master CPM Schedule for County review and approval.
   1. County, within 10 working days from date that Contractor submitted the revised Master CPMschedule, will either:
      a. Accept the Master CPM Schedule as submitted, or
      b. Return the revised Master CPM Schedule as rejected and request further correction be performed for Contract compliance. The County will advise Contractor in writing to review any part or parts of the Master CPM Schedule which either do not meet Contract requirements, or are unsatisfactory for County to purposes of monitoring Project progress, resources, and status.
         1) Within 5 working days from the date that Contractor receives the County's formal comments to the resubmitted Master CPM Schedule, the Contractor and County shall meet to resolve outstanding questions or schedule comments.
   2. County may accept the Master CPM Schedule with conditions that the first monthly update of theMaster CPM schedule will be revised to correct identified deficiencies.
   3. When the Master CPM Schedule is accepted, it shall be considered the Master CPM Schedule,which will then be immediately updated to reflect the current status of the Work.
   4. County reserves right to require Contractor to adjust, add to, or clarify any portion of the Master CPM Schedule which may later be discovered to be insufficient for monitoring the Work or approving payment requests. No additional compensation will be due to the Contractor for any such adjustments, additions, or clarifications.

B. Acceptance of Contractor's Master CPM Schedule by County will be based upon schedule's compliance with Contract requirements and accepted CPM principles.
   1. In assigning activity durations and proposing Work sequences, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the approved Master CPM Schedule.
   2. Upon submittal and County approval of any Master CPM Schedule Update, such updated schedule shall then be considered the "current" Master CPM Schedule.
   3. Submission of Contractor's Master CPM Schedule to County shall not relieve Contractor of total responsibility for scheduling, sequencing, and executing the Work to comply with requirements of Contract Documents, including recovery from adverse effects such as delays resulting from ill- timed work.`
   4. Contractor's Monthly CPM Update Schedules: Contractor shall monitor the progress of Work and anticipated the current project completion date. At monthly intervals, update the schedule to reflect actual physical construction progress and the Contractor's current sequence for executing the remaining work activities, and any changes to planned activities. Submit Monthly CPM Update Schedules for review no later than 5-days after the assigned Data Date (refer to Section 1.02(L) – the first (1st) working day of each month, unless directed otherwise). County, within 10 working days from date that Contractor submitted the CPM Monthly Update Schedule, will either:
      a. Accept the CPM Monthly Update Schedule as submitted, or
      b. Return the schedule as rejected and request further correction be performed for Contract compliance. The County will advise Contractor in writing to review any part or parts of the CPM Monthly Update Schedule which either do not meet Contract requirements, or are unsatisfactory for County to purposes of monitoring Project progress, resources, and status.
   5. Within 5 working days of the after receiving the County's formal comments, the Contractor shall resubmitted the CPM Monthly Update Schedule for review, if required, the Contractor and County shall meet to resolve any outstanding questions or schedule comments before moving on to the subsequent monthly update schedule.
   6. 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.

7. As the Work progresses, indicate final completion percentage for each activity.
8. Out-of-Sequence progress activities that are not part of the Contractor's actual plan for executingthe work shall have their predecessor and successor logic ties re-sequenced to reflect actual planning and as-built logic.

C. CPM Monthly Update Narrative: With every CPM Monthly Update Schedule Submittal, the Contractor shall prepare and submit a schedule narrative. The narrative report shall contain the following:
1. Introduction, that identifies reports included, Data Date used, schedule file name, start of ContractTime, forecasted milestone completion dates.
2. Work completed during the update period.
3. Description of the current critical path and controlling operations.
4. Changes to the critical path and scheduled completion date since the last CPM schedule submittal.
5. Explanation for Changes to Predecessor / Successor Logic Sequence.
6. Explanation to Added Lags or Constraint; detailed explanation for each use.7. Description of problem areas.
8. Current and anticipated delays, including:a. Causes of delays
   b. Impacts of delays on other activities, milestone, and completion datesc. Corrective action and schedule adjustments to correct the delays
   d. Weather delays
9. Pending items and status of:a. Permits
   b. Change Orders
   c. Time adjustments
   d. Noncompliance Noticese. Unresolved Issues:
      1) Unanswered Requests for Information.
      2) Pending critical submissions, rejected or unreturned submittals3) Pending Construction Change Directive (CCD)
10. Reason for an Early or Late Schedule Completion Date in comparison to the work completion date. 11. The Contractor should include the following reports along with CPM Monthly Update submissions:
   a. Daily Reports for work performed during the update periodb. Material Location Reports
   c. Site Condition Reports d. Unusual Events Reports

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing thefollowing:
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.

F. Monthly CPM Schedule Update shall incorporate all current information, including progress of work completed to date, accurate estimation of the Remaining Duration for completion on work activities in progress, accurate estimation of the Original Duration on remaining work activities yet to be started, approved Contract time duration, and the Contractor's proposed changes in work sequences.

G. Current updated CPM Schedules shall be developed from the accepted baseline schedule, any subsequent accepted Monthly CPM Schedule Update or revisions, or Recovery Schedule.

H. Submittal of the Master CPM Schedule, and subsequent Updates shall be understood to be the Contractor's representation that the Master CPM Schedule meets all requirements of Contract Documents, and that the Work shall be executed in the sequence and within the time indicated on the schedule.

I. Contractor shall distribute the Master CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterhead to Contractor and transmitted to County for the Project record.

J. If the County approves a change to the schedule, a written Change Order shall be forwarded to the Contractor adjusting the Contract Time or the Contract Sum, or both, as approved. All Change Orders shall be in full payment and final settlement of all claims for direct, indirect, and consequential costs related to items covered or affected, as well as time extensions.

1.10 WEATHER

A. Weather: The Baseline Schedule shall incorporate planning for normal anticipated weather as follows:

1. Within the 5-day work week (M-F) construction calendar, the Contractor shall block out the number of non-working days for each month that coincide with the Contract allotted anticipated weather days shown in the table below for the duration of the project:

Month

Anticipated Weather Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	3	3	2	1	0	0	0	0	0	1	3	3

2. Activities that are not affected by weather should not be assigned with the above 5-day work weekcalendar with normal anticipated weather.
3. If the actual number of weather days allotted for the project duration exceeds the number allotted above, the weather days in excess are excusable and non-compensable **provided they have been determined to impact the critical path**.
4. Unused weather allowance days become jointly owned float.
5. Weather day: A day during which the Contractor cannot perform work due to weather events on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment.
6. Weather Event shall mean rain, windstorm, flood, or other natural phenomenon occurring at thesite.
7. If the Contractor considers that a weather event has resulted in an impact to the critical path and/ora Contractual Milestone, then **the Contractor has 2-workdays from the date in question to provide written justification (narrative)** for a weather day request.
   a. The narrative shall describe how the Contractor was not able to perform 50 percent of thecontrolling activities with at least 50 percent of the scheduled labor and equipment. Describe measures taken by the Contractor to mitigate weather

impact on the controlling work.

8. The Contract Time allowed for completion of Work and Liquidated Damages are predicated on the anticipated number of days of inclement weather specified herein.

1.11 WEEKLY LOOK AHEAD SCHEDULE

A. At least two (2) working days in advance of each Weekly Progress Meeting, the Contractor shall provide a time-scaled three (3) week schedule-that reflects the work to be performed in the current week and two (2) additional weeks beyond. In addition, the look ahead schedule shall also record the work started and completed in the previous week, and completed from previous weeks. The look-ahead schedule shall be based on and correlated by activity number in the current Master CPM Schedule Update. Provide the three (3) week look ahead schedule in bar chart format, showing daily activities for that period.

1.12 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. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events.
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Date of Notice of Completion issued and authorized.
21. Description of work started, in progress or completed during that reported shift by the Contractor and for each subcontractor or vendor on site.
22. Location of where the work is being performed by the Contractor and for each subcontractor or vendor on site.
23. When applicable, provide estimated quantities of work being completed.
24. Approximate count of personnel for each subcontractor or vendor on site, including the Contractor's own work crews.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plusitems recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for storedmaterials:
1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the ContractDocuments, 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.

D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise County in advance when these events are known or predictable.
   1. Submit unusual event reports directly to County within one day(s) of an occurrence. Distributecopies of report to parties affected by the occurrence.

1.13 TIME IMPACT ANALYSIS (TIA)

A. Submit a Time Impact Analysis (TIA) with each request for adjustment of Contract Time when the Contractor or the Architect considers that an authorized or anticipated change or event may impact the critical path or work progress.
   1. The Contractor shall submit a Time Impact Analysis within ten (10) calendar days of when the delay was encountered.

B. The TIA shall:
   1. Illustrate the impacts of each change or delay event on the current scheduled completion date orinternal milestone, as appropriate.
   2. Use the accepted CPM schedule that has a data date closest to and before the event.
   3. If the Architect determines that the accepted CPM schedule used does not appropriately represent the conditions before the event, then the accepted schedule shall be updated to the day before the event being analyzed.
   4. Include an impact schedule developed from incorporating the event into the accepted schedule byadding or deleting activities or by changing durations or logic of existing activities.

C. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted schedule, the difference between scheduled completion dates of the two (2) schedules shall be equal to the adjustment of Contract time.

D. Multiple issues shall not be combined into a single Time Impact Analysis submittal. TIAs that incorporate combined issues will be returned to the Contractor for revisions and resubmittal.

E. Time extensions will be granted only when all the available total float on critical path activities driving thesubstantial completion milestone has been exhausted.

F. Events, actions, and progress that cause delays or gains to the Progress Schedule will be analyzed solelyby the "Contemporaneous Period Analysis" method. This methodology is a retrospective analysis that uses the project schedule updates to quantify the slippage to a logic path that was critical or became critical during a select period of time.

G. The Architect may construct and use an appropriate project schedule or other recognized method to determine adjustments in Contract time.

H. If the Architect determines that an impact may occur, the Architect may issue a request for TIA. Upon receiving said request, the Contractor shall submit two copies of the TIA narrative submittal within 10 days of receiving a request for a TIA. Allow 15 working days for review of the submitted TIA. Authorized TIA schedule changes shall be shown on the next updated schedule.
   1. The narrative shall include, but not limited to:
      a. The number of days requested for time extension
      b. A detailed description on the cause of the delay and the effect on the progress of work
      c. Any backup documentation such as RFIs, CCDs, Field Orders, Daily Field Reports,d. Working electronic schedule file in the appropriate schedule software format
      e. List of activity addition or deletions, and/or changes to schedule logic, and durations used inthe development of the impacted schedule.

I. If a submitted TIA is rejected, the Contractor shall meet with the Architect to discuss and

resolve issues related to the TIA. If agreement is reached at a later date, the authorized TIA schedule changes shall be shown on the next updated schedule.

J. In the event the Contractor does not agree with the decision of the Architect regarding the impact of achange or delay, it shall be resolved in accordance with the General Conditions.

1.14 TIME EXTENSIONS

A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of theContractor, impact the critical path of the current Master CPM Schedule.

B. Contractor shall not be granted an extension of time for failure to obtain necessary approvals for deferral approvals due to failure to comply with laws, building codes, and other regulations (including Title 24 of theCalifornia Code of Regulations). No time extensions will be granted under this Contract for the cumulative effect of changes in the Work.

C. District will not be obligated to consider any time extension request unless the schedule requirements stated in the Contract Documents have been met.

D. Failure of the Contractor to perform in accordance with the current Master CPM Schedule Update shall notbe excused because of submittal of a time extension request.

E. Where an event for which County is responsible impacts the projected Contract Substantial Completion date of the Work, or any phase of the Work, the Contractor shall provide a written mitigation plan, includinga schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate County caused time impact. The Contractor shall submit its mitigation plan to County within 7 calendar days from the date of discovery of said impact. The Contractor is responsible for the cost to prepare the mitigation plan.

F. Contractor's failure to a request time extension, provide a TIA, or provide the required mitigation plan will result in Contractor waiving its right to both a time extension and to recovering any costs to mitigate the delay.

1.15 SUBMITTAL OF AS-BUILT SCHEDULE

A. As condition precedent to any release of retention, the last update to the Master CPM Schedule shall be submitted and identified by the Contractor as the "As-Built Schedule". The As-Built Schedule shall reflect the exact manner in which the project was actually constructed (including start and completion dates, activities, sequences, and logic). The As-Built Schedule submitted shall be signed and certified by the Contractor's Project Manager and Construction Scheduler as being a true reflection of the way in which the project was actually constructed. To be submitted along with the Contractor's submission of Closeout Documents.

END OF SECTION 01 32 00

SECTION 01 40 00 QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. 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.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

1.3 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. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

E. 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).

F. 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.

1.4 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.

1.5 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 548; 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 Technical 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. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.6 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 re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

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. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. 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.
3. Notify testing agencies at least 72 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. 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 factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections.

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Re-inspecting: 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.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect, Owner, 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.

G. 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.

H. 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.

1.7 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Retesting and re-inspecting corrected work.

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 modifications as they occur. Provide access to test and inspection log for Architect'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.

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 01 40 00

01 41 00 CONTINUOUS ENVELOPE AIR BARRIER

PART 1 GENERAL

1 .01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 General Requirements, apply to this Section.

1.02 SECTION INCLUDES

A. Administrative and procedural requirements to create an airtight building enclosure that controls infiltration / exfiltration of air.
   1. The Prime Contractor shall ensure that the continuous air barrier around the building enclosure is achieved with the following characteristics:
      a. It must be continuous, with all joints, penetrations, and air paths sealed.
      b. It must be structurally supported.
      c. It must be connected and continuous between foundation & walls, walls & windows/doors, different wall systems, wall & roof.

1.03 RESPONSIBILITIES

A. Prime Contractor Responsibilities: Unless otherwise indicated, the Prime Contractor shall provide coordination of the trades, and the sequence of construction to ensure continuity of the air barrier system joints, junctures and transitions between materials and assemblies of materials and products, from substructure to walls to roof.

PART 2 – PRODUCTS – [not used]

PART 3 – EXECUTION – [not used]

END OF SECTION 00 41 00

SECTION 01 49 00 - PROJECT PROCEDURES FOR INDOOR AIR QUALITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 INDOOR AIR QUALITY

A. Sequence of Finish Installation: Project schedule shall address construction scheduling/sequencing requirements and procedures necessary to optimize Indoor Air Quality (IAQ) levels for the completed Project.

1. Scheduling: Contractor's Project Schedule for finish applications should allow for:

a. Dissipation of high emissions from finishes that off-gas perceptable quantities of deleterious material during curing

b. Separation of off-gasing effects from the installation of adsorptive materials that would act as a "sink" for storage and subsequent release of these unwanted substances into building spaces and mechanical systems after project occupancy.

2. When Contractor's "Project Schedule" requires less than optimal sequencing of finish installation, related to IAQ, provide supplemental "fresh air" ventilation of work areas during construction and restrict / control the use of permanent building mechanical systems prior to Owner acceptance of building to prevent contamination of systems by construction wastes and other deleterious substances.

a. Comply with additional restrictions on the use of permanent building mechanical systems prior to Owner acceptance which may be specified in Division 15 Sections.

B. Temporary Ventilation During Construction: Contractor shall follow procedures specified in this Section and in Division 15 Sections.

C. Air-Out Procedure: Perform an air-out procedure to off gas unwanted chemicals caused by construction and the installation of new products.

D. Materials Emissions / Manufacturer's Testing:

1. Materials specified by the Architect have been evaluated for IAQ impact. Contractor proposed substitutions shall provide necessary manufacturer's information to allow evaluation of product emissions and the impact on IAQ.

2. Emissions data for substitutions are required in order to determine that their installation and use will not cause specified indoor air pollutant limits to be exceeded. Indoor air pollutant limits are specified in the table "Maximum Indoor Air Concentration Standards" in Part 3 of this Section.

3. Where manufacturer's published data is not available or is insufficient to evaluate a material or product, substitution may be rejected, at Architect's or Owner's discretion.

1.3 SUBMITTALS:

A. Substitutions: Provide the following data only for Contractor proposed substitution of materials not specified or listed in Product Schedule (Art.3.01).

1. Product Emissions Test Reports: Submit a report for each material emissions test performed. Include in test report all data specified below. Use “Indoor Air Quality Compliance Table” (Art.3.02).

2. Material Safety Data Sheets (MSDSs): Submit manufacturer's Material Safety Data Sheets for each material employed in respective test sample.

B. Qualification Data for firms performing duct cleaning and testing agencies performing IAQ emissions tests.

C. Work Plan for temporary ventilation, baseline IAQ testing, duct cleaning methods,

1.4 SEQUENCE OF FINISHES APPLICATION

A. Finish Types:

1. Type 1 Finishes: Materials and finishes which have a potential for short-term levels of offgassing from chemicals inherent in their manufacturing process, or which are applied in a form requiring vehicles or carriers for spreading which release a highlevel of particulate matter in the process of installation and/or curing. Type 1 Finishes include, but are not limited to the following:

a. Composite wood products, specifically including particleboard from which millwork, wood paneling, doors or furniture may be fabricated.

b. Adhesives, sealants, and glazing compounds, specifically those with petrochemical vehicles or carriers.

c. Wood preservatives, finishes, and paint.

d. Control and/or expansion joint fillers.

e. All hard finishes requiring adhesive installation.

f. Gypsum board and associated finish processes.

2. Type 2 Finishes: "Fuzzy" materials and finishes which are woven, fibrous, or porous in nature and tend to adsorb chemicals offgassed by Type 1 finishes or may be adversely affected by particulates. These materials become "sinks" for deleterious substances which may be released much later, or collectors of contaminants that may promote subsequent bacterial growth. Type 2 Finishes include, but are not limited to the following:

a. Carpet and padding.

b. Fabric wallcovering.

c. Insulation exposed to the airstream.

d. Acoustic ceiling materials.

e. Fabric covered acoustic wall panels.

f. Upholstered furnishings.

3. Materials that can be categorized as both Type 1 and Type 2 materials shall be considered to be Type 1 materials.

B. Optimal Order of Installation: Apply all Type 1 interior finishes throughout the entire controlled air zone of each enclosed building or building segment and allow such finishes to completely cure according to intervals and times stated in respective finish manufacturer's printed instructions before commencing installation of any Type 2 materials in the same area.

1. Do not store any Type 2 materials in areas where installation or curing of Type 1 materials is in progress.

1.5 TEMPORARY VENTILATION DURING CONSTRUCTION

A. As interior spaces are enclosed and the fan systems are at a point they can be put on line, the Contractor will be allowed to run the systems for temporary ventilation.

1. HVAC units can be run in the 100% outdoor mode and provide 6 AC/hr. ventilation during weather with temperatures 55 deg F and above.

2. During weather with temperatures below 55 deg F, the outdoor air dampers shall be set to a minimum position at 1.5 AC/hr and maintained.

3. Relief shall be accomplished using installed fans.

4. If the building envelope is tight, a temperature range of 55 to 85 deg F shall be maintained with a relative humidity between 30 and 60%.

B. Once the process of temporary ventilation is completed, perform the following:

1. Change all filters periodically during construction (once a month at a minimum).

2. Thoroughly clean the inside of air handling units.

3. Clean all supply ductwork.

1.6 BASELINE IAQ TESTING

A. Upon completion of the work, during final acceptance procedures, Contractor shall take air samples as specified below.

1. During this period, the building shall be ventilated and exhausted (flushed) utilizing the existing air handling systems.

2. With all mechanical plant equipment in operation, building flushing can take place.

3. Interior space shall be ventilated at the rate of 6 AC/hr as long as the outdoor air temperature is at 55 deg F or above. If the temperature is below 55 deg F, use a minimum outdoor air setting giving an air change rate of 1.5 AC/hr

B. HVAC System Verification: To assure compliance with recognized standards for indoor air quality including ASHRAE Standard 62-1989, the HVAC Contractor's independent testing and balancing agency agency shall verify the performance of each HVAC system including space temperature and space humidity uniformity, outside air quantity, filter installation, drain pan operation, and any obvious contamination sources.

C. Indoor Air Quality Testing: Upon verification of HVAC system operation, the Owner will hire an indendent testing laboratory, subject to approval by the Owner's Representative, with a minimum of 5 years experience in performing the types of testing specified herein, to test levels of indoor air contaminents for compliance with specified requirements.

1. Contaminent levels are to be measured in return air ducts at a location prior to mixing with outside air at each air handling unit serving office and administrative areas.

a. Verify areas to be tested with the Owner's Representative. Areas with very high outside air ventilation rates such as laboratories are excluded from these testing requirements. The Owner's Representative is the sole judge of areas exempt from testing.

2. Collect air samples on three consecutive days during normal business hours (between the hours of 8:00 am and 5:00 pm) with building operating at normal HVAC rates. Average the results of each three-day test cycle to determine compliance or non-compliance of indoor air quality for each air handling zone tested.

3. Sample and record outside air levels of formaldehyde and TVOC contaminents at outside air intake of each respective air handling unit simultaneously with indoor tests to establish basis of comparison for these contaminent levels.

4. Acceptance of respective portions of buildings by the Owner is subject to compliance with specified limits of indoor air quality contaminent levels.

5. Where tests result in unacceptable IAQ, arrange a meeting with the Owner's Representative to discuss corrective measures. Subject to written approval of the Owner's Representative, perform corrective measures and retest at no additional expense to the Owner.

D. Compliance: Indoor air quality shall conform to the following standards and limits:

1. Carbon Monoxide: Not to exceed 9 ppm.

2. Carbon Dioxide: Not to exceed 800 ppm.

3. CO_2, Chlordane, Ozone, and Radon: Per ASHRAE 62-1989.

4. Maximum Air Concentration Standards: Indoor room air concentration levels, emission rates, and quantities of the listed contaminents shall not exceed the following limits specified in Table 01490-1, "MAXIMUM INDOOR AIR CONCENTRATION STANDARDS".

E. When the air sampling passes the flushing process can be stopped and normal systems operation put in place if acceptable to the Owner.

1.7 MATERIALS TEST DATA REQUIRED FOR SUBSTITUTIONS

A. All manufacturers/producers of materials listed below that are proposed for substitution on this Project are required to provide test data for their materials which show permanent, in-place Indoor Air Quality performance in accordance with requirements of this Specification.

B. Material Safety Data Sheets: Review all MSDS's of materials to be submitted for testing as well as MSDS's for other products where specifically requested in this Project Manual and identify those classified as "Prohibited Materials".

C. Prohibited Materials:

1. Any building materials or products that emit pollutants included on the International Agency for Research on Cancer (IARD) "List of Chemical Carcinogens", the "Carcinogen List" of the National Toxicology Program, or the "Reproductive Toxin List" of the "Catalog of Teratogenic Agents" must have approval in writing from the Owner's Representative before that building material or product may be used on this Project.

2. Carcinogens: Use of materials emitting carcinogens will not be permitted unless a suitable substitute is not available. Do not proceed with procurement of any carcinogen emitting product or material without prior review and written approval of the Owner's Representative.

D. Materials Testing:

1. Test all materials listed herein intended for use on this Project for emissions of contaminants listed below in Table 01490-1, "MAXIMUM INDOOR AIR CONCENTRATION STANDARDS". Determine, record, and report a projected emission concentration level for each contaminant for each material based upon the installation of that material in a model standard room enclosure 10-feet x 10-feet x 9-feet high, assuming a reasonable proportion of that material installed in the model space as identified in this Specification.

2. Emissions Testing: Perform all testing in accordance with ASTM D 5116, "Standard Guide for Small Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products" (1990). Report results in accordance with Section 11 of the referenced ASTM Guide.

   a. Indicate materials or products that emit pollutants included on the International Agency for Research on Cancer (IARC) "List of Chemical Carcinogens", the "Carcinogen List" of the National Toxicology Program, or the "Reproductive Toxin List" of the *Catalog of Teratogenic Agents*.

3. Maximum Air Concentration Standards: Indoor room air concentration levels, emission rates, and quantities of the listed contaminants shall not exceed the following limits specified in Table 3.1 below.

Table 01490-1 MAXIMUM INDOOR AIR CONCENTRATION STANDARDS

Indoor Contaminants	Allowable Air Concentration Levels
Formaldehyde	<20 ug/m^3
Total Volatile Organic Compounds (TVOC)	<200 ug/m^3
4 Phenyl Cyclohexene (4-PC)*	<3 ug/m^3
Total Particulates (PM_{10})	<20 ug/m^3
Regulated Pollutants	<NAAQS

Other Pollutants	<5% of TLV-TWA

* 4-PC is an odorous contaminant constituent in carpets with styrene-butadiene-latex rubber (SBR).

NAAQS National Ambient Air Quality Standard.

TLV-TWA Threshold Limit Value - Time Waited Average.

PART 2 - PRODUCTS (not applicable)

PART 3 – EXECUTION

3.1 AIR-OUT PROCEDURE

A. Perform an air-out procedure of the building prior to Government occupancy. This procedure is required in order to off gas unwanted chemicals caused by construction and the installation of new products. To perform the air-out, ventilate the building at 100% outside air flow, at maximum velocity for a period of at least 14 days. The last five days of which must take place after acceptance of the space and installation of any new furniture. The air-out will consist of the following two phases:

   1. Phase 1 - Install all new HVAC filters. Open the outside air intakes to maximize the input of outside air into the Government's lease space.

   2. Phase 2 - After the air-out period is complete, install all new HVAC filters. HVAC and airflow settings shall be returned to their standard settings.

B. Prior to final acceptance, the air-out of all construction, printing, cleanup and installation of products must, be completed. The Owner’s Representative will periodically inspect the building before, during and after the air-out.

END OF SECTION 01 49 00

SECTION 01 50 00 TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 TEMPORARY UTILITIES - GENERAL

A. General: Installation and removal of temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.

B. Water Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use 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.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

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 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use room in Field Office: Of sufficient size to accommodate needs of Owner, Architect**,** Construction Manager and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Conference room of sufficient size to accommodate meetings of 5 - 10 individuals. Furnish room with conference table, chairs.
   2. Drinking water and toilet.
   3. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
   4. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

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.

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: Connect to existing service.

B. 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.

C. 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.

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 of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.

B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas as directed by the Owner.

C.

D. 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.

E. Parking: Provide temporary parking areas for construction personnel.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

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. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. 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 as indicated on Drawings.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.

E. 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.

F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

3.5 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.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

END OF SECTION 01 50 00

SECTION 01 60 00 PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named 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 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. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.4 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 ensure 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.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.5 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. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements:

1. Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
2. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
3. 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.
4. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

5. Where products are accompanied by the term "as selected," Architect will make selection.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: For products specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
8. Provide products that at a minimum are compliant with Finish Material Pollutant Control requirements as outlined in Section 5.504.4 of the 2013 California Green Building Standards Code including: adhesives, sealants, caulks, paints, coatings, carpet systems, composite wood products and resilient flooring systems. **(CALGreen)**
    a. Maintain product information on-site during construction for examination by the enforcing agency.

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.
    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. Products of the same category shall be products of a single manufacturer. Where possible, products under a single specification section shall be of the same manufacturer.

D. Where all other criteria are met, Contractor shall give preference to products that:
1. Are extracted, harvested, and/or manufactured closer to the location of the project.
2. Have longer documented life span under normal use.
3. Result in less construction waste.
4. Are made of materials that are rapidly renewable.
5. Have higher recycled content.

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 01 60 00

SECTION 01 71 23 -SURVEYING

A. Summary: OWNER shall provide at the begiining of the project, survey control for establishing reference points and data furnished on the Construction Drawings.
   1. Job Conditions
      a. Accuracy of Data: Site data given herein and on the Construction Drawings are as exact as could be secured, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, etc., shall finally be governed by field conditions and the ARCHITECT'S instructions.
      b. Conflicts with Existing Conditions: In the event there is any conflict between actual conditions and the Construction Drawings, notify the ARCHITECT immediately and do not proceed with the work until directed by the ARCHITECT.

B. Minimum Staking: The following survey control shall be provided by the CONTRACTOR for use in staking for constructing the improvements as shown on the contract documents.
   1. Rough Grade Staking for parking areas, building areas, and biotreatment areas.
   2. Finish Grade Staking for parking area curbs, gutters, driveway, slabs and sidewalk areas as shown on the project plans.
   3. Finish Grade staking for building foundation(s)
   4. Underground Utilities
      a. Storm Drain – Provide one set of 2 stakes per storm drainage structure greater than 8" in diameter and 1 stake every 100' for line and grade between these structures.
      b. Sanitary Sewer System – Provide one set of 2 stakes per manhole and 1 stake every 100' for line and grade.
      c. Fire Service – Provide one stake at all fire main angle points and tees for horizontal location only and fire hydrant locations.
      d. Water Service – Provide one stake at all water main angle points and tees for horizontal location only.
      e. Light standards – horizontal location only.

C. Protection of Existing Features
   a. Preservation of Markers: All stakes, boundary lines, corner markers, bench marks or survey markers, etc., which have been or may be established in any part of the site, shall be carefully preserved and respected by the CONTRACTOR and shall be restored at the CONTRACTOR's expense if lost or destroyed as a result of the CONTRACTOR's operations.

END OF SECTION 01 71 23

SECTION 01 73 00 EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Code Compliance
2. Construction layout.
3. Field engineering and surveying.
4. Installation of the Work.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

A. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.5 CODE COMPLIANCE

A. Contractors shall secure and pay fees for all applicable permits, inspections, approvals and certificates required by local and state laws. Conform to all ordinances, rules, regulations and codes applicable to the location of the Project.

B. In addition to the above, conform to the following codes, regulations and standards:

1. As indicated on the Drawings cover sheet.
2. Other specific standards and regulations as specified in the individual sections specified throughout the Project Manual.

C. Comply with all applicable requirements and codes adopted by the local Fire Department, Health Department and Utility Companies having jurisdiction. Comply with any additional requirements of any local, state or federal requirements which may be applicable, particularly local ordinances regarding dust control, erosion control, noise abatement, traffic control, street access or temporary closure and

blockage, or permissible hours of operation.

D. In case of conflict between referenced applicable codes, or other requirements, the most stringent requirement shall govern. Where governing codes and regulations indicate that the drawings or specifications do not comply with the minimum requirements of the codes or regulations, the Contractor shall be responsible for providing an installation complying with the codes requirements. Drawings and specifications shall be followed where they are superior to code requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. 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, mechanical and electrical systems 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. 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, Architect and Owner 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.

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: Engage a land 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 layout site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. 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. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. 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.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. 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.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its

original condition.

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. Protect stored on-site or installed absorptive materials from moisture damage. Sources of moisture contamination include precipitation, air intakes, cleaning procedures, flushing procedures, testing procedures, leaks, etc.

E. 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.

F. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

G. Volatile organic compound source control: Containers of wet products are to be kept closed when not in use.

H. 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.

I. 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.

J. 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.

K. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Pre-installation Conferences: Include Owner's construction personnel at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

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 materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Use containers intended for holding waste materials of type to be stored.

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. Suppress dust with wetting agents or sweeping compounds. Use an efficient and effective dust collecting method such as a damp cloth, wet mop, or vacuum with particulate filters. Activities which produce high dust levels shall be cleaned up immediately upon completion or at the end each day the activity continues.

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. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls" and Section 017419 "Construction Waste Management and Disposal."

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 operating components 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.

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.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION
01 73 00

SECTION 01 73 29 CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety. Operating elements include the following:

1. Primary operational systems and equipment.
2. Control systems.
3. Communication systems.
4. Electrical wiring systems.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

1.4 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials 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 match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. 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.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. 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 prevent interruption to occupied areas.

3.3 PERFORMANCE

A. 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. 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 as small as possible, neatly to 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: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. 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.
5. Proceed with patching after construction operations requiring cutting are complete.

C. 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 possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate 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 eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

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.
    a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

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.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

E. Construction Waste Disposal: Comply with Section 01 74 19 "Construction Waste Management and Disposal."

END OF SECTION 01 73 29

SECTION 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition and/or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE REQUIREMENTS

- General: Develop waste management plan that results in a minimum of **65%** recycling rate for salvage/recycling of total non-hazardous solid waste generated by the Work, calculated as a percent by weight or volume of total waste generated by the Work. Use one unit of measurement consistently. Excavated soil and land-clearing debris shall be repurposed and calculated separately. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled.

A. Regulatory: Meet all requirements of the local jurisdiction.

1.4 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 14 days of date established for commencement of the Work the Notice to Proceed

1.5 INFORMATIONAL SUBMITTALS.

A. Waste Reduction Progress Reports/Calculations: Submit report to Owner and Architect, concurrent with each Application for Payment. Include the following information:

1. Material category.
2. Total quantity of waste.
3. Quantity of waste salvaged.
4. Quantity of waste recycled.
5. Total quantity of waste recovered (salvaged plus recycled).
6. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
7. Current project diversion rate (from start of demolition to current time period).
   a. If the facility's average recycling rate is being used, provide current diversion rates from the sorting facility.

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. Qualification Data: For refrigerant recovery technician.

D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.6 QUALITY ASSURANCE

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

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Coordinator: Identify 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.

D. Waste Management Conference: Conduct conference at Project site to comply with requirements of the County's Construction & Demolition Recycling Guide. Review methods and procedures related to waste management including, but not limited to, the following:
1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for transporting waste to specified collection area(s).
5. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
6. Review waste management requirements for each trade.
7. Review any special circumstances.

E. Record Keeping: Contractor shall maintain records of the disposition of all waste.
1. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
2. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
3. 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.
4. 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.

1.7 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN

A. General: Develop a Construction and Demolition Waste Management Plan.

1. Plan must comply with the requirements outlined in Section 5.408.1 of the 2016 California Green Building Standards Code**. (CALGreen)**

2. Plan may include on-site sorting, off-site sorting, or a mixture of the two.
   a. Off-site sorting must adhere to one of the following requirements:
      1) Off-site sorting facility must provide project-specific diversion rates of comingled debris, or
      2) Off-site sorting facility must be regulated by a local or state government authority regarding the facility's method of recording and calculating the recycling rate.
         a) If this path is used, the average annual recycling rate for the specific sorting facility is to be used for the calculations.

3. The Plan must identify the following:
   a. Contractor's designated Waste Management Coordinator
      1) Include name, address and telephone number.
   b. Hauler(s).
      1) Include names, addresses, and telephone numbers.
      2) Identify if registered with a state or local government authority.
   c. Construction and demolition waste recycling and processing facilities.
      1) Include names, addresses, and telephone numbers.
      2) Identify if registered with and/or regulated by a state or local government authority.
   d. Diversion goals.
   e. Waste Reduction Work Plan:
      1) List each type of waste and whether it will be salvaged, separated on-site, sent to a construction and demolition waste facility to be separated off-site, disposed of in a landfill or incinerator, or requires special handling.
         a) 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. For materials that will be salvaged and reused in another facility, identify level of disassembly required, the location to which the materials are to be delivered, and the names, addresses and telephone numbers of the receivers.
         b) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
         c) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
         d) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
         e) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
         f) Food Beverage and Office Waste: For materials brought onto the project site that are not intended for incorporation into the project, describe methods for sorting this material so as not to contaminate construction waste.
      2) 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..
   f. Waste tracking requirements.
      1) The amount of construction waste materials diverted shall be calculated by weight or volume, but not both.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved Construction and Demolition 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.

1. Plan shall be updated as necessary, and shall be accessible during construction for examination by the enforcing agency. **(CALGREEN)**

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return, and review with each trade as they begin work on the site.

C. 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 collection and/or separation of materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
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.

3.3 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.

END OF SECTION 01 74 19

SECTION 01 77 00 CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections and General Conditions, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Submit current construction waste management calculations.
5. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Perform preventive maintenance on equipment used prior to Substantial Completion.
3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
5. Complete final cleaning requirements, including touchup painting.
6. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor

of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected punch list, endorsed and dated by the Contractor. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS: PUNCH LIST

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.

e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

g. Sweep concrete floors broom clean in unoccupied spaces..

h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.

i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

j. Remove labels that are not permanent.

k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

o. Leave Project clean and ready for occupancy.

C. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls" and Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

   a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

SECTION 01 78 23 -OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This 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. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

B. Related Sections include the following:
1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
3. Division 01 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
4. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 SUBMITTALS

A. Initial Submittal: Submit three draft copies of each manual at least 15 business days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.

B. Final Submittal: Submit three copies of each manual in final form at least 15 business days before final inspection. Architect will return copy with comments within 15 business days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit three copies of each corrected manual within 15 business days of receipt of Architect's comments.

1.5 COORDINATION

A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. 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.

B. Title Page: Enclose title page in transparent plastic sleeve. 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, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. 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.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. 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.

1. Binders: Heavy-duty, 3-ring, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. 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 tabs for each section. 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 diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. 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.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.

6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Special operating instructions and procedures.

2.4 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.
2. Operating standards.
3. Operating procedures.
4. Wiring diagrams.
5. Control diagrams.
6. Piped system diagrams.
7. Precautions against improper use.
8. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number.
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. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Equipment or system break-in procedures.
2. Routine and normal operating instructions.
3. Regulation and control procedures.
4. Instructions on stopping.
5. Normal shutdown instructions.
6. Seasonal and weekend operating instructions.
7. Required sequences for electric or electronic systems.
8. 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.

F. PRODUCT MAINTENANCE MANUAL

G. 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.

H. 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.

I. 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.

J. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Types of cleaning agents to be used and methods of cleaning.
2. List of cleaning agents and methods of cleaning detrimental to product.
3. Schedule for routine cleaning and maintenance.

K. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

L. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

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 printed 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. Aligning, adjusting, and checking instructions.
5. Demonstration and training videotape, 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.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

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. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. 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.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. 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.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. 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.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. 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.
2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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.
4. Miscellaneous record submittals.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit **one** set of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:
   a. Initial Submittal:
      1) Submit record digital data files and one set(s) of plots.
      2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
   b. Final Submittal:
      1) Submit record digital data files and three set(s) of record digital data file plots.
      2) Plot each drawing file, whether or not changes and additional information were recorded.

B. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit] one paper copy and 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 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. Accurately record information in an acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Changes made by Change Order or Construction Change Directive.
    g. Changes made following Architect's written orders.
    h. Details not on the original Contract Drawings.
    i. Field records for variable and concealed conditions.
    j. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
4. Refer instances of uncertainty to Architect through the Owner for resolution.

C. 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. Format: Annotated PDF electronic file with comment function enabled.
3. 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.
4. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.

e. Name of Contractor.

2.2 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 and one paper copy of marked up miscellaneous record submittals.

1. Include miscellaneous record submittals directory organized by specification section number and title, electronically linked to each item of miscellaneous record submittals.

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 and Owner's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00 DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.

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 live instructional modules.

1.3 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative experienced in operation and maintenance procedures and training.

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 instructors, including providing notification of dates, times, length of instruction time, and course content.

C. 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 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. 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.

4. Adjustments: Include the following
a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

5. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

6. 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.

7. 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.

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

B. 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, through Owner’s representative with at least seven days' advance notice.

C. 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.

D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 01 79 00

SECTION 01 91 00 - GENERAL COMMISSIONING

PART 1 – GENERAL

1.1 RELATED SECTIONS

A. 22 08 00 Commissioning of Plumbing Systems

B. 23 08 00 Commissioning of HVAC Systems

C. 26 08 00 Commissioning of Electrical Systems

1.2 DESCRIPTION OF WORK

A. Commissioning is a systematic process of ensuring that all building systems perform interactively according to the design intent and the owner's operational needs. This is achieved by beginning in the design phase and documenting design intent and continuing through construction, acceptance with actual verification of performance. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training.

B. The Commissioning Authority (CA) will be directly hired by the Owner. The General Contractor that is awarded the project shall not include the cost of the Commissioning Authority in their price. The general contractor (and their sub-contractors) shall include cost for their involvement in the commissioning process as described in this section and other related commissioning sections, including completion of system readiness checklists, and demonstration of installed equipment to the commissioning team members during the functional performance testing portion of the project.

C. Commissioning during the construction phase is intended to enhance the quality of system start-up and aid in the orderly completion and transfer of systems for beneficial use by the owner. The following objectives will be documented accordingly:

1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted standards, that they meet design intent, and that they receive adequate operational checkout by installing contractors.
2. Verify and document proper performance of equipment and systems.
3. Verify that O&M documentation left on site is complete.
4. Verify that the Owner's operating personnel are adequately trained.

D. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished product, installed and fully functional in accordance with the contract documents.

1.3 ABBREVIATIONS

A. The following are common abbreviations used in the Specifications and in the Commissioning Plan.

A/E-	Architect and design Engineers	GC-	General Contractor (prime)

CA-	Commissioning Authority (Agent)	MC-	Mechanical Contractor
CC	Controls Contractor	PC -	Plumbing Contractor
CM-	Construction Manager (the owner's representative)	PM-	Project Manager (of the Owner)
Cx-	Commissioning	SRC	System Readiness Checklist
Cx Plan-	Commissioning Plan document	Subs-	Subcontractors to General
EC-	Electrical Contractor	TAB-	Testing Adjusting and Balance Contractor
FT-	Functional Performance Test	TC-	Test Coordinator

1.4 DEFINITIONS

A. Basis Of Design (BOD): The basis of design is the documentation of the primary thought processes and assumptions behind design decisions that were made to meet the design intent. The basis of design describes the systems, components, conditions, and methods chosen to meet the intent. Some reiterating of the design intent may be included.

B. Commissioning Plan: An overall plan that provides the structure, schedule and coordination planning for the commissioning process.

C. Deferred Functional Tests: FTs that are performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions that disallow the test from being performed.

D. Deficiency: A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents (that is, does not perform properly or is not complying with the design intent).

E. Design Narrative: Sections of either the Design Intent or Basis Of Design which describe the systems operation and principle function

F. Functional Performance Test (FT): Test of the dynamic function and operation of equipment and systems using direct observation or monitoring methods. Functional testing is the dynamic testing in all modes of systems (rather than just components) under full operation (e.g. the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure set point). The systems are run through all the control system's sequences of operation and components are verified to be responding as the sequences state. Traditional air or water test and balancing (TAB) is not functional testing, in the commissioning sense of the word. The commissioning authority develops the functional test procedures in a sequential written form, coordinates, oversees and documents the actual testing, which is usually performed by the installing contractor or vendor. Functional performance tests shall demonstrate the correct installation and operation of each component, system, and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

G. Over-written Value: Writing over a sensor value in the control system to see the response of a system (e.g., changing the outside air temperature value from 50F to 75F to verify economizer operation).

H. Owner Project Requirements (OPR): The expectation and requirements of the building shall be documented before the design phase of the project begins.

I. Sampling: Functionally testing only a fraction of the total number of identical or near identical pieces of equipment.

J. Seasonal Performance Tests: FT that are deferred until the system(s) will experience conditions closer to their design conditions.

K. Simulated Condition: Condition that is created for the purpose of testing the response of a system (e.g., applying a hair blower to a space sensor to see the response in a VAV box).

L. Simulated Signal: Disconnecting a sensor and using a signal generator to send an amperage, resistance or pressure to the transducer and DDC system to simulate a sensor value.

M. Systems Manual: Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative/operator

N. System Readiness Checklist (SRC): A checklist developed by the CA and provided to the contractor for execution. Completion of this checklist verifies the system or component has been installed in accordance with design documents and IOMs. This checklist is required before commencing functional testing. The signee for a specific contractor section in a SRC will be the same throughout the project (e.g. only one person will sign for the MC).

O. Testing Coordinator (TC): Commissioning Team member appointed by GC. TC's roles include distribution of SRCs between Subs & CA, ensure execution & completion of SRCs by Subs, collect/review completeness of SRCs for final delivery to CA, coordinate scheduling of functional tests, collect all required documents (eg O&Ms, training plans, etc) and deliver to the CA. The TC must be familiar with all of the commissioned equipment and possess good organizational skills.

1.5 COMMISSIONING PROCESS

A. The following activities describe the commissioning tasks during construction and the general order in which they occur. The CA coordinates all activities.

B. Scoping Meeting: All members of the design and construction team that will be involved in the commissioning process meet and agree on the scope of work, tasks, schedules, deliverables, and responsibilities for implementation of the Commissioning Plan.

C. Commissioning Plan: The Commissioning Plan provides guidance in the execution of the commissioning process. The Specifications take precedence over the Commissioning Plan.

D. Submittals: Equipment documentation is submitted within 30 days of approval to the CA, including detailed start-up procedures.

E. Start-Up/System Readiness Checklists (SRC): The CA works with the Subcontractors to develop startup plans and documentation formats, including providing the Subcontractors with system readiness checklists to be completed during the startup process.

F. Functional Performance Testing: The CA develops specific equipment and system functional performance test procedures. The Subcontractors review the procedures. The procedures are executed by the Subcontractors, under the direction of, and documented by the CA.

G. Deficiencies and Resolution: The CA documents items of non-compliance in materials, installation or operation. The items are corrected at the Sub's expense and the equipment or systems are retested.

H. Operations and Maintenance Documentation: The CA reviews the Operation and Maintenance documentation for completeness.

I. Training: The CA reviews the training plans and agenda provided by the Subcontractors and verifies that training is completed.

J. Commissioning Report: The CA writes the commissioning report.

1.6 SCOPE OF WORK

A. The following building systems will be included in the commissioning process for the project:

1. Division 22 (Domestic Hot Water System)
2. Division 23 (Heating Ventilation and Air Conditioning)
3. Division 26 (Lighting Controls)
4. Landscape Irrigation System

1.7 COMMISSIONING TEAM

A. The members of the commissioning team consist of the following members:

1. Commissioning Authority (Agent) (CA)
2. Owner's Project Manager (PM)
3. General Contractor (GC or Contractor)
4. Architect and Design Engineers (particularly the mechanical and electrical engineers)
5. Mechanical Contractor (MC)
6. Electrical Contractor (EC)
7. Test and Balance contractor (TAB)
8. Controls Contractor (CC)
9. Plumbing contractor (PC)
10. Landscape Contractor (LC)
11. Any other installing subcontractors or suppliers of equipment
12. Owner's maintenance personnel
13. Inspector of Record

1.8 COMMISSIONING AUTHORITY'S RESPONSIBILITIES

A. General

1. The CA, as leader of the commissioning team, directs and coordinates the commissioning activities in conjunction with the General Contractor. All members work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.
2. Within 30 days prior to equipment startup, the CA will schedule and conduct a commissioning scope meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CA. CA will revise the Commissioning Plan to its “final” version from information gathered at the meeting and will distribute to all parties.
3. The CA will work with the CM & GC according to established protocols to schedule the commissioning activities. The CA will provide sufficient notice to the CM & GC for scheduling commissioning activities. The GC will integrate all commissioning activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner to expedite the commissioning process.
4. The CA will provide the initial schedule of primary commissioning events at the commissioning scope meeting. The Commissioning Plan provides a format for this schedule, as included in the Cx Plan. As construction progresses, more detailed schedules will be developed by the GC.
5. The CA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the general contractor and the A/E. The primary role of the CA is to develop & coordinate the execution of a testing plan, observe & document performance—that systems are functioning in accordance with the documented design intent & in accordance with the contract documents. The Contractors will provide all tools or the use of tools to start, check-out & functionally test equipment and systems.
6. The CA will not release, revoke, alter, or enlarge on requirements of design documents.
7. The CA will not directly approve or accept any portion of construction work.

B. Construction and Acceptance Phase

1. Coordinates and directs the commissioning activities in a logical, sequential & efficient manner using consistent protocols and forms, centralized documentation, clear & regular communications & consultations with all necessary parties, frequently updated timelines & schedules and technical expertise.
2. Coordinate the commissioning work and, with the GC & CM, ensure that commissioning activities are being scheduled into the master schedule.
3. Revise the Commissioning Plan as required.
4. Plan and conduct a commissioning scoping meeting & other commissioning meetings as necessary.
5. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.
6. Before startup, gather & review the current control sequences & interlocks and work with contractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
7. Write and distribute System Readiness Checklists.
8. Perform site visits to observe component & system installations as needed.

9. Approve SRCs and their completion as submitted by TC for CA's review. CA shall perform selected site observation and spot checking as needed.
10. Review TAB execution plan.
11. Approve air and water systems balancing by spot testing, reviewing completed reports and by selected site observation.
12. Create the FT procedures for equipment and systems with input & review by GC/Subs. Submit to CM for review, and for approval if required.
13. Coordinate, witness and approve manual FT performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved.
14. Maintain a master deficiency and resolution log. Provide the CM with written progress reports and test results with recommended actions.
15. Compile and maintain a commissioning issues log.
16. Provide a final commissioning report.
17. Assist in development of training plan and documentation of Owner maintenance staff training.
18. Throughout the commissioning process, document that equipment and systems are installed and perform in accordance with design documents.

1.9 DESIGN TEAM RESPONSIBILITIES

A. Construction and Acceptance Phase

1. Attend the commissioning scope meeting.
2. Attend selected commissioning team meetings.
3. Perform normal submittal review, construction observation, as-built drawing preparation, O&M manual preparation, etc., as contracted.
4. Provide any design narrative documentation requested by the CA.
5. Review construction and issue punch lists as required.
6. Provide design intent and sequence of operation documentation as required by the CA.
7. Assist and Coordinate resolution of system deficiencies identified during commissioning or review, according to the contract documents.
8. Approve TAB report prior to distribution to the CA.
9. Prepare and submit final as-built design intent documentation for inclusion in the O&M manuals.
10. Review and approve the O&M manuals.

1.10 OWNER'S REPRESENTATIVE (PM) RESPONSIBILITIES

A. Construction and Acceptance Phase

1. Manage the contract of the CA
2. Facilitate the coordination of the commissioning work by the CA.
3. Ensure with CA & GC that commissioning activities are being scheduled into the master schedule.
4. Review the final Commissioning Plan.

5. Attend commissioning scope meeting and other commissioning team meetings.
6. Furnish to CA copies of all construction documents, addenda, change orders for commissioned equipment.
7. Review and approve CA generated FT procedures prior to testing.
8. Observe SRC completion & FT's for systems to be commissioned.
9. Review commissioning progress and deficiency reports.
10. Coordinate the resolution of non-compliance and design deficiencies identified in all phases of commissioning.
11. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.
12. Assist the GC in coordinating the training of owner personnel.
13. Provide required IP addresses to controls contractor for setting up remote access to controls systems.

1.11 GENERAL CONTRACTOR (GC) RESPONSIBILITIES

A. Construction and Acceptance Phase

1. Facilitate the coordination of the commissioning work by the CA.
2. Ensure with CA that commissioning activities are being scheduled into the master schedule.
3. Appoint TC for management of SRCs.
4. Include the cost of commissioning in the total contract price. Include all special tool and instruments (only available from vendor, specific to a piece of equipment) required for testing in base bid price.
5. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CA.
6. Provide a copy of O&Ms, startup reports, TAB reports, and any other necessary documents for commissioned equipment to the CA.
7. Provide submittals for systems to be commissioned to the engineer of record and the CA.
8. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
9. Provide equipment sequences of operation and final calibration point to point reports to the CA.
10. Ensure that all Subs execute their commissioning responsibilities according to the contract documents and schedule.
11. Attend commissioning scope meeting and other necessary meetings scheduled by the CA to facilitate the Cx process.
12. Coordinate with subs on construction progress & equipment readiness for SRC completion.
13. Coordinate with CA on construction progress & system readiness for FT completion. Provide the CA ten (10) day advance notice so that system start-up and functional testing can begin.
14. Provide input on functional test scripts.

15. Pre-test all systems and equipment using functional test scripts prior to formal testing in presence of commissioning agent.
16. Coordinate with Subs to assist in and execute functional tests for verification by the CA.
17. Resolve system deficiencies identified during commissioning process.
18. Coordinate with Subs to execute re-testing of deficient systems and equipment.
19. Coordinate the training of owner personnel. Submit an owner training plan to the CA for review and approval.
20. Video record training sessions and provide to owner.
21. Provide trend logs from the controls system to the CA for review.
22. Prepare O&M manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
23. Responsible for certifying that the work is complete and systems are operational according to design documents.
24. Complete CALGreen closeout documentation as required.

1.12 EQUIPMENT SUPPLIERS

A. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.

B. Assist in equipment testing per agreements with Subs.

C. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor, except for stand-alone data logging equipment that may be used by the CA.

D. Provide equipment sequence of operation and testing procedures as requested by CA.

E. Review test procedures for equipment installed (or started up) by factory representatives.

1.13 SYSTEMS TO BE COMMISSIONED

A. The following systems will be commissioned in this project:

1. HVAC System
2. Domestic Hot Water System
3. Internal and External Lighting Controls
4. TAB Verification
5. HVAC Control Systems
6. Landscape Irrigation Systems

1.14 COMMISSIONING DOCUMENTATION

A. Commissioning Plan: Prior to permit issuance, a commissioning plan shall be completed to document how the project will be commissioned. Provided as part of the bid documents, is binding on the Contractor. The commissioning plan provides guidance in the execution of the commissioning process. Just after the initial commissioning scoping meeting the CA will update the plan which is then considered the "final" plan, though it will continue to evolve and expand as the project progresses. The specifications will take precedence over the Commissioning Plan. The commissioning plan shall include the following:

1. General project information
2. Commissioning goals
3. Systems to be commissioned
4. Commissioning team information
5. Commissioning process activities, schedules and responsibilities

B. Commissioning Report: A final summary report by the CA will be provided to Owner. The report will focus on evaluating commissioning process issues. System Readiness Checklists, functional tests and monitoring reports will not be part of the final report. For each piece of commissioned equipment, the report should contain the disposition of the commissioning authority regarding the adequacy of the equipment, documentation and training meeting the contract documents in the following areas:

1. Description of Commissioning Scope
2. System Readiness Checklists and Equipment Start-Up
3. Functional Performance Testing Results
4. Training documentation and evaluation
5. Outstanding Issues
6. Recommendations

1.15 SUBMITTALS

A. The CA employs the submittals and IO&Ms to develop the SRCs and FT's. The CA shall review submittals for conformance with construction documents, OPR, & BOD. Submittals provided to the CA must have been approved by the A/E.

B. The A/E will review & approve commissioned equipment submittals for conformance to the contract documents as it relates to the commissioning process, the functional performance of the equipment, & adequacy for developing test procedures. This review shall verify compliance with equipment specifications. The A/E will notify the CM or PM of items missing or areas that are not in conformance with contract documents and which require resubmission.

C. A/E or GC shall provide a complete & approved submittal package to the CA.

D. The CA may request additional design narratives from the A/E and Controls Contractor, depending on the completeness of the design intent documentation and sequences provided in the specifications.

E. Equipment submittals to the CA do not constitute compliance for O&M manual documentation. The IO&M manuals are furnished separately by the Contractor. CA shall review them for development of the SRCs and FTs. IO&M manuals shall be provided with the approved submittals.

F. Contractor shall provide/submit the following documents to the CA:

1. Revised construction schedule including commissioning tasks.
2. Equipment submittals for all commissioned equipment.
3. Sequences of operation for all commissioned equipment.
4. Control diagrams for all commissioned equipment.
5. Final testing and balancing report.
6. Energy code compliance forms – if applicable.
7. Completed SRCs.
8. Manufacturer IO&Ms for commissioned equipment.
9. Training plan for commissioned systems.
10. As-built control sequences and construction drawings.

PART 2 – PRODUCTS

2.1 TEST EQUIPMENT

A. See Schedules on Drawings for equipment data. Furnish and install all equipment in All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Division contractor for the equipment being tested. E.G. the MC of Division 23 shall ultimately be responsible for all standard testing equipment for the HVAC system and controls system in Division 23, except for equipment specific to and used by TAB in their commissioning responsibilities.

B. Special Tools: Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and left on site. Stand-alone data logging equipment used by the CA shall not be subject to this requirement.

2.2 RECORDING

A. The GC shall digitally record the audio and visual of selected trainings:

1. HVAC and Controls
2. Plumbing
3. Electrical – Lighting Controls

B. An introduction shall be made at the beginning of each recording, identifying what equipment is being illustrated, where it is located and who the trainer is.

C. Recording shall be accomplished with a tripod when possible and performed in an expert manner so that the issues being discussed are clearly illustrated and instructions clearly audible. A high quality camera shall be used and additional light provided if ambient light is insufficient.

D. Media shall be clearly labeled with the equipment, date, trainer and segment duration.

E. The digital visual and audio recording shall be bookmarked at each training with an index/table of contents provided and recorded on the DVD. The bookmarks will clearly indicate which equipment is being presented and the format will allow search and go-to functions for rapidly locating training segments.

F. An original and one copy of the recordings shall be submitted to the OWNER.

PART 3 – EXECUTION

3.1 COMMISSIONING PROCESS

A. The following narrative provides a brief overview of the typical commissioning tasks during design and construction and the general order in which they occur:

1. CA develops draft commissioning plan for review by the design team. After the scope meeting, the CA will update the Cx Plan and provide the final plan to the commissioning team.
2. Equipment documentation is submitted to the CA after submittal approval by the A/E.
3. The CA develops the System Readiness Checklists and provides these to the TC to be completed during the startup process.
4. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels with the SRCs being completed before FT's.
5. SRCs will be developed and issued after receipt of A/E approved submittals and IO&Ms by the CA.
6. Commissioning during construction begins with a scope meeting conducted by the CA where the commissioning process is reviewed with the commissioning team members.
7. TC shall deliver one set of blank SRCs to Subs. TC shall collect all completed SRCs and deliver package to CA.
8. The Subs, under their own direction, execute the system start-ups and their completion on the SRCs. The completed SRCs are returned to the TC to be returned to the CA for review.
9. The CA develops specific equipment and system FT procedures.
10. The FT procedures are executed by the Subs under the direction of the CA and documented by the CA.
11. Items of non-compliance in material, installation or setup are corrected at the Sub's expense (including the CA's time and expenses) and the system is retested. The General Contractor is responsible for collecting cost and expenses for retesting.
12. GC shall bear all costs should the CA receive any incomplete SRCs and the CA is required to complete the SRCs to support the construction schedule.
13. The CA provides functional test forms to the GC for review. Close coordination is especially required between the CA and the CC to ensure successful development of the functional tests.
14. CA witnesses all functional tests executed by the subs under the direction of the CA.
15. Any required re-tests are conducted as determined by the CA. Any associated costs with re-tests, including the CA's time and expenses will be charged back to the GC and may be collected from the subs.

16. Training plans are developed and provided to the Owners representative for review.
17. Often the functional tests include trend data analysis that is often completed after occupancy.
18. Training is conducted by the Subs and verified by the CA.
19. Functional tests and training is finished before Substantial Completion.
20. Final commissioning report is written.

3.2 SYSTEM READINESS CHECKLIST

A. Procedure: The following procedures apply to all equipment to be commissioned as listed in the Commissioning Plan. Mechanical, plumbing, & electrical commissioning specification sections describe subcontractor responsibilities.

B. General: The SRC for a given system must be successfully completed prior to formal functional performance testing of equipment or subsystems of the given system. The SRC is developed as follows:

1. A/E approved submittals are provided to CA by A/E or GC.
2. IO&M manuals provided to CA by GC.
3. CA develops SRCs from IO&Ms and submittal information.

C. Execution of the SRC

1. CA provides SRC to TC.
2. Installing contractor obtains documentation from TC and any specific manufacturer start-up, including checklists from the O&M.
3. TC coordinates execution of the equipment start-up among Subs per construction schedule.
4. Subs complete start-up and complete SRCs.
5. Only individuals that have direct knowledge and witnessed the start-up shall sign and complete the SRC.
6. All completed SRCs are returned to TC to be provided to the CA for review and approval.

D. Deficiencies, Non-Conformance and Approval in Checklists and Startup

1. The Subs shall clearly list any outstanding items of the initial start-up on the SRC.
2. The SRC and any outstanding deficiencies are provided to the CA within one week of test completion.
3. The CA reviews the SRC & shall work with the Subs & vendors to correct and retest deficiencies or uncompleted items at contractor’s expense (including CA’s time). The installing Subs or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner. Subs shall notify the CA as items have been corrected. Start-up report shall be updated as deficiencies are resolved.
4. Items left incomplete, which later cause deficiencies or delays during functional testing may result in additional costs due to either CA interventions or construction delay liquidated damages to the responsible party. Any SRCs that required CA to complete will result in additional charges to the GC that may be collected from installing sub.

3.3 FUNCTIONAL PERFORMANCE TESTING

A. This sub-section applies to all commissioning functional testing for all divisions.

B. Equipment: The general list of equipment to be commissioned is found in the Commissioning Plan.

C. See Mechanical, plumbing, & electrical commissioning specification sections for Subs responsibilities.

D. Objectives and Scope.

1. The objective of FT's is to demonstrate that each system is operating according to the documented design intent and contract documents. FT's facilitate bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.

2. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested.

E. Development of Test Procedures.

1. Before test procedures are written, the CA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, control sequences and parameters. Each Sub or vendor responsible to execute a test, shall provide assistance to the CA in developing the procedures (answering questions about equipment, operation, sequences, etc.). Prior to execution, the CA shall provide a copy of the test procedures to the Sub(s) who shall review the tests for feasibility, safety, equipment and warranty protection. The CA may submit the tests to the A/E for review, if requested.

F. Test Methods.

1. FT's and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand-alone data loggers.

2. Simulated Conditions. Simulating conditions (not by an overwritten value) shall be allowed, though timing the testing to experience actual conditions is encouraged whenever practical.

3. Overwritten Values. Overwriting sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Such testing methods often can only test a part of a system, as the interactions and responses of other systems will be erroneous or not applicable. Simulating a condition is preferable. e.g., for the above case, by heating the outside air sensor with a hair blower rather than overwriting the value or by altering the appropriate setpoint to see the desired response. Before simulating conditions or overwriting values, sensors, transducers and devices shall have been calibrated.

4. Simulated Signals. Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended over using the sensor to act as the signal generator via simulated conditions or overwritten values.

5. Altering Setpoints. Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable. For example, to see the AC compressor lockout work at an outside air temperature below 55F, when the outside air temperature is above 55F, temporarily change the lockout setpoint to be 2F above the current outside air temperature.

6. Indirect Indicators. Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification is completed during completion of the start-up plan.

7. Setup. Each function and test shall be performed under conditions that simulate actual conditions as close as is practically possible. The Sub executing the test shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the Sub shall return all affected building equipment and systems, due to these temporary modifications, to their pre-test condition.

8. Sampling. Multiple identical pieces of non-life-safety or otherwise non-critical equipment may be functionally tested using a sampling strategy. No sampling by Subs is allowed for SRCs or FT's. Should frequent failures during testing require more troubleshooting than verification, the CA shall stop the testing and require the responsible Sub to perform and document a checkout of the remaining units.

G. Coordination and Scheduling

1. The Subs through the TC shall provide sufficient notice to the CA of their completion schedule for the SRCs and startup of all equipment and systems. The CA shall schedule functional tests through the CM, GC and affected Subs. The CA shall direct, witness and document the FT's of all equipment and systems. The Subs shall execute the tests.

2. In general, functional testing is conducted after completion of the start-up plan. The control system is sufficiently tested and approved by the CA before it is used for TAB or to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked.

H. Deficiencies, Non-Conformance, and Approval in Checklists and Startup:

1. The Subcontractors shall clearly list any items of the start-up and functional procedures not successfully completed at the bottom of the form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CA within two days of test completion.

2. The CA reviews and verifies all functional checklists and start-up reports and recommends approval to the PM. The CA assists the Subcontractors and vendors to correct and retest deficiencies or uncompleted items, involving other members of the commissioning team as necessary.

3.4 DEFICIENCY RESOLUTION

A. Documentation

1. The CA shall witness and document the results of all FT's using the specific procedural forms developed for that purpose. Prior to testing, these forms are provided to the GC for review and approval and to the Subs for review.

B. Non-Conformance.

1. The CA shall record the results of the FT on the procedure or test form. All deficiencies shall be noted and reported to the GC and CM on a standard non-compliance form.
2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CA. In such cases the deficiency and resolution will be documented on the procedure form.
3. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. The CA does not have the authority to overlook deficient work or loosen acceptance criteria to satisfy scheduling or cost issues.
4. If commissioning for equipment or systems is delayed by Owner occupancy requirements or other unforeseen conditions, the CA will coordinate completion with Owner's schedule. This may involve testing conducted outside of normal occupancy hours. Contractor assistance will still be required to conduct functional testing outside of normal occupancy hours without any additional cost to the owner.
5. If a deficiency is identified, the CA shall discuss the issue with the executing contractor.
   a. When there is no dispute on the deficiency and the Sub accepts responsibility to correct it:
      i. The CA documents the deficiency, records the Sub's response, and proceeds with remaining FT's. The Sub corrects the deficiency and certifies that the equipment is ready to be retested and coordinates retesting with the GC and CA.
      ii. The CA reschedules the test and the test is repeated.
   b. If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:
      i. The deficiency shall be documented with the Sub's response and a copy given to the GC and to the Sub representative assumed to be responsible.
      ii. Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the A/E. Final acceptance authority is with the Project Manager.
      iii. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency and certifies the equipment is ready for retesting. The CA reschedules the test and the test is repeated until satisfactory performance is achieved.
6. Cost of Retesting
   a. The cost for the Sub to retest a functional test, if they are responsible for the deficiency, shall be borne by the Sub. If the Sub is not responsible, any cost recovery for retesting costs shall be negotiated with the GC.
   b. The time for the CA and CM to direct any retesting required because a specific SRC, reported to have been successfully completed, but determined during functional testing to be faulty, will be backcharged to the GC, who may choose to recover costs from the party responsible for executing the faulty SRC.

7. The Contractor shall respond in writing to the CA and CM at least as often as commissioning meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.

8. The CA retains the original non-conformance forms until the end of the project.

C. Failure Due to Manufacturer Defect

1. If 10% of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the contract documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CM or PM. In such case, the Contractor shall provide the Owner with the following:

a. Within one week of notification from the CM or PM, the Contractor or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the CM or PM within two weeks of the original notice.

b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.

c. The CM or PM will determine whether a replacement of all identical units or a repair is acceptable.

d. One example of the proposed repair solution will be installed by the Contractor and the CM will be allowed to test the installations for up to one week, upon which the CM or PM will decide whether to accept the solution.

e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

D. Approval

1. The CA notes each satisfactorily demonstrated function on the test form. The CA recommends acceptance of each test to the Owner. The Owner gives final approval for acceptance.

3.5 OPERATIONS AND MAINTENANCE DOCUMENTATION

A. The contractor will provide the owner with complete operations and maintenance information. Contractor to provide at a minimum:

1. Basic operation (i.e. narratives of basic equipment operation, interfaces, interlocks, and interaction with other equipment & systems, initial maintenance provided by the contractor).

2. General site operating schedules (i.e. instructions for changes in major system operating schedules, instructions for changes in major system holiday and weekend schedules).

3. Basic troubleshooting (i.e. cite recommended troubleshooting procedures specific to major systems and equipment, manual operation procedures, standby/backup/bypass operation procedures, major system power fail resets and restarts, trend log listing).

4. Recommended maintenance events log (i.e. HVAC air filter replacement schedule and log, building control system sensor calibration schedule and log).

B. Electronic O&M manuals shall be provided for all commissioned systems. Electronic O&M manuals shall consist of all hard-copy O&M manual data in searchable pdf files in a logical folder structure with descriptive file names which make it clear what the manual includes. In all cases, this requires renaming the files from any O&M's cryptic numeric file names.

C. Where electronic data from the manufacturer contains data about other models and features not included in this project, the contractor shall mark the applicable model and features for the equipment in this job in the pdf, so the operations staff can readily identify what equipment model and features in the electronic O&M apply to this building.

3.6 TRAINING OF OWNER PERSONNEL

A. Coordination: The GC shall be responsible for training coordination and scheduling and ultimately for ensuring that training is completed.

B. A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report.

C. In addition to these general requirements, the specific training requirements of Owner personnel by Subs and vendors is specified in Division 21, 23 and 26 . Each Sub and vendor responsible for training will submit a written training plan to the CA for review and approval prior to training. The plan will cover the following elements:

1. System/equipment overview
2. Intended audience
3. Location of training
4. Objectives
5. Subject covered
6. Duration of training on each subject
7. Instructor for each subject
8. Instructor qualifications
9. Methods (lecture, video, site walk-through, written handouts, etc)
10. Review and demonstration of servicing/preventative maintenance
11. Review of record drawings on the system/equipment

D. For the primary HVAC equipment, the controls contractor shall provide a short discussion of the control of the equipment during the mechanical or electrical training conducted by others.

E. Training shall cover a review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal changeover, as applicable, and any emergency procedures.

F. The trainings will be tailored to the needs and skill-level of the trainees and be oriented to the specific system installed in this project.

G. The contractor shall record the training sessions and provide the owner with a training manual and edited DVD of the training sessions.

H. The mechanical design engineer may be required to present the overall system design concept and the design concept of each equipment section at the first training session. This presentation shall be a minimum of 1 hour in length for each discipline (total of 4 to 8 hours) and include a review of all systems using the simplified system schematics (one-line drawings) including heating systems, gas supply systems, supply air systems, exhaust system and outside air strategies.

3.7 DEFERRED TESTING

A. Unforeseen Deferred Tests: If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the PM. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Services of necessary parties will be negotiated.

B. Additional, missing or incomplete functional testing will be done by CA and will back charge to the responsible party. GC is responsible for collecting these charges and expenses from subcontractors.

3.8 FINAL REPORT

A. The final commissioning report shall include an executive summary, list of participants and roles, brief building description, overview of commissioning and testing scope and a general description of testing and verification methods. Outstanding non-compliance items shall be specifically listed.

END OF SECTION 01 91 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.
4. Concrete over steel deck.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, 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.
   1. Mix Design must have minimum 20% fly ash.

C. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

   1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

D. Material Certificates: For each of the following, signed by manufacturers:

   1. Cementitious materials.
   2. Admixtures.
   3. Steel reinforcement and accessories.
   4. Curing compounds.
   5. Vapor retarders.

6. Repair materials.

E. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. 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.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Owner to engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Concrete subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, procedures, curing procedures, construction contraction and isolation joints, 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
   a. Structural 1, B-B or better; mill oiled and edge sealed.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

C. 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.

D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/ A 615M, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A185.

C. Deformed-Steel Wire: ASTM A 496.

2.4 REINFORCEMENT ACCESSORIES

A. 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. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 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
2. Fly Ash: ASTM C 618, Class C

B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

2.7 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class C, not less than 15 mils thick.

1. Available Products:

a. Stego Wrap Vapor Barrier (15-Mil), Stego Industries, LLC

2.8 AGGREGATE BASE AND SAND CUSHION

A. Capillary Base: See Geotechnical Report for material and thickness.

B. Roll prior to installation of Vapor Retarder.

C. Sand Cushion: See Geotechnical Report for materials and thickness.

2.9 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete and compatibility with floor finishes.

1. Available Products:

a. Burke by Edoco; BurkeFilm.
b. ChemMasters; Spray-Film.
c. Euclid Chemical Company (The); Eucobar.
d. Meadows, W. R., Inc.; Sealtight Evapre.

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.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

2. Fly Ash: ASTM C 618.

B. Admixtures: Use admixtures according to manufacturer's written instructions.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 2500 psi unless otherwise noted, 4 minimum sack at 28 days.

2. Slump Limit: 4 ½ inches maximum for concrete with verified slump of 2 to 4 inches, before adding high-range, water-reducing admixture or plasticizing admixture.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000 psi, 4 minimum sack at 28 days.

2. Slump Limit: 4 ½ inches maximum.

C. Concrete-on-Steel Deck: Proportion light-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000 psi

2. Slump Limit: 4 ½ inches maximum.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and ASTM C 1116, 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 (32 deg C), reduce mixing and delivery time to 60 minutes.

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.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-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, reglets, 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. Do not chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, 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."

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 (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are 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. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 12 inches and seal with manufacturer's recommended tape.

2. All punctures and holes shall be repaired prior to concrete pour.

B. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

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. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
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-third of concrete thickness as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide x (1/3)x(slab depth) deep joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks, within 24 hours maximum after pour.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

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 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten 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.

1. Apply a trowel finish to surfaces to be covered with resilient flooring and carpet.

2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
   a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-foot-long straightedge resting on 2 high spots and placed anywhere on the surface does not exceed 1/8 inch.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. 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.

3.10 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 301 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. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. 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. 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.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling 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.

3.12 APPLICATION OF 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 in accordance with manufacturer’s written instructions.
1. Concrete Floor Sealer: Koster 1 2000 FS.

3.13 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 in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. 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. 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 (19-mm) 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.
5. Repair random cracks and single holes 1 inch (25 mm) 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.

3.14 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Verification of use of required design mixture.
2. Concrete placement, including conveying and depositing.
3. Slump: ASTM C143; one test at point of placement at start of each day’s pour, additional tests when concrete consistency appears to have changed.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to UBC Section 1929 for concrete and Section 1903.3 for aggregates and shall be performed according to the following requirements:

1. Testing Frequency: Obtain one set of four samples for each 100 cu. yd or fraction thereof of each concrete mixture placed each day.
2. Compressive-Strength Tests: UBC Section 1905.6 and ASTM C 39; test one specimen at 7 days and two specimens at 28 days and retain one specimen.
3. Seven-day compressive strengths are to be used as guides to 28-day strengths. In general, 7-day strengths shall be equal to at least 65 percent of the required 28-day

strength. Failure of tests to meet these 7-day strengths may require revision of the mix design.

4. Twenty-eight-day compressive strengths shall meet design strength in accordance with UBC Section 1905.6.
5. When the concrete tests do not meet the requirements for either the 7 or 28 day tests (56 day test when fly ash is used), modify the mix design of the concrete remaining to be placed if directed by the Architect/Engineer with no increase in the Contract price.
6. 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.
7. 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.
8. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, 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 or by other methods as directed by Architect.
9. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
10. Correct deficiencies in the Work that test reports and inspections indicate dos not comply with the Contract Documents.

END OF SECTION 03 30 00

SECTION 04 81 00 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. Regular decorative concrete masonry units.
2. Mortar and grout.
3. Reinforcing steel.
4. Miscellaneous masonry accessories.
5. Metal fabrications.

1.3 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

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

B. Samples for Initial Selection: For the following:

1. Decorative concrete masonry units, in the form of small-scale units.
2. Colored mortar.

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.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.

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

1. Include test reports, per UBC Standard 21-16, for mortar mixes required to comply with property specification.

2. Include test reports, per UBC Standard 21-18, for grout mixes required to comply with compressive strength requirement.

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 and color lot 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. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

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 pre-blended, 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. 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 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 uses 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.

2.3 CONCRETE MASONRY UNITS (CMUs)

A. Decorative Concrete Masonry Units: UBC Standard 21-4.

1. Weight Classification: Normal weight

2. Size: 8” x 8” x 16”
3. Pattern and Texture:

a. Standard pattern, split-face finish on all exposed sides.

4. Colors: As selected by Architect from manufacturer's full range.
4. Available Products:

a. Calstone; Split-face

b. Color: 6335

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or 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: UBC Standard 21-13, 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: UBC Standard 21-11.

E. Mortar Cement: UBC Standard 21-14.

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

1. Color to be selected by Architect form manufacturer’s available color selection.

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.

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.

I. Aggregate for Grout: ASTM C 404.

J. Water: Potable.

2.5 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615, Grade 60.

2.6 MISCELLANEOUS ANCHORS

A. Anchor Bolts: L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of dimensions indicated.

B. Postinstalled Anchors: Provide torque-controlled expansion anchors, with capability to sustain, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).

2.7 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. Available Manufacturers:

    a. Diedrich Technologies, Inc.
    b. EaCo Chem, Inc.
    c. ProSoCo, Inc.

2.8 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. 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 UBC Standard 21-15, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S.

D. Pigmented Mortar: Use colored cement product.

E. Grout for Unit Masonry: Comply with UBC Standard 21-19.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 21-C in the Uniform Building Code for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

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. 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. 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.

C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

D. 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, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet maximum.
2. For conspicuous horizontal lines, do not vary from level by more than 1/4 inch in 20 feet.

3.3 LAYING MASONRY

A. Bond Pattern for Exposed Masonry: 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.

B. 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, and wet brick if required before laying fresh masonry.

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

D. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow 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 grouted masonry, including starting course on footings.
3. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

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

3.5 REINFORCED UNIT MASONRY INSTALLATION

A. Placing Reinforcement: Comply with requirements in Section 2104.5 in the Uniform Building Code.

B. 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 Section 2104.6 in the Uniform 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 60 inches.

3.6 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 non-masonry 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.

3.7 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 04 81 00

SECTION 05 12 00 - 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 1 Specification Sections, apply this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Prefabricated building columns.
3. Shear stud connectors, shop and field welded.
4. Shrinkage-resistant grout.

B. Related Requirements:
1. DIVISION 5 – Metal Pan Stairs
2. DIVISION 5 – Pipe and Tube Railings

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

B. Protected Zone: Structural members or portions of structural members indicated as "protected zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.

1.4 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written 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.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials with **minimum of 10% recycled content**.
2. High-strength, bolt-nut-washer assemblies.
3. Shear stud connectors.

4. Anchor rods.
5. Threaded rods.
6. Shop primer.
7. Galvanized-steel primer.
8. Etching cleaner.
9. Galvanized repair paint.
10. Shrinkage-resistant grout.

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.
4. Identify members not to be shop primed.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant.

B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.

C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

1.7 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.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992 Grade 50

B. Channels, Angles: ASTM A36 Grade 36

C. Plate and Bar: Bars ASTM A36 Grade 36, Plates ASTM A36 Grade 36 or ASTM A572 Grade 50 per Construction Documents.

D. Cold-Formed Hollow Structural Sections: ASTM A500, Grade B structural tubing.

E. Steel Pipe: ASTM A53, Grade B.

F. Welding Electrodes: E70XX

2.2 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125, Grade A325 bolts, Grade A563 heavy-hex carbon-steel nuts, Grade F436 hardened carbon-steel washers.

1. Finish: Mechanically deposited zinc coating interior, hot-dip galvanizing coating exterior.

B. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

2.3 RODS

A. Unheaded Anchor Rods: ASTM F1554, Grade 36 or ASTM F1554, Grade 55, as noted in Construction Documents.

1. Configuration: Straight, Hooked.
2. Nuts: ASTM A563 heavy-hex carbon steel.
3. Plate Washers: ASTM A36 carbon steel.
4. Washers: ASTM F436, hardened carbon steel.
5. Finish: See Construction Documents.

B. Headed Anchor Rods: ASTM F1554, Grade 36 or ASTM F1554, Grade 55, as noted in Construction Documents.

1. Nuts: ASTM A563 heavy-hex carbon steel.
2. Plate Washers: ASTM A36 carbon steel.
3. Washers: ASTM F436, hardened carbon steel.
4. Finish: See Construction Documents.

C. Threaded Rods: ASTM F1554, Grade 36 or ASTM F1554, Grade 55, as noted in Construction Documents.

1. Nuts: ASTM A563 heavy-hex carbon steel.
2. Washers: ASTM F436, hardened carbon steel.

2.4 PRIMER

A. Steel Primer:
1. SSPC-Paint 23, latex primer.
2. Galvanizing Repair Paint: ASTM A780/A780M.

2.5 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
3. Mark and match-mark materials for field assembly.
4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

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

D. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

2.7 SHOP CONNECTIONS

A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish per Construction Documents: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

2.9 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 receive sprayed fire-resistive materials (applied fireproofing).
4. Galvanized surfaces.

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

C. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner or in accordance with SSPC-SP 16.

2.10 SOURCE QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform shop tests and inspections.

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

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 on Drawings.

1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with AISC's "Code of Standard Practice for Steel Buildings and Bridges."

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

C. 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 are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

D. Splice members only where indicated.

E. Do not use thermal cutting during erection unless approved by Engineer of record.

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

3.4 FIELD CONNECTIONS

A. Bolts: Install bolts snug tight.

B. Weld Connections: Comply with AWS D1.1/D1.1M welding procedure specifications, weld quality, and methods used in correcting welding work.

C. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

3.5 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

B. Touchup Painting:

1. 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.

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

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspection agency to inspect field welds.

1. Welded Connections: Visually inspect field welds in accordance with AWS D1.1.

2. Shear Stud Connectors: Visually inspect shear connectors according to requirements in AWS D1.1 for stud welding.

3. Correct deficiencies in work that test reports and inspections indicate does not comply with the Construction Documents.

END OF SECTION 05 12 00

SECTION 05 21 00 - STEEL JOIST 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. K-series steel joists.
2. LH-series long-span steel joists.
3. Steel joist accessories.

1.3 DEFINITIONS

A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 SUBMITTALS

A. Shop Drawings: Show layout, designation, number, type, locations, and spacing of joists. Include anchorage details, bracing, bridging, joist accessories.

1. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."

1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Nucor Vulcraft

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide joists and connections capable of withstanding design loads indicated on Drawings.

1. Use ASD; data are given at service-load level**.**
2. Design joists to withstand design loads with live-load deflections no greater than the following:

a. Floor Joists: Vertical deflection of 1/360 of the span.
b. Roof Joists: Vertical deflection of 1/240 of the span.

2.3 STEEL JOISTS

A. K-Series Steel Joist: Manufactured steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.

1. Joist Type: K-series steel joists.
2. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated on Drawings, complying with SJI's "Specifications."
3. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated on Drawings, complying with SJI's "Specifications."
4. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

B. Long-Span Steel Joist: Manufactured steel joists according to "Standard Specification for Longspan Steel Joists, LH-Series in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as indicated on Drawings.

1. Joist Type: LH-series long-span steel joists.

2.4 STEEL JOIST ACCESSORIES

A. Provide bridging anchors and bridging of material, size, and type required by SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

1. Furnish additional erection bridging if required for stability.

B. Schematically indicated. Detail and fabricate according to SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

C. Fabricate as indicated on Drawings and according to SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
   1. Furnish additional erection bridging if required for stability.

D. Bolts, Nuts, and Washers: ASTM F3125, Grade A325, heavy-hex steel structural bolts; ASTM A563, and ASTM F436, hardened carbon-steel washers.

E. Welding Electrodes: E70XX comply with AWS standards.

2.5 CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, 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.

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications" joist manufacturer's written instructions, and requirements in this Section.

   1. Before installation, splice joists delivered to Project site in more than one piece.
   2. Space, adjust, and align joists accurately in location before permanently fastening.
   3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
   4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads are applied.

C. Field weld joists to supporting steel framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts.

E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for high-strength structural bolt installation and tightening requirements.

F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 REPAIRS

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

B. Touchup Painting:

1. Immediately after installation, clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, abutting structural steel, and accessories.

   a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
   b. Apply a compatible primer of same type as primer used on adjacent surfaces.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspection agency to perform tests and inspections.

B. Visually inspect field welds according to AWS D1.1.

END OF SECTION 05 21 00

SECTION 05 31 00 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply this Section.

1.2 SUMMARY

Section Includes:

1. Roof deck.
2. Composite floor deck.
3. Trash Enclosure Gate Panels

1.3 SUBMITTALS

A. Certificates:

1. Welding certificates.
2. Product Certificates: For each type of steel deck.

B. Test and Evaluation Reports:

1. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
   a. Power-actuated mechanical fasteners.

2. Research Reports: For steel deck, from ICC-ES showing compliance with the building code.

3. Product Data: For each type of deck, accessory, and product indicated provide design computations for the structural properties of the deck units or SDI certification that the units are designed in accordance with the SDI specifications.

C. Field Quality-Control Submittals:

1. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding codes:

   a. AWS D1.1/D1.1M.

b. AWS D1.3/D1.3M.

B. Electrical Raceway Units: Provide UL-labeled cellular floor-deck units complying with UL 209 and listed in UL's "Electrical Construction Equipment Directory" for use with standard header ducts and outlets for electrical distribution systems.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Manufacturers

1. Nucor Corp.: Vulcraft Division.

2. Verco Manufacturing Co.

B Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:

1. Prime-Painted Steel Sheet: ASTM A1008, Structural Steel (SS), Grade 50 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.

a. Color: Manufacturer's standard

2. Galvanized-Steel Sheet: ASTM A653, Structural Steel (SS), Grade 50 zinc coating.
3. Galvanized- and Shop-Primed Steel Sheet: ASTM A653, Structural Steel (SS), Grade 50 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.

a. Color: Manufacturer's standard
4. Deck Profile: As indicated on Construction Documents.
5. Profile Depth: As indicated on Construction Documents
6. Design Uncoated-Steel Thickness: As indicated on Construction Documents
7. Span Condition: As indicated on Construction Documents
8. Side Laps: As indicated on Construction Documents

2.2 COMPOSITE FLOOR DECK

A. Manufacturers

1. Nucor Corp.: Vulcraft Division.

2. Verco Manufacturing Co.

B. Composite Vented Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and vented-steel with interlocking side laps, to comply with SDI C, with the minimum section properties indicated, and with the following:

1. Prime-Painted Steel Sheet: ASTM A1008, Structural Steel (SS), Grade 50 minimum, with top surface phosphatized and unpainted and underside surface shop primed with manufacturers' standard baked-on, rust-inhibitive primer.
2. Galvanized-Steel Sheet: ASTM A653, Structural Steel (SS), Grade 50 zinc coating.
3. Galvanized- and Shop-Primed Steel Sheet: ASTM A653, Structural Steel (SS), Grade 50 zinc coating; with unpainted top surface and cleaned and pretreated bottom surface primed with manufacturer's standard baked-on, rust-inhibitive primer.
4. Profile Depth: As indicated on Construction Documents.
5. Design Uncoated-Steel Thickness: As indicated on Construction Documents.
6. Span Condition: As indicated on Construction Documents.
7. Vent Slot Area: Manufacturer's standard vent slots.

2.3 ACCESSORIES

A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile as indicated on Construction Documents.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

H. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

I. Galvanizing Repair Paint: ASTM A780.

J. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions 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, GENERAL

A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.

B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install in accordance with deck manufacturer's written instructions.

J. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 INSTALLATION OF ROOF DECK

A. Fasten roof-deck panels to steel supporting members as indicated per Construction Documents, and as follows:

1. Type of fasteners: As indicated on Construction Documents.

2. Fastener spacing: As indicated on Construction Documents.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18 inches, and as follows:

1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
2. Mechanically clinch or button punch.
3. Fasten with a minimum of 1-1/2-inch- long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 inches, with end joints as follows:

1. End Joints: Lapped 2 inches minimum.

2. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

3.5 INSTALLATION OF FLOOR DECK

A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:

1. Weld Diameter: As indicated on Construction Documents.
2. Weld Spacing: As indicated on Construction Documents.

   a. Weld edge ribs of panels at each support as indicated on Construction Documents.
   b. Space and locate welds as indicated on Construction Documents.

3. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18 inches, and as follows:
1. Mechanically clinch or button punch.
2. Fasten with a minimum of 1-1/2-inch-long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2 inches, with end joints as follows:

1. End Joints: Lapped 2 inches minimum.

D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure in accordance with SDI recommendations unless otherwise indicated.

3.6 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

B. Repair Painting:

1. Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.
2. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspection agency to perform tests and inspections.

B. Tests and Inspections:

1. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.

   a. Field welds will be subject to inspection.

2. Steel decking will be considered defective if it does not pass tests and inspections.
3. Shear Stud Connectors: Visual inspection of welds.

C. Prepare test and inspection reports.

END OF SECTION 05 31 00

SECTION 05 40 00 - COLD-FORMED METAL 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. Exterior load-bearing wall framing.
2. Interior non-load-bearing wall framing.
3. Ceiling joist framing.
4. Soffit framing.

B. Related Requirements:
1. Division 9 Gypsum Board

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Cold-formed steel framing materials.
2. Exterior load-bearing wall framing.
3. Interior non-load-bearing wall framing.
4. Vertical deflection clips.
5. Drift clips.
6. Ceiling joist framing.
7. Post-installed anchors.
8. Power-actuated anchors.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

B. Research Reports:

1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
2. For sill sealer gasket/termite barrier, showing compliance with ICC-ES AC380.

1.5 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Stud Manufacturers Association.

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."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to:

Dietrich Industries Inc. or equal

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.

B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
1. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
a. Exterior Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height.
b. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft.
c. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for live loads and 1/240 for total loads of the span.

C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:

2.3 COLD-FORMED STEEL FRAMING MATERIALS

1. Grade: As indicated per Construction Documents.
2. Coating: G60

2.4 EXTERIOR LOAD-BEARING WALL FRAMING

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

1. Minimum Base-Metal Thickness: As indicated per Construction Documents.

2. Flange Width: As indicated per Construction Documents.
3. Section Properties: As indicated per Construction Documents.

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

1. Minimum Base-Metal Thickness: As indicated per Construction Documents.
2. Flange Width: As indicated per Construction Documents.

C. 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 through positive mechanical attachment to stud web and structure.

2.5 INTERIOR NON-LOAD-BEARING WALL FRAMING

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

1. Minimum Base-Metal Thickness: As indicated per Construction Documents.
2. Flange Width: As indicated per Construction Documents.
3. Section Properties: As indicated per Construction Documents.

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

1. Minimum Base-Metal Thickness: As indicated per Construction Documents.
2. Flange Width: As indicated per Construction Documents.
3. Flange Width: As indicated per Construction Documents.

2.6 CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, punched with standard holes**,** with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: As indicated per Construction Documents.
2. Flange Width: As indicated per Construction Documents.
3. Section Properties: As indicated per Construction Documents.

2.7 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Bracing, bridging, and solid blocking.
2. Web stiffeners.
3. Anchor clips.
4. End clips.
5. Stud kickers and knee braces.

2.8 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123.

B. Anchor Bolts: ASTM F1554, Grade 36.

C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible.

1. Uses: Securing cold-formed steel framing to structure.

D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

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

2.9 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A780.

2.10 FABRICATION

A. Fabricate cold-formed steel 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 steel framing members by welding, screw fastening, clinch fastening, pneumatic pin 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 screws penetrating joined members by no fewer than three exposed screw threads.

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

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

2.11 EXAMINATION

A. Examine substrates, areas, conditions, 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.

2.12 INSTALLATION, GENERAL

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

B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed steel 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 steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

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

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

F. Install temporary bracing and supports to secure framing and support loads equal 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.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

2.13 INSTALLATION OF EXTERIOR NONLOAD BEARING WALL FRAMING

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As indicated per Construction Documents.

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

D. Install horizontal bridging in wall studs, spaced vertically in rows not more than 48 inches apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

2.14 INTERIOR NONLOADBEARING WALL FRAMING

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As indicated per Construction Documents.

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

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

2.15 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.

2.16 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

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

2.17 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Sign Posts.
3. Metal ladders.
4. Metal gates at trash enclosure.
5. Play area fence.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.3 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Provide exterior metal fabrications that 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 connections, and other detrimental effects. Base engineering calculation 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.

1.4 SUBMITTALS

A. 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.

1.5 QUALITY ASSURANCE

A. 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."

1.6 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.

1.7 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. Galvanized fabrications

1. Gates and gate frames.
2. Embedded items into concrete or masonry.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

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.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36.

B. Steel Tubing: ASTM A 500, cold-formed steel tubing.

C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

D. Wire Cloth: See Landscaping Drawing Detail 8/L-2.- for fence detail.

E. Gate Hinges: Type 304 stainless steel.

F. Trash Enclosure Gate Panels: 1 ½" B-Deck Verco-36, Galvanized and field paint.

2.3 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, nuts and, where indicated, flat washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 1.

D. Anchor Bolts: ASTM F 1554, Grade 36.

1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts.

E. Eyebolts: ASTM A 489.

F. Machine Screws: ASME B18.6.3.

G. Lag Bolts: ASME B18.2.1.

H. Wood Screws: Flat head, ASME B18.6.1.

I. Plain Washers: Round, ASME B18.22.1.

J. Lock Washers: Helical, spring type, ASME B18.21.1.

K. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and 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.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group 1 stainless-steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

2.4 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 9 painting Sections.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

1. Use primer with a VOC content of 420 g/L (3.5 lb/gal. or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
b. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
c. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
d. Tnemec Company, Inc.; Tneme-Zinc 90-97.

D. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 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; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches) o.c., unless otherwise indicated.

2.6 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. Furnish inserts if units are installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.7 METAL LADDERS

A. General:

1. Comply with ANSI A14.3 and OSHA requirements, unless otherwise indicated.
2. Space siderails 18 inches apart, unless otherwise indicated.
3. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted brackets, made from same metal as ladder.

B. Steel Ladders:

1. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges.
2. Rungs: 3/4-inch- diameter steel bars.
3. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.

4. Prime interior ladders including brackets and fasteners, with zinc-rich primer ladder safety system.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123/A 123M, for galvanizing steel and iron products.
2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

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.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

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.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 50 00

SECTION 05 51 13 - METAL PAN STAIRS

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. Preassembled steel stairs with concrete-filled treads.
2. Steel tube railings and guards attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.

1.3 COORDINATION

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

B. Coordinate installation of anchorages for metal stairs, railings, and guards.

1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
2. Deliver such items to Project site in time for installation.

C. Schedule installation of railings and guards so wall attachments are made only to completed walls.

1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For metal pan stairs and the following:
1. Abrasive nosings.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Include plan at each level.

4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

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

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

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."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification.

1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
2. Protect steel members and packaged materials from corrosion and deterioration.
3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.

a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs, railings and guards, including attachment to building construction.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft.
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360or 1/4 inch, whichever is less.

C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2.2 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components 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 A36/A36M.

C. Steel Tubing for Railings and Guards: ASTM A500/A500M (cold formed) or ASTM A513/A513M.

D. Steel Pipe for Railings and Guards: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

E. Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A1008M, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.

F. Uncoated, Hot-Rolled Steel Sheet: ASTM A1011/A1011M, either commercial steel, Type B, or] structural steel, Grade 30, unless another grade is required by design loads.

2.3 ABRASIVE NOSINGS

A. Extruded Units: Aluminum units with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions.
1. Provide ribbed units, with abrasive filler strips projecting 1/16 inch above aluminum extrusion.

B. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

C. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.

D. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

2.4 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5 where built into exterior walls.

1. Select fasteners for type, grade, and class required.

B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.

C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

D. Post-Installed Anchors: Torque-controlled expansion anchors [or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

A. Handrail Wall Brackets: Cast nickel-silver or Cast bronze.

B. Welding Electrodes: Comply with AWS requirements.

C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

F. Prefilled Concrete Treads:

1. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with minimum 28-day compressive strength of 3000 psi and maximum aggregate size of 1/2 inch unless otherwise indicated.
2. Nonslip-Aggregate Concrete Finish: Factory-packaged abrasive aggregate made from fused, aluminum-oxide grits or crushed emery; rustproof and nonglazing; unaffected by freezing, moisture, or cleaning materials.
3. Plain Steel Welded-Wire Reinforcement: ASTM A1064/A10645M, steel,] 6 by 6 inches, W1.4 by W1.4, unless otherwise indicated on Drawings.

4. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded-wire reinforcement in place.

a. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.

G. For galvanized reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.6 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts,[railings and guards,] clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs and railings in shop to greatest extent possible.

1. Disassemble units only as necessary for shipping and handling limitations.
2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

F. 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. Weld exposed corners and seams continuously unless otherwise indicated.
5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 - Completely sanded joint with some undercutting and pinholes okay.

2.7 FABRICATION OF STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Architectural Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel channels or steel rectangular tubes as indicated on Drawings.

   a. Stringer Size: As required to comply with "Performance Requirements" Article.
   b. Provide closures for exposed ends of channel and rectangular tube stringers.
   c. Finish: Shop primed.

2. Construct platforms of steel plate for concrete filled finish as indicated on Drawings.

a. Provide closures for exposed ends of channel and rectangular tube framing.
b. Finish: Shop primed.

3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.

2.8 FABRICATION OF STAIR RAILINGS AND GUARDS

A. Comply with applicable requirements in Section 055213 "Pipe and Tube Railings."

B. Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.
1. Picket Infill: 3/4-inch-round pickets spaced to prohibit the passage of a 4-inch.

C. Welded Connections: Fabricate railings and guards with welded connections.

1. Fabricate connections that are exposed to weather in a manner that excludes water.

a. Provide weep holes where water may accumulate internally.

2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
3. Weld all around at connections, including at fittings.
4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
5. Obtain fusion without undercut or overlap.
6. Remove flux immediately.
7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 - Completely sanded joint, some undercutting and pinholes are okay as shown in NAAMM AMP 521.

D. Form changes in direction of railings and guards as follows:

1. As detailed.
2. By bending or by inserting prefabricated elbow fittings.
3. By flush bends or by inserting prefabricated flush-elbow fittings.

E. 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.

F. Close exposed ends of railing and guard members with prefabricated end fittings.

G. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

H. Connect posts to stair framing by direct welding unless otherwise indicated.

I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
2. For nongalvanized railings and guards, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.

J. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.

1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.9 FINISHES

A. Finish metal stairs after assembly.

B. Preparation for Shop Priming: Prepare uncoated, ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.

1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.

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

C. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

1. Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.

a. Clean bottom surface of plates.
b. Set plates for structural members on wedges, shims, or setting nuts.
c. Tighten anchor bolts after supported members have been positioned and plumbed.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Fit exposed connections accurately together to form hairline joints.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
2. 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.
3. Comply with requirements for welding in "Fabrication, General" Article.

F. Install precast concrete treads with adhesive supplied by manufacturer.

3.2 INSTALLATION OF RAILINGS AND GUARDS

A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

1. Space posts at spacing indicated or, if not indicated, as required by design loads.
2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.
3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.
4. Secure posts, rail ends, and guard ends to building construction as follows:

   a. Anchor posts to steel by welding to steel supporting members.
   b. Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.

B. Attach handrails to wall with wall brackets.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
2. Secure wall brackets to building construction as required to comply with performance requirements.

3.3 REPAIR

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 05 51 13

SECTION 05 51 70 – MISCELLANEOUS METALS

PART 1 - GENERAL

1. RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

2. DESCRIPTION OF WORK

A. Extent: Furnish all labor, material, equipment, tools, and incidentals necessary for the fabrication and installation of miscellaneous metalwork as shown on the Drawings and as specified in this Section and other Sections of these Specifications. The work includes but is not limited to:
1. Installation of steel fences.
2. Installation of concrete footings associated with metalwork items.
3. Provision of clip angles, connectors, machine bolts, lag bolts, screws, anchor bolts, and all other miscellaneous metal items not specified elsewhere.
4. Painting metalwork items as specified.

B. Related work includes but is not limited to:
1. Site Concrete
2. Exterior Painting
3. Wood Construction

3. STANDARDS

A. Applicable ASTM International Standards (latest revisions) as they apply to this work and related test methods, including:
1. A29 / A29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought, General Requirements for
2. A36 / A36M Specification for Carbon Structural Steel
3. A53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
4. A153 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
5. A307 Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
6. A500 Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
7. A501 Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
8. ASTM A618 Specification for Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing
9. B633 Specification for Electrodeposited Coatings of Zinc on Iron and Steel
10. F2329 Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

B. Applicable American Welding Society (AWS) Standards (latest revisions) as they apply to this work including:
1. D1.1 Structural Welding Code - Steel

2. D1.2 Structural Welding Code - Aluminum
3. D1.3 Structural Welding Code - Sheet Steel
4. D1.6 Structural Welding Code - Stainless Steel

4. QUALITY ASSURANCE

A. Qualifications of Welder: Use only certified welders for all welding performed in connection with the work of this Section.

B. Protection: Use all means necessary to protect miscellaneous metal before, during, and after installation, and to protect the installed work and materials of other trades.

C. Corrosion Control: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

5. SUBMITTALS

A. Shop Drawings: Within fourteen (14) days of Notice to Proceed, submit Shop Drawings of the following items for review and approval by the Engineer in accordance with the Special Provisions of these Specifications. Show all locations, markings, quantities, materials, sizes, and shapes, and indicate all methods of connecting, anchoring, fastening, bracing, and attaching to the work of other trades.
1. Gate

6. DELIVERY, STORAGE AND HANDLING

A. Package, deliver, unload, and store metalwork items so as not to be damaged or deformed.

PART 2 - PRODUCTS

1. METAL MATERIALS

A. General: All steel / metal shall be new material.

B. Pipe: All pipe shall be free from rust, and shall conform to the requirements of ASTM A53.

C. Steel Tubing: All steel tubing shall be free from rust, and shall conform to the requirements of ASTM A500 or ASTM A501.

D. Bar Stock: All flat strap and bar stock shall be free from rust and shall conform to the requirements of ASTM A29.

E. Steel Plate: All steel plate, shall be free from rust, and shall conform to the requirements of ASTM A36.

F. Fasteners: All bolts, nuts, washers and other fasteners shall be free from rust, and shall conform to the requirements of ASTM A307.

1. Steel / Galvanized steel components: Hot-dip galvanized fasteners, complying with ASTM B633, and suitable for exterior use.
2. Aluminum components: Type 316 stainless steel fasteners
3. Stainless steel components: Type 316 stainless steel fasteners
4. Dissimilar metals: Type 316 stainless steel fasteners

2. OTHER MATERIALS

A. All other materials not specifically described but required for a complete and proper installation of miscellaneous metal, shall be new, free from rust, the best quality of their respective kinds; they shall be subject to the approval of the Engineer.

PART 3 - EXECUTION

1. GENERAL

A. Compliance: Fabricate all miscellaneous metal in strict accordance with the approved Shop Drawings and the referenced standards.

B. Pre-fabrication: Insofar as possible, shop pre-fabricate all items complete and ready for installation.

C. Welding: Unless otherwise indicated on the Drawings, weld all connections.
1. Make all joints and intersections of metal tightly fitting and securely fastening.
2. Make all work square, plumb, straight, and true.
3. All welds to be ground smooth.

D. Holes: Drill or punch all holes required for the attachment of work of other trades and for bolted connections. Burned holes are not acceptable.

E. Brackets, Flanges, and Anchors: Provide brackets, flanges, and anchors for railing posts and for handrail supports. Furnish inserts and sleeves as required for anchorage to concrete work.

2. INSTALLATION

A. Cutting, Fitting, and Placement:
1. Perform cutting, drilling, and fitting required for installation. Set the work accurately in location, alignment, and elevation; plumb, level, true, and free of rack, measured from established lines and levels.
2. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop-welded because of shipping size limitations. Grind joints smooth and touch up shop paint coat. Do not weld, cut, or abrade the surfaces of units which have been coated or finished after fabrication, and are intended for field connections.

B. Coordination: Coordinate installation schedule with the schedules of other trades to ensure orderly and timely progress of the total work.

C. Touching Up: After the erection and installation are complete, touch up all minor damage to shop galvanizing caused during transportation and erection, using the specified galvanizing

compound. The Engineer will determine what constitutes "minor damage" and what damage requires replacement.

3. PAINTING

A. All iron and steel materials that are not noted as galvanized or to remain untreated shall be primed and painted as specified on the Drawings and in Specification Section Exterior Painting.

END OF SECTION 05 51 70

SECTION 05 5 213 - PIPE AND TUBE RAILINGS

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 railings.

B. Related Requirements:
1. DIVISION 5 – Structural Steel
2. DIVISION 5 – Metal Pan Stairs

1.3 COORDINATION

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

B. Coordinate installation of anchorages for railings. 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.

1.4 ACTION SUBMITTALS

A. Product Data:
1. Expanded metal infill panels.
2. Post-installed anchors.
3. Handrail brackets.
4. Nonshrink, nonmetallic grout.
5. Anchoring cement.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.

C. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

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

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 STEEL RAILINGS

A. Tubing: ASTM A500/A500M (cold formed) or ASTM A513/A513M, Type 5.

B. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations and where indicated.

C. Plates, Shapes, and Bars: ASTM A36/A36M.

D. Cast Iron Fittings: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.

2.4 FASTENERS

A. Fastener Materials:
1. Hot-Dip Galvanized Railing Components: Type 304 stainless steel or hot-dip zinc-coated steel fasteners complying with ASTM A153/A153M or ASTM F2329/F2329M for zinc coating.
2. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction.

2.5 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast iron..

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water.

1. Provide weep holes where water may accumulate.
2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion

I. Form changes in direction as follows:

1. As detailed.

J. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

L. 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.

M. 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.

N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.

1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 ATTACHING RAILINGS

A. Anchor railing ends to concrete with flanges connected to railing ends and anchored to wall construction with anchors and bolts.

B. Attach handrails to walls with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

1. 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.

3.4 CLEANING

A. Clean by washing thoroughly with clean water and soap and rinsing with clean water.

3.5 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 52 13

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.
2. Framing with timber.
3. Wood blocking, cants, and nailers.
4. Wood furring and grounds.
5. Wall Sheathing.

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.

B. Exposed Framing: Dimension lumber not concealed by other construction.

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 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 QUALITY ASSURANCE

A. Source Limitations for Engineered Wood Products: Obtain each type of engineered wood product through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Metal Framing Anchors:

a. KC Metals Products, Inc.
b. Silver Metal Products, Inc.
c. Simpson Strong-Tie Company, Inc.

2.2 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.
5. Provide dry lumber with 19 percent maximum moisture content at time of dressing for headers and beams, unless otherwise indicated.

B. Wood Structural Panels:

1. Plywood: DOC PS 1, **max. formaldehyde limit .05 PPM.**
2. Thickness: As needed to comply with requirements specified per structural plans but not less than thickness indicated.
3. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
4. Factory mark panels according to indicated standard.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) and AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and one of the following:

B. Maximum moisture content of 21 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece, or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.4 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated on the drawings and according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.

1. Species and Grade: Pressure treated Douglas fir-larch, Douglas fir-larch (north); No. 1 grade; NLGA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including the following:

1. Rooftop equipment bases and support curbs.
2. Blocking.
3. Cants.
4. Nailers.
5. Furring.
6. Grounds.

B. For items of dimension lumber size, provide No. 1 grade lumber with 19 percent maximum moisture content and the following species:

1. Pressure treated Douglas fir-larch, Douglas fir-larch (north).

2.6 SHEATHING

A. Plywood Wall Sheathing: Exterior sheathing – See Structural Drawings.

1. Span Rating: Not less than 32/16.
2. Thickness: Not less than 5/8 inch, see structural drawings.

2.7 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick. See Plan for locations.

2.8 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure treated, or in area of high relative humidity, provide fasteners of galvanized steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: CABO 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.

1. Anchor bolts required to be galvanized.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.9 METAL FRAMING ANCHORS

A. General: Provide framing anchors made from metal indicated, of structural capacity, type, and size indicated, and as follows:

1. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.
2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values

shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Lay out framing system after review of documents and after coordinating with other trades to provide recessed piping, conduit, fixtures, equipment and locations of building elements and equipment.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven fasteners.
2. Published requirements of metal framing anchor manufacturer.
3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in the Uniform Building Code.

F. Use common, galvanized 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 between members. Install fasteners without splitting wood; predrill as required.

G. Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

3.2 WOOD FRAMING INSTALLATION, GENERAL

A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.

3.3 RAFTER FRAMING INSTALLATION

A. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers.

Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions, if any.

END OF SECTION 06 10 00

SECTION 06 20 00 - FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Installation of reinforced panels for wainscots.
   2. Installation of contractor or owner provided accessories, fixtures or equipment.
   3. Installation of painted rated plywood panels in Electrical Plans
   4. Installation of Siding Panels on Exterior Walls and Parapets.
   5. Miscellaneous install and adjusting of installed items.

B. Related Sections include the following:

   1. Division 7 Composite Wall Panels.
   2. Division 7 Siding

1.3 DEFINITIONS

A. Inspection agencies, and the abbreviations used to reference them, include the following:

   1. WCLIB - West Coast Lumber Inspection Bureau.
   2. WWPA - Western Wood Products Association.

1.4 SUBMITTALS

A. Submit three samples of fiberglass reinforced panel colors for approval by Architect.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect materials against weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

B. Deliver interior finish carpentry only when environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed according to manufacturer's written instructions and warranty requirements and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by the American Lumber Standards' Committee Board of Review.

1. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
2. For exposed lumber, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by inspection agency.
3. Moisture Content: 19% maximum.

B. MDF Interior Trim at Partitions
1. See plans for detail and prepare for painting.

2.2 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches into substrate, unless otherwise recommended by manufacturer:

1. Stainless steel.
2. Hot-dip galvanized steel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
4. Coordinate finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate finish carpentry.

3.4 ADJUSTING

A. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.5 CLEANING

A. Clean finish carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 20 00

SECTION 06 41 10 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

Solid Surface countertops

1.03 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated, including cabinet hardware and accessories.

B. Product Data: For high-pressure decorative laminate cabinet hardware and accessories.

C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets and other items installed in architectural woodwork.
4. Show pathways for utilities/distribution.

D. Samples for Initial Color Selection:

1. Solid Surface Counter top selection listed on drawings.

1.05 QUALITY ASSURANCE

A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers

B. Quality Standard: Unless otherwise indicated, comply with WI's "Manual of Millwork" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with such selections and requirements in addition to the quality standard.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork 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.

B. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.

C. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.08 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that comply with requirements of WI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Products: Comply with the following:
1. Softwood Plywood: DOC PS 1.

D. Acceptance of defective or non-conforming work: If the Agency prefers to accept defective or non-conforming work, it may do so instead of requiring its removal and correction, in which case a change order will be issued to reflect an appropriate reduction in the contract sum, or, if the amount is determined after final payment, it shall be paid by the Contractor.

E. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2. Solid surface material shall be installed in common areas, reception, break room, mail and copy rooms.

1. Manufacturers: Subject to compliance with requirements, provide products by the following: Corian.

2. Colors and Patterns:

a. Corian “Clamshell”

C. Grommets for Cable Passage through Countertops: 2-inch OD, white, molded-plastic grommets and matching plastic caps with slot for wire passage.

1. Product: Subject to compliance with requirements, provide "EDP series with flip top" by Doug Mockett & Company, Inc.

2.02 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

C. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

2.03 FABRICATION, GENERAL

A. Fabricate woodwork to dimensions, profiles, and details indicated.

2.04 SOLID-SURFACING-MATERIAL COUNTERTOPS

A. Fabricate tops in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

1. Product: See finishes specs on plans.

2. Fabricate tops with shop-applied edges of materials and configuration indicated.
Fabricate tops with loose backsplashes for field application.

B. Drill holes in countertops for utilities as directed and supply escutcheon covers.

PART 3 - EXECUTION

3.01 PREPARATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.02 INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. 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 sag, bow, or other variation from a straight line.
2. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
3. Caulk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."

3.03 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

END OF SECTION 06 41 10

SECTION 06 82 00 –FIBERGLASS REINFORCED PLASTIC PANELS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes: Wall panels composed of fiberglass reinforced plastic (FRP) as wainscots.

B. Related Sections:

1. DIVISION 6 – Finish Carpentry
2. DIVISION 9 – Gypsum Board

1.03 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

1.04 SYSTEM DESCRIPTION

A. Performance Requirements: Provide fiberglass reinforced plastic (FRP) panels which have been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.05 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division Submittal Procedures Section.

B. Product Data: Submit manufacturer’s product data and installation instructions.

C. Samples: Submit selection and verification samples for finishes, colors and textures. Submit 2 samples of each type of panel, trim and fastener.

D. Quality Assurance/Control Submittals: Submit the following:

1. Manufacturer’s Instructions: Manufacturer’s installation instructions.

E. Closeout Submittals: Submit the following:

1. Operations and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation

Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

2. Warranty documents specified herein.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

B. Preinstallation Meeting.

1.07 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.

1. Store panels indoors.
2. Lay panels flat. Do not stand panels on edge.
3. Protect panels from moisture.
4. Do not store panels in contact with the floor or against an outside wall.
5. Maintain optimum storage conditions of 75 degrees F (24 degrees C) at 45 - 55% relative humidity.

C. Handling: Remove foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

1.08 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation and residual moisture from plaster, concrete or terrazzo work has dissipated.
2. Install panels between 60 - 75 degrees F and relative humidity below 65%, ideally at the same conditions as the room's normal operating temperatures after building is occupied.
3. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.09 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

1. Warranty Period: 5 years commencing on Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 FIBERGLASS REINFORCED PLASTIC PANELS WITH HIGH PRESSURE LAMINATES

A. Manufacturer: Kemlite Company, Inc. or equal.

B. Products/Systems: FRP panels, including the following:

1. Marlite: Smooth

a. Wall Color: S 490N LIGHT GREY.

2.02 ACCESSORIES

A. Adhesive:

1. Provide panel adhesive as recommended by panel manufacturer.

B. Trim and Seam Treatment:

1. Manufacturer: Acceptable to panel manufacturer.
2. Material: PVC moldings.

PART 3 - EXECUTION

3.01 MANUFACTURER’S INSTRUCTIONS

A. Comply with the instructions and recommendations of the FRP panel manufacturer.

3.02 EXAMINATION

A. Site Verification of Conditions:

1. Verify that site conditions are acceptable for installation of FRP panels.
2. Examine back-up surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails are countersunk and joints and cracks are filled flush and smooth with the adjoining surface.
3. Do not proceed with installation of FRP panels until unacceptable conditions are corrected.

3.03 PREPARATION

A. General:

1. Prior to installing panels, remove packaging and allow panels to acclimate to room temperature and humidity for at least 48 hours.
2. Wall substrate must be dry and free from dirt, dust, grease and other contaminants.
3. Walls must be flat and even. Remove high spots and fill low spots with material acceptable to panel manufacturer.
4. Remove foreign matter that might interfere with proper adhesive bond.

3.04 INSTALLATION

A. Fiberglass Reinforced Panel (FRP) Installation:

1. Cut panels according to manufacturer's recommendations.
2. Install panels with manufacturer's recommended gap for panel field and corner joints.
3. For walls less than 10' wide, no vertical joints are allowed.
4. Architect to approve of joint layout. Use 12' long panels for long walls.
5. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.
6. Use products acceptable to panel manufacturer and install FRP system in accordance with panel manufacturer's recommendations.

B. Joint Seam Treatment: Install panels using the following method:

1. PVC moldings.

C. Installation Using Molding:

1. Install one piece of inside corner molding.
2. Apply adhesive directly to back of FRP panel with 100% adhesive coverage using crosshatch pattern. Extend adhesive to all edges of panel.
3. Slide panel into molding and withdraw 1/8 inch to provide appropriate gap. Align with plumb line.
4. Apply adhesive directly to back of FRP panel with100% adhesive coverage using crosshatch pattern. Extend adhesive to all edges of panel.
5. Begin in top corner nearest molding with laminate roller, rolling down and out toward the edge without molding.
6. Continue rolling down and out working across panel away from previously installed panel or initial molding. Remove all trapped air.
7. Immediately remove all adhesive residue. To remove, clean with nonabrasive cotton cloth and warm water. If necessary, use a mild nonabrasive detergent. For cleanup with solvent based adhesives, use mineral spirits or acetone to remove residue.

3.05 CLEANING

A. Clean panel surfaces in compliance with manufacturer's recommendations.

1. Use a clean, damp, nonabrasive cotton cloth and a mild liquid detergent or household cleaner.
2. Rinse with clean water using a clean, nonabrasive cotton cloth.
3. Dry panels with a soft, clean nonabrasive cotton cloth.
4. Do not use cleaners containing acid, alkali or sodium hypochlorite.

3.06 PROTECTION

A. Protect installed work from damage due to subsequent construction activity on the site.

END OF SECTION 06 82 00

SECTION 07 17 16 - BENTONITE COMPOSITE SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Work for this Section includes:

1. Provide below-grade bentonite geotextile waterproofing system, including all accessory products.

B. Provide all permits, labor, materials, temporary protection, means to access the work, etc. as required to complete the Work.

C. All Work shall be performed following applicable local, state, federal codes and regulations, except where the Specifications are more stringent.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 013000, "Administrative Requirements."

2. Closeout Submittals shall be submitted in accordance with Section 017700 “Closeout Procedures” and Section 017800, “Warranties.”

1.3 ACTION SUBMITTALS

A. Shop Drawings: Provide shop drawings showing layout of details, intersection/interaction with adjacent components, etc. Shop drawings shall including section and isometric details as required to completely show the required detailing.

B. Samples of each product and accessory submitted for approval.

1.4 INFORMATIONAL SUBMITTALS

A. Materials: Provide a list of materials; including all fasteners (if applicable) intended for use on the project and location of use.

B. Product Data: For each material and component indicated and required, provide product data including test certification, installation instructions, limitations, etc.

C. Material Testing Reports: Provide material test reports from a third-party testing agency, confirming that the materials meet the required standards. Provide material test reports for the following materials:

1. Bentonite Composite sheet waterproofing.

2. Self-Adhering sheet membrane waterproofing.

D. Installer Certification: Signed by material manufacturer, certifying that the Installer complies with requirements.

E. Manufacturer Certificates: Signed by manufacturer certifying that materials, substrates, etc. specified for the Project comply with requirements.

F. Sample Warranty: Copy of material manufacturer's warranty, stating obligations, remedies, limitations, and exclusions.

G. Manufacturer's written instructions for recommended maintenance practices and schedule.

1.5 CLOSEOUT SUBMITTALS

A. Following completion of Work, submit completed material manufacturer's warranty.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications:

1. Qualified firm that is approved, authorized, or licensed by the material manufacturer(s) to install the required system and that is eligible to receive required manufacturer's warranty.

2. Installation experience of the specified materials, with similar complexities of this project, in the local area which have been installed for a minimum of five (5) years.

3. Employ foreman trained by the material manufacturer and with minimum of five (5) years' experience as foreman on similar projects, who is fluent in English, to be on-site at all times during Work.

4. Must use trained workers.

B. Manufacturer Qualifications:

1. The system manufacturer will be a company with at least ten (10) years documented experience with the manufacturing of the systems specified.

2. Waterproofing and all accessory products shall be provided by a single manufacturer with a minimum of 30 years documented experience in the direct production and sales of waterproofing systems. Manufacturer shall provide field service representation during construction, approving an acceptable installer, recommending appropriate installation methods, and conducting a final inspection of the waterproofing system applied.

C. Pre-installation Meeting: Prior to installation of waterproofing and associated work; Contractor, Owner's representative, manufacturer's representative, Owner's waterproofing representative, waterproofing installer, and other appropriate installers shall meet at the Project site to coordinate related requirements and waterproofing work.

1. Contractor shall notify participants at least 5 working days before conducting meeting.

2. Review material selections and procedures to be followed in performing the work.

3. Review in detail job conditions, schedule, construction sequence, application requirements, quality of completed installation, product limitations, testing procedures and acceptance criteria.

4. Contractor shall record discussions of conference and any conflict, incompatibility, or inadequacy. Furnish a copy of record to each participant.

D. Coordinate site inspections by manufacturer's representative as determined at the pre-installation conference.

E. Coordinate with related Sections.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing and mixing with other components.

B. Store materials in original, undamaged containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by manufacturer. Protect stored materials from direct sunlight. Manufacturer's standard packaging and covering is not considered adequate weather protection.

C. Limit stored materials on structures to safe loading of structure at time materials are stored and to

avoid permanent deck deflection.

D. Handle materials to avoid damage.

E. Conspicuously mark damaged or opened containers or containers with contaminated materials and remove from site as soon as possible.

F. Remove and replace materials that cannot be applied within the stated shelf life.

1.8 PROJECT CONDITIONS

A. Verify existing dimensions and details prior to installation of materials. Notify Owner's Representative and Owner's waterproofing representative of conditions found to be different than those indicated in Contract Documents. Owner's Representative will review situation and inform Contractor and Installer of changes.

B. Comply with Owner's limitations and restrictions for site use and accessibility.

C. Environmental Limitations: Apply materials when existing and forecast weather conditions permit the materials to be installed according to the manufacturer's written instructions and warranty requirements.

1. Weather Conditions: Perform work only when existing and forecasted weather conditions are within the guidelines established by the manufacturer of the waterproofing materials. Do not apply waterproofing materials in areas of standing or active water; or over ice and snow. Although exposure to precipitation and ground water seepage typically will not adversely affect bentonite waterproofing, the contractor shall maintain site conditions to remove standing water from precipitation or ground water seepage in a timely manner. If the waterproofing is subjected to pre-hydration as a result of prolonged immersion, inspection of the material and written acceptance from the manufacturer is required prior to concrete or backfill placement.

2. Prevent waterproofing products from hydrating before material is contained with concrete, shotcrete, or backfill. When threat of rain is imminent, installed products not already contained should be covered with polyethylene sheeting to decrease the chance of hydration. After any precipitation, pump standing water off waterproofing as soon as possible and repair damaged membrane.

D. Install materials in strict accordance with safety requirements required by the material manufacturer, Material Safety Data Sheets, and local, state, federal rules and regulations.

1.9 WARRANTY

A. Manufacturer's Warranty: Upon installation completion and manufacturer acceptance of the work required by this section, the waterproofing materials' manufacturer will provide to the project Owner, a written ten (10) year warranty, covering both materials and labor.

1. Issuance of Manufacturer's Waterproofing Warranty requires the following:

a. Waterproofing System products and drainage composite products shall have been provided by a single manufacturer.

b. Installation of waterproofing products and prefabricated drainage composite by Manufacturer's Approved Applicator in full accordance with manufacturer's quality assurance program requirements.

c. Manufacturer's Warranty will cover 10 years of Materials and remaining 8 years of Labor

d. Applicator's Labor Warranty will cover the first 2 years of labor.

e. Superstop must be installed in all applicable concrete cold pour construction joints, including around applicable penetrations.

2. Manufacturer's warranty shall be independent from any other warranties made by the Contractor under requirements of the Contract Documents and may run concurrent with the other warranties.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Provide waterproofing membrane and applicable accessories as manufactured by Tremco.

1. Utility Vault: Paraseal

a. CIP/CMU applications only.

2.2 MATERIALS

A. Paraseal Composite Bentonite Waterproofing:

1. Paraseal LG 20-Mil (for Non-submerged conditions) with 150 mil bentonite face for below slab on grade, backfilled walls and blindside walls as manufactured by Tremco 3735 Green Road, Beachwood Ohio 44122 Local rep, Mr. Alan Cantarini Phone 949- 246-0733 acantarini@tremcoinc.com

Typical Physical Properties

PROPERTY	**TEST METHOD**	**NOMINAL VALUES**
Thickness, mils (mm)	ASTM D	60 (1.5)
Length (approximate, ft (m)		470 (143)
Low Temperature Brittleness, τF (τC)	ASTM D 748, Cond. B	<-107 (<-77)
Oxidative Induction Time, minutes	ASTM D 3895, 200 τC Pure 02, 1atm	>100
Water Absorbtion, % wt. change	ASTM D 570	<0.01
Moisture Vapor Transmission, g/m²day	ASTM E 96	<0.001
Dimensional Stability (each direction), %	ASTM D 1204, 100 τC. 1hr	± 2
Density, g/cm³	ASTM D 1506	0.94
Tensile Properties (each direction)	ASTM D 638, Type IV	
Strength at Break, lb/in-width (N/mm)	Dumbell, 2 ipm	243 (43)
Strength at Yield, lb/in-width (N/mm)		130 (23)
Elongation at Break, %	G.L. = 2.0 in (51mm)	700
Elongation at Yield, %	G.L. = 1.3 in (33mm)	13
Tear Resistance, lb (N)	ASTM D 1004	42 (157)
Puncture Resistance, lb (N)	ASTM D 4833	119 (530)
Carbon Black Content, %	ASTM D 1603	2.0
Carbon Black Dispersion	ASTM D 5596	cat. 1 or 2
Notched Constant Tensile Load	ASTM D 5397, Appendix	400

B. Paraseal GMLG -20mil (Gas Mitigating and Submerged Waterproofing membrane) Bentonite Geotextile Waterproofing Membrane:

1. Paraseal performance properties:

1. Puncture resistance 169 lbs. ASTM E 154
2. Tensile strength 4,000 psi ASTM D 412

3. Water vapor permeance	0.03 perms	ASTM E 96
4. Percent elongation	700 percent	ASTM D 638, Type 4
5. Resistance to hydrostatic head	231 feet	ASTM D 751
6. Warranted crack-bridging capability	1/8 inch	

2.3 ACCESSORY WATERPROOFING PRODUCTS

A. All accessory waterproofing materials shall be provided by the waterproofing manufacturer or shall have manufacturer's written approval for substitution.

B. For detailing vertical junctures and penetrations, provide Paramastic non-hydrated expandable mastic of trowelable consistency containing not less than 55 percent high swelling Wyoming sodium bentonite.

C. Provide the following fasteners as needed:

1. Case hardened steel nail with fluted shank having a minimum of 1 inch length and a minimum 1 inch diameter cap for use on green concrete and masonry substrates.

2. Powder shot steel pin having a minimum 3/4 inch diameter washer for use on hardened concrete and grouted masonry substrates.

3. Staples approved by membrane manufacturer for use according to project conditions.

D. Provide the following seam tapes as needed:

1. Permanent Seam Tape reinforced, rubberized-asphaltic waterproofing seam tape 4 inches wide by 60 mils thick for sealing backfilled wall membrane overlaps and wherever flood testing is required and elsewhere as required by project conditions or designs.

2. Para JT tape non-reinforced, adhesive tape of partially cross linked polymeric elastomers 2 inches wide x 1/8 inch thick for molding form fit seals around difficult contours and for taping seams within overlaps on the 20 mil Paraseal GM/LG System where application if in the water table and/or if in submerged conditions.

E. Provide Vulkem 116 Sealant one-part or Dymonic 100 gun grade polyurethane sealants for completing termination seals and other sealing recommended by the waterproofing manufacturer.

F. Provide Tremproof 250GC Trowel Grade elastomeric flashing polyurethane, liquid-applied, elastomeric waterproofing flashing.

G. Provide Parastick 'N Dry pressure sensitive, double-sided tape laminate of bentonite sandwiched between a netting and non-woven fabric for wrapping through-concrete embeds and other detailing.

H. Provide "Superstop" flexible, reinforced, bentonite-laminate waterstop strips 1/2 inch x 1 inch x 20 foot - 0 inch with pressure sensitive adhesive backing for sealing static cold joints in concrete.

I. Provide Paraprimer versatile adhesive bonding agent primer formulated for use with tapes and pressure sensitive waterproofing accessories.

J. Provide 100 percent Sodium Para-Granular Loose Bentonite for forming cants' at change of planes and making repairs to the waterproofing membrane per waterproofing manufacturer's details.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Comply with contract documents and manufacturer's product data, including product application and installation instructions.

B. The installer, with the Owner's waterproofing representative present, shall examine conditions of substrates and other conditions under which this section Work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work.

C. Do not proceed with work until unsatisfactory conditions are corrected and are acceptable for compliance with manufacturer's warranty requirements. General concrete substrate conditions acceptable for the waterproofing installation are listed below. For conditions not covered in this Section, contact the waterproofing manufacturer for guidance.

D. Compacted Soil or Gravel:

1. Sub-grade shall be compacted to a minimum Modified Proctor compaction of 85 percent or greater as specified by civil/geotechnical engineer.

2. The finished sub-grade surface shall be well-leveled, uniform, free of debris and standing water.

3. Aggregate sub-grades shall consist of 3/4 inch stone or smaller and rolled flat, free from any protruding sharp edges.
   a. If substrate consists of large aggregate, place a high-strength geotextile layer over the aggregate and then provide several inches of compacted soil or sand for uniform support and containment of waterproofing sheets.

4. Specific sub-grade preparation shall be approved by the project's civil or geotechnical engineer.

E. Concrete:

1. Concrete to be waterproofed shall be properly placed and consolidated.

2. Reinforced structural slabs should be a minimum of 6 inches thick when placed on a working mud slab (when applicable).

3. Reinforced concrete slab(s) on compacted grade shall be a minimum of 4 inches thick (when applicable).

4. When hydrostatic conditions exist, install waterproofing under all footings, elevator pits and grade beams or as indicated on drawings.

5. Cast-in-place concrete to receive waterproofing shall be of sound structural grade with a smooth finish, free of debris, oil, grease, laitance, dirt, dust, or other foreign matter which will impair the performance of the waterproofing and drainage system; which do not comply with manufacturer's warranty requirements.

6. Waterproofing can be installed on green structural concrete as soon as the forms are removed provided the contractor gains written approval from project structural engineer listing any site specific concrete curing time requirement.

7. Concrete to receive waterproofing shall be of sound structural grade with a smooth finish, free of debris, oil, grease, laitance, dirt, dust, or other foreign matter which will impair the performance of the waterproofing and drainage system; which do not comply with manufacturer’s warranty requirements.

8. Concrete surfaces to receive Vulkem 801 should be. Allow wet concrete to thoroughly dry prior to applying Vulkem 801.

F. Remove dirt, debris, oil, grease, cement laitance, or other foreign matter which will impair or negatively affect the performance of the waterproofing and drainage system.

G. Protect adjacent w o r k areas and finished surfaces from damage or contamination from waterproofing products during installation operations.

H. Form fins, ridges, ponding ridges and other protrusions should be level and smooth.

I. For horizontal applications, all standing water must be removed, and the surface dried.

J. Honeycombing, aggregate pockets, tie-rod holes and other voids shall be completely filled with non-shrink cementitious grout and level with monolithic concrete surface.

K. All expansion joints should receive applicable expansion joint sealant product manufactured by others prior to the installation of the Waterproofing System. Expansion joint material is the primary seal at the expansion joint and the expansion joint material manufacturer is responsible for water tightness of the joint.

L. NOTE: Superstop shall be installed in all applicable vertical and horizontal concrete construction cold pour joints and around applicable penetrations, structural members and tie-rod form holes that extend through the wall. Refer to Superstop Product Manual for further installation procedures and guidelines.

3.2 GENERAL INSTALLATION GUIDELINES

A. Install waterproofing system and accessories in accordance with the manufacturer’s written instructions and recommendations, except as modified within the Construction Documents and as required by the manufacturer to obtain the specified warranty.

B. Install flashing at all transitions, terminations, penetrations, etc., as indicated in the Contract Documents.

C. Waterstop installation:

1. Install waterstop following the manufacturer’s written recommendations.

2. Waterstop must be continuous. Abut all ends to provide continuity between sections.

3. Install waterstop a minimum of 3 inches away from the exterior face of the concrete.

4. Install waterstop in a continuous bead of sealant/adhesive.

3.3 PARASEAL (BLINSIDE) INSTALLATION

A. General:

1. Refer to Section 3.1 for Substrate Conditions and Preparation.

2. Prevent bentonite products from hydrating before material is contained with overburden or backfill. When threat of rain is imminent, installed bentonite products not already contained by overburden or backfill should have all seams sealed with seam tape and temporary pressure till allowed to dry. After rain, promptly remove any standing water off membrane.

   a. Review membrane after rain events for damage and hydration.

   b. Do not walk on wet membrane.

B. Membrane:

1. Install membrane poly side down, dark grey geotextile side up.

2. Lap adjacent sections and stagger end laps.

   a. Overlap a minimum of 4 inches.

   b. Stagger sheet end seams a minimum of 24 inches.

   c. Seams at joints and corners are not permitted.

3. Mechanically fasten or staple the waterproofing membrane as required to prevent movement from construction operations and/or concrete placement.

C. At vertical installation: Use termination bars, fastening from one end and working toward the other end. Cut termination bars at corners; do not wrap termination bars around corners. Apply grade termination sealant as indicated in the Drawings.

1. Fasten at 12 inches on center and within 6 inches of a corner.

2. Apply trowel grade bentonite over termination bar and along top edge.

D. Wall Penetrations: For all pipe, rebar, structural or other penetrations install waterproofing system in accordance with manufacturer's standard detail for specific project condition(s) or contract documents, whichever is more stringent.

E. Inspect finished waterproofing installation and repair any damaged material prior to concrete slab placement.

F. If the concrete wall is poured in sections, and the waterproofing is also installed in sections, extend the waterproofing at least 24 inches beyond the end of the concrete placement to allow for

proper overlapping.

G. Protect the exposed edge from damage between concrete installations. Damage to the membrane that cannot be repaired, such as directly next to the slab edge, will require substantial repair efforts, potentially including removal of portions of the installed slab.

1. NOTE: Superstop shall be installed in all slab joints, around applicable slab penetrations and structural members. Refer to Superstop Product Manual for further installation procedures and guidelines.

H. Place protection and/or drainage course prior to backfilling.

I. Backfill per manufacturer requirements.

1. Backfill shall be placed and compacted to minimum 85 percent Modified Proctor density promptly after waterproofing has been installed.

a. Backfill should be added in 6 inch to 12 inch lifts.

2. Closely coordinate with site contractor by informing them each time a waterproofed area is ready for backfill.

3. Backfill shall consist of compactable soil or angular aggregate (3/4 inches or less) free of debris, sharp objects and stones larger than 3/4 inch (18 mm).

4. Care should be used during backfill operation to avoid damage to the waterproofing system. If damage occurs, cease backfilling and report damage.

5. Damaged waterproofing must be repaired per manufacturer's guidelines.

3.4 PARASEAL INSTALLATION

A. General:

1. Refer to Section 3.1 Substrate Conditions and Preparation.

2. Prevent bentonite products from hydrating before material is contained with overburden or backfill. When threat of rain is imminent, installed bentonite products not already contained by overburden or backfill should have all seams sealed with seam tape and temporary pressure till allowed to dry. After rain, promptly remove any standing water off membrane.

a. Review membrane after rain events for damage and hydration.

3. Membrane is not an expansion joint filler or sealant, but may be used as an expansion joint cover over properly installed expansion joint assembly placed during substrate preparation.

a. To use as a expansion joint cover:

1) Trowel 1/8 inch thick by 6 inch wide layer of Paramastic centered over expansion joint.

2) Install a 24 inch wide strip of membrane centered over the expansion joint.

3) Place main course over strip.

B. Prior to Membrane, install a continuous 3/4 inch cant of Paramastic at footing/wall joint.

C. Inside corners: Install a 3/4 inch thick continuous cant of Paramastic at all vertical and horizontal inside wall corners prior to installing membrane, then, install a 20 inch filet piece of membrane centered on corner and extending 10 inches in each direction.

D. Outside corners: Install a 20 inch filet piece of membrane centered on corner and extending 10 inches in each direction.

E. Penetrations: For all pipe, rebar, structural and other penetrations install waterproofing system in accordance with manufacturer's detail for specific project condition(s) or contract drawings, whichever is more stringent.

F. Primer: Apply A-3000 WB Adhesive by roller or spray at a rate of 250-275 sq ft/gallon and allow to dry (cure) black.

G. Membrane:

1. Starting at the base of the wall, install the first course of membrane horizontally oriented, unless otherwise specified.

a. If blindside waterproofing exists:

1) Extend over the Paramastic cant and onto the footing and over below- grade membrane a minimum of 6 inches to form a continuous waterproofing system.

2) Install seam tape along bottom membrane overlap edge.

b. All other applications:

1) Extend over Paramastic cant and onto footing a minimum of 6 inches.

2) Fasten membrane 12 inches on center and within 6 inches of corner.

2. Remaining courses can be installed either vertically or horizontally oriented. Continue waterproofing membrane installation up the wall to the finish grade elevation detail, staggering all sheet roll ends.

a. Do not allow horizontal overlap joints in the membrane to coincide with same elevation as the concrete pour lift joints.

b. Overlap all membrane edges a minimum of 2 inches and secure with a minimum 1 inch diameter washer-headed fastener at a maximum spacing of 24 inches on center.

c. Stagger membrane roll end seams a minimum 12 inches.

d. Cover all seams/laps in the waterproofing membrane with seam tape.

3. Terminate waterproofing membrane 12 inches below finished grade elevation with 1 inch washer headed fasteners maximum 12 inches on center or as indicated on

drawings.

a. Install Vulkem 801 @ 40 mils min. concrete with bottom edge overlapping membrane minimum 4 inches.

b. Complete grade termination with tooled bead of Dymonic 100 (or as indicated on drawings) along top edge of termination bar, at all penetrations through the flashing and all exposed overlap seams.

H. Inspect completed waterproofing system installation and repair any damaged material prior to backfill placement. Assure that the membrane system is not displaced during backfill placement and/or soil compaction.

I. Backfilling:

1. Backfill shall be placed and compacted to minimum 85 percent Modified Proctor density promptly after waterproofing has been installed.

   a. Backfill should be added in 6 inch to 12 inch lifts.

2. Closely coordinate with site contractor by informing them each time a waterproofed area is ready for backfill.

3. Backfill shall consist of compactable soil or angular aggregate (3/4 inches or less) free of debris, sharp objects, and stones larger than 3/4 inch (18 mm).

4. Care should be used during backfill operation to avoid damage to the waterproofing system. If damage occurs, cease backfilling and report damage.

5. Damaged waterproofing must be repaired per manufacturer's guidelines.

J. Membrane Installation Over Composite Drainage Board at Front Lagging Walls

1. Install Paraseal LG membrane with the gray, bentonite side to be in direct contact with shotcrete or concrete and over a continuous layer of Tremdrain 1000 and/or Total Drain and at a minimum of 6 inches below the top of footing.

2. On shoring walls to receive shotcrete, install membrane with a minimum 4 inch sheet edge overlaps. Tack membrane to highest point of shoring. All overlaps must be stapled per waterproofing manufacturer detail requirements in the seam areas only.

3. Verify which penetrations must be accessed after concrete placement for completion of waterproofing detail treatment and ensure that sufficient access to membrane is provided within a wood or sonotube formed boxout; verify which penetrations will not be accessed after concrete placement for completion of waterproofing detail treatment and ensure that final detailing procedures are completed prior to shotcreting/guniting; waterproof penetrations in accord with manufacturer's current procedures; contact manufacturer for procedures at project conditions not provided in installation manuals.

4. There should be minimal rebar anchorage & shotcrete wire screed pins that penetrate into the installed membrane. All penetrations through the Paraseal LG shall be made through a 3" washer of Para Stick N Dry Bentonite Tape or a piece of Superstop Waterstop or a hanger bolt assembly as detailed by the waterproofing manufacturer.

5. Prevent waterproofing products from hydrating before material is contained with concrete, shotcrete, or backfill. When threat of rain is imminent, installed products not already contained should be covered with polyethylene sheeting to decrease the chance of hydration. After any precipitation, pump standing water off waterproofing as soon as possible and repair damaged membrane.

6. Inspect finished membrane installation and repair any damaged material prior to shotcrete placement. Assure that membrane is not displaced during shotcrete placement with prior discussion with the shotcrete applicator.

7. Coordinate waterproofing details and terminations at gradeline with other trades.

8. Install the Tremdrain 1000 with the fabric side to the lagging and over the face of the front- lagged steel beams and to the top of the footing. A Universal Tee outlet will need to be placed from the Tremdrain 1000 over the top of footing a minimum of every 25 feet.

9. Install the Paraseal LG with the Bentonite side facing the applicator and over the front-lagged steel beams. Staple in the seam area only per the waterproofing manufacturer details.

10. Cut and secure to fit tightly around all tie-back heads that will remain tensioned. Then install a Paraseal LG Boot or PVC Cap over tie-back head. Prior to installing boot or cap, fill cavity of boot or cap with a 50/50 mix of mastic/water stoppage (granular bentonite). Secure flanges of boot to lagging with fasteners. Hot glue cap to tieback flange. Cut and secure an extra section of membrane around the boot or cap; installing the membrane section over the flanges and extending outward from the boot or cap a minimum 12 inch radius. Finally, detail around the base of boot or cap with 3/4 inch cant of mastic. A preformed TB-boot can be used in lieu of the above tie-back head covers listed above.

11. Cut and secure to fit tightly around all tie-back heads that will be detensioned. Then install a 24 inch diameter piece of Sonotube centered over the tie-back head. Fasten the Sonotube to the lagging on the inside of the opening only and then cover the exposed face of the Sonotube with plastic sheeting. After the Shotcrete wall is placed and the tie-back is burned off using a torch and a wet fire blanket in order to not burn the Paraseal LG system and the Sonotube is removed install a Paraseal LG Boot or Paraseal LG target sheet will be applied over burned off tie-back head. Prior to installing boot or target sheet, fill cavity of boot or target sheet with a 50/50 mix of mastic/water stoppage (granular bentonite). Secure flanges of boot to lagging with fasteners. Staple edges of target sheet to lagging. Install Superstop Waterstop around the inside perimeter of the tieback void. Finally, detail around the inside with 3/4 inch cant of mastic. Fill void completely with Shotcrete or non-shrink grout as detailed by the waterproofing membrane manufacturer.

3.5 CLEANING AND PROTECTION

A. Promptly remove all unused materials from the site, and clean wall systems, roofs, windows, door frames and other surfaces adjacent to Work area.

B. Remove temporary coverings and protection.

C. Provide protection and maintain conditions in manner acceptable to the Installer and

material manufacturer to ensure that the systems are not damaged at time of Substantial Completion.

D. Protect installed waterproofing from precipitation and ground water in accordance with manufacturer's requirements until backfilling and terminations at grade are properly completed.

E. Protect waterproofing from damage by backfilling and other causes.

F. Replace waterproofing materials damaged by precipitation and other causes before and during backfilling.

3.6 WATERPROOFING REPAIRS

A. Upon notification of suspected leakage associated with below-grade waterproofing, the Contractor shall hold a leak-issue meeting to be attended by the Contractor, applicable sub- contractors, the Architect, the Owner, and the Owner's waterproofing representative.

1. The Contractor, within five (5) business days of the leak-issue meeting, shall submit a written repair plan to the Architect.

2. The Contractor, within five (5) business days of submitting the written repair plan, will initiate waterproofing repairs in accordance with the submitted plan.

3. Repairs will be performed by the Contractor at no additional cost to the Owner.

END OF SECTION 07 17 16

SECTION 07 21 00 - THERMAL INSULATION

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. Extruded polystyrene foam-plastic board insulation.
2. Glass-fiber blanket insulation.
3. Mineral-wool board insulation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Extruded polystyrene foam-plastic board insulation.
2. Glass-fiber blanket insulation **with minimum30% recycled content.**
3. Mineral-wool blanket insulation.
4. Conform to the following:
   a. Chapters 12-13 (Standards for Insulating Material) in Title 24, Part 12, the California Referenced Standards Code,
   b. The VOC-emission limits defined in 2014 CA-CHPS criteria and listed on its High Performance Products Database.
   c. California Department of Public Health 2010 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, February 201 (also known as Specification 01350).

1.4 INFORMATIONAL SUBMITTALS

A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.

1. For blown-in or sprayed fiberglass and cellulosic-fiber loose-fill insulation, indicate initial installed thickness, settled thickness, settled R-value, installed density, coverage area, and number of bags installed.
2. Sign, date, and post the certification in a conspicuous location on Project site.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION

A. Extruded Polystyrene Board Insulation, Type IV: ASTM C578, Type IV, 25-psi minimum compressive strength; unfaced.

1. Dupont Styrofoam Square edge ST-100 or equal.
2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than 450 when tested in accordance with ASTM E84.
4. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET INSULATION

A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.

1. Johns Manville, Certainteed, Owens Corning or approved equal
2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

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B. Glass-Fiber Blanket Insulation, Kraft Faced: ASTM C665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

1. Johns Manville, Certainteed, Owens Corning or approved equal.

2.3 MINERAL-WOOL BLANKET INSULATION

A. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.
1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
2. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
3. Polyurethane Pour-In-Place Insulation: Closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84, specifically formulated for pour-in-place applications.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

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. Install insulation with manufacturer's R-value label exposed after insulation is installed.

D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. 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 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, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..
2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

C. Loose-Fill Insulation: Apply according to ASTM C1015 and manufacturer's written instructions.

1. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

3.4 INSTALATION OF EXTERIOR INSULATION

A. Exterior insulation panels shall be strictly installed according to the manufacturer’s recommendations.

3.5 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 22 00 - ROOF DECK AND INSULATION

PART 1 – GENERAL

1. RELATED DOCUMENTS

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

2. SUMMARY

A. Section includes roof insulation over the properly prepared deck substrate.

B. Related Sections:
1. Section 07 – Modified Bitumen Roofing
2. Section 07 – Sheet Metal Flashing and Trim

3. REFERENCES

A. American Society for Testing and materials (ASTM):
1. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulation.
2. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board.
3. ASTM C209 Standard Test Method for Cellulosic Fiber Insulating Board.
4. ASTM C1396 Standard Specification for Gypsum Wallboard..
5. ASTM C728 Standard Test Methods for Fire Test of Roof Coverings.
6. ASTM D5 Standard Test Method for Penetration of Bituminous Materials.
7. ASTM D36 Standard Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
8. ASTM D312 Standard Specification for Asphalt Used in Roofing.
9. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
10. ASTM D2178 Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.
11. ASTM D4601 Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
12. ASTM D5147 Standard Sampling and Testing Modified Bituminous Sheet Material.

B. Factory Mutual Research (FM):
1. Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.

E. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.

F. Warnock Hersey (WH):
1. Fire Hazard Classifications.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

H. Steel Deck Institute, St. Louis, Missouri (SDI)

I. Insulation Board, Polyisocyanurate (FS HH-I-1972)

1.1. SUBMITTALS

A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Conditions of the Contract and Division 01 Specification Sections.

B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

C. Provide a sample of each insulation type.

D. Shop Drawings
1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, tapered insulation crickets, including identification of each insulation block, sequence of installation, layout, drain locations, roof slopes, thicknesses, crickets and saddles.
2. Shop drawing shall include: Outline of roof, location of drains, a complete board layout of tapered insulation components, thickness and the average "R" value for the completed insulation system.

E. Certification
1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.
2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.2. QUALITY ASSURANCE

A. Fire Classification, ASTM E-108.

B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

C. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM 1-90.

D. Pre-installation meeting: Refer to Division 07 roofing specifications for pre-installation meeting requirements.

1.3. DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 – PRODUCTS

2.1. PRODUCTS, GENERAL

A. Refer to Division 01 Section "Common Product Requirements."

B. Basis of Design: Viking Product Group: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
   1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.
   2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
   3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
   4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2. INSULATION MATERIALS

A. Thermal Insulation Properties and Approved Insulation Boards.
   1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
      a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
      b. Thickness: 2 layers of 2.6" thick with staggered jointsfor R30 min.
      c. Attachment: Mechanically attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
      d. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1.
      e. Acceptable Products:
         1) Viking Product Group
         2) Approved Equivalent

   2. Tapered Polyisocyanurate Roof Insulation; ASTM C1289:
      a. Qualities: Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
      b. Thickness: Slope to drain
      c. Average R-Value: 30 average
      d. Tapered Slope: (Field) 1/2"
      e. Tapered Slope: (Crickets) 1"
      f. Attachment: Insulation Adhesive, Hot Asphalt Adhesive
      g. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1
      h. Acceptable Products:
         1) ENRGY 3; Johns Manville

2) EnergyGuard; GAF
3) H-Shield; Hunter
4) Approved Equivalent

3. Dens-Deck Prime Roof Board by Viking PG
   a. Qualities: Nonstructural glass mat faced, noncombustible, water-resistant treated gypsum core panel.
   b. Board Size: Four feet by Eight feet (4'x8').
   c. Thickness: (1/4") @ steep slope (metal roof panel) sections only.
   d. R-Value: .56
   e. Attachment: Mechanically attached per roofing manufacturers ASCE 7-16 wind uplift requirements.
   f. Compliances: UL, WH or FM listed under Roofing Systems.

2.3. RELATED MATERIALS

A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite or organic fiberboard, as per the approved manufacturer.
   1. Acceptable Manufacturers:
      a. The Garland Company, Inc.
      b. Celotex
      c. Johns Manville
      d. GAF
      e. Approved Equivalent

B. Protection Board: Pre-molded semi-rigid asphalt composition board one half (1/2) inch.

C. Roof Board Joint Tape: Six (6) inches wide glass fiber mat with adhesive compatible with insulation board facers.

D. Asphalt: ASTM D312, Type III Steep Asphalt.

E. Roof Deck Insulation Adhesive: Insul-Lock HR - Dual-component, high rise foam adhesive with 45% rapidly renewable material content as recommended by insulation manufacturer and approved by FM indicated ratings.
   1. Tensile Strength (ASTM D412)……250 psi
   2. Density (ASTM D1875)……..8.5 lbs./gal.
   3. Viscosity (ASTM D2556)……22,000 to 60,000 cP.
   4. 2 `Peel Strength (ASTM D903)…..17 lb/in.
   5. 3 `Flexibility (ASTM D816)……Pass @ -70°F

F. Fasteners: Corrosion resistant screw fastener as recommended by roof membrane manufacturer.
   1. Factory Mutual Tested and Approved with three (3) inches coated disc for I-90 rating, length required to penetrate metal deck one inch.
   2. Screws: Concealor #14-13 DP1 as specified per ASCE 7 calculations.

PART 3 – EXECUTION

1. EXECUTION, GENERAL

A. Comply with requirements of Division 01 Section “Common Execution Requirements.”

2. INSPECTOR OF SURFACES

A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
   1. Verify that work which penetrates roof deck has been completed.
   2. Verify that wood nailers are properly and securely installed.
   3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
   4. Do not proceed until defects are corrected.
   5. Do not apply insulation until substrate is sufficiently dry.
   6. Broom clean substrate immediately prior to application.
   7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.
   8. Verify that temporary roof has been completed.

3. INSTALLATION

A. Comply with built-up roofing manufacturer's written instructions, as submitted and reviewed by Architect during the submittal process, for installing roof insulation.

B. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

C. Install tapered insulation at crickets under area of roofing to conform to slopes indicated. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

   1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

   1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of the roof.
      a. Field: 16 screws per 4 foot by 8 foot panel (2 square feet per screw).
      b. Perimeter: 24 screws per 4 foot by 8 foot panel (1.33 square feet per screw).

c. Corners: 32 screws per 4 foot by 8 foot panel (1 square foot per screw).

2. Set each subsequent layer of insulation in insulation adhesive adhered per the roofing system manufactures recommendations.

G. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and adhere in place per manufacturers instructions. Tape joints if required by the roofing manufacturer.

H. Apply adhesive to underside and immediately bond cover board to substrate.

I. Approved base layer of insulation board shall be fully attached to the deck with an approved mechanical fastening system, (all subsequent layers are to be adhered). As a minimum, the amount of fasteners shall be in accordance with manufacturer's recommendation ASCE 7-16. Otherwise, a minimum of one fastener per two square feet shall be installed.

J. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.

K. Spacing pattern of fasteners shall be as per manufacturer's recommendations to meet the ASCE 7-16 requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.

L. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal, wood and structural concrete decks where not specified by the manufacturer. For gypsum and cement-wood fiber decks, penetration shall be determined from pull-out test results with a minimum penetration of one and one-half (1 ½) inches.

M. Gypsum and cementitious wood fiber decks: Where the roof deck is visible from the building interior, the contractor shall ensure no penetration of fasteners through underside of the deck. Any holes or spalling caused by fastener installation shall be repaired by the roofing contractor. Where the new roof system thickness exceeds an amount so that a minimum of 1 ½ of penetration cannot be achieved with an Olympic TB Fastener, or approved equivalent, then (and only then) toggle bolts may be used to secure installation to the deck.

N. Tape joints of insulation as per manufacturer's requirements.

O. Attachment with Insulation Adhesive Approved by Factory Mutual (FM).

P. Ensure all surfaces are clean, dry, free of dirt, debris, oils, loose ore embedded gravel, unadhered coatings, deteriorated membrane and other contaminants that may inhibit adhesion.

Q. Apply insulation adhesive directly to the substrate using a ribbon pattern with one quarter to one half (1/4-1/2) inch wide beads 12 inches o.c., using either the manual applicator or an automatic applicator, at a rate of one (1) gallon per one hundred (150) square feet per cartridge.

R. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.

S. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular surfaces may prevent the insulation board from making positive contact with the adhesive. Relief cuts or temporary weights may be required to ensure proper contact.

T. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.

U. Tape joints of insulation as per manufacturer's requirements.

4. CLEANING

A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

5. CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction.

END OF SECTION 07 22 00

SECTION 07 25 00 -WEATHER/AIR BARRIERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Weather/Air barrier membrane DuPont™ Tyvek® StuccoWrap®

B. Seam Tape DuPont™ Tyvek® Tape 3”

C. Weather/Air barrier membrane Flashing DuPont™ FlexWrap™ NF and DuPont™ StraightFlash™ and/or DuPont™ Flashing Tape

D. Fasteners

1.2 REFERENCES

A. ASTM International

1. ASTM C 920; Standard Specification for Elastomeric Joint Sealants
2. ASTM C 1193; Standard Guide for Use of Joint Sealants
3. ASTM D 882; Test Method for Tensile Properties of Thin Plastic Sheeting
4. ASTM D 1117; Standard Guide for Evaluating Non-woven Fabrics
5. ASTM E 84; Test Method for Surface Burning Characteristics of Building Materials
6. ASTM E 96; Test Method for Water Vapor Transmission of Materials
7. ASTM E 1677; Specification for Air Retarder Material or System for Framed Building Walls

B. AATCC – American Association of Textile Chemists & Colorists

1. Test Method 127 Water Resistance: Hydrostatic Pressure Test

C. TAPPI

1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
2. Test Method T-460; Air Resistance of Paper (Gurley Hill Method)

1.3 SUBMITTALS

A. Product Data: Submit manufacturer current technical literature for each component.

B. Samples: Weather/Air Barrier Membrane, minimum 8-1/2 inches by 11 inch.

C. Quality Assurance Submittals

1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.
2. Manufacturer Instructions: Provide manufacturer’s written installation instructions.

3. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of weather/air barrier assembly installation.

D. Closeout Submittals

1. Weather/Air Barrier Warranty: Manufacturer's executed warranty form with authorized signatures and endorsements indicating date of Substantial Completion.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Installer shall have experience with installation of DuPont ™ Tyvek® weather/air barrier assemblies under similar conditions.
2. Installation shall be in accordance with weather/air barrier manufacturer's installation guidelines and recommendations.
3. Source Limitations: Provide weather/air barrier and accessory materials produced by single manufacturer.

B. Mock-up

1. Install mock-up using approved weather/air barrier assembly including fasteners, flashing, tape and related accessories per manufacturer's current printed instructions and recommendations.

   a. Mock-up size: 10 feet by 10 feet .
   b. Mock-up Substrate: Match wall assembly construction, including window opening.

2. Contact manufacturer's designated representative prior to weather/air barrier assembly installation, to perform required mock-up visual inspection and analysis as required for warranty.

C. Pre-installation Meeting

1. Hold a pre-installation conference, two weeks prior to start of weather/air barrier installation. Attendees shall include Contractor, Architect, installer, Owner's Representative, and weather/air barrier manufacturer's designated representative.
2. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of air barrier assembly materials and components, installer's training requirements, equipment, facilities and scaffolding, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

1.5 SCHEDULING

A. Review requirements for sequencing of installation of weather/air barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.

B. Schedule installation of weather/air barrier materials and exterior cladding within four months of weather/air barrier assembly installation.

1.6 WARRANTY

A. Special Warranty

1. Weather/Air barrier manufacturer's warranty for air barrier for a period of ten years from date of Substantial Completion.
2. Approval by weather/air barrier manufacturer for warranty is required prior to assembly installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. E.I. du Pont de Nemours and Company ; 4417 Lancaster Pike, Chestnut Run Plaza 721, Wilmington, DE 19805; 1.800.44TYVEK (8-9835); http://construction.tyvek.com or approved equal.

2.2 MATERIALS

A. Basis of Design: High-performance, flash spun-bonded olefin, non-woven, non-perforated, primary weather/air barrier is based upon DuPont™ Tyvek® StuccoWrap® and related assembly components.

B. Kingspan Company: Greenguard Raindrop 3D

C. 60 minute Grade D Kraft Paper –weather resistant barrier used as outbound intervening layer only for stucco façade.

D. Performance Characteristics:

1. Air Penetration: Type 1 when tested in accordance with ASTM E 1677.
2. Water Vapor Transmission: 50 perms, when tested in accordance with ASTM E 96, Method B.
3. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127.
4. Basis Weight: 2.4 oz/yd^2, when tested in accordance with TAPPI Test Method T-410.
5. Air Infiltration Resistance: Air infiltration at >750 seconds, when tested in accordance with TAPPI Test Method T-460.
6. Tensile Strength: 33/41 lbs/in., when tested in accordance with ASTM D 822 , Method A.
7. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84 . Flame Spread: 15, Smoke Developed: 25.

2.3 ACCESSORIES

A. Seam Tape: 3” DuPont™ Tyvek® Tape as manufactured by DuPont.

B. Fasteners:

1. Steel Frame Construction DuPont™ Tyvek® Wrap Cap Screws,: 1-5/8 inch rust resistant screw with 2-inch diameter plastic cap fasteners.

2. Wood Frame Construction DuPont™ Tyvek® Wrap Caps: #4 nails with large 1-inch plastic cap fasteners
3. Masonry Construction Masonry tap-con fasteners with DuPont™ Tyvek® Wrap Caps: 2-inch diameter plastic cap fasteners.

C. Sealants
1. Provide sealants that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions.
2. Products:
   a. Dow Corning 799
   b. Sikaflex 1a
   c. OSI Quad Max

D. Adhesives:

1. Provide adhesive recommended by flashing manufacturer to assist in adhesion between substrate and flashing when necessary.
2. Products:
   a. DuPont OSI Spray Adhesive
   b. Loctite 300 spray adhesive
   c. Adhesives recommend by the weather barrier manufacturer.

E. Primers:

1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing when necessary.

2. Products:

   a. DuPont OSI Spray Adhesive
   b. Loctite 300
   c. Primers recommended by the flashing manufacturer

F. Flashing

1. DuPont™ FlexWrap™ NF: Flexible membrane flashing materials for window sill and header openings and penetrations.
2. DuPont™ StraightFlash™: Straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, z-girts etc.
3. DuPont™ Flashing Tape: Flashing Tape may be used for flanged windows or behind masonry ties, z-girts etc.
4. Thru-Wall Surface Adhered Membrane with Integrated Drip Edge: Thru-Wall flashing membrane materials for flashing at changes in direction or elevation (shelf angles, foundations, etc.) and at transitions between different assembly

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify substrate and surface conditions are in accordance with air barrier manufacturer recommended tolerances prior to installation of air barrier and accessories.

3.2 INSTALLATION - AIR BARRIER

A. Install two layers of an air/weather resistant barrier: DuPont Tyvek StuccoWrap as first layer over exterior face of exterior wall substrate in accordance with manufacturer recommendations. The second outbound layer as required by code for stucco facade, an intervening layer of paper backing complying with Federal Specifications UU-B-790a, Building Paper, Type 1, Style 2, Grade D 60 minute Kraft Paper may be used.

B. Install weather/air barrier prior to installation of windows and doors.

C. Start weather/air barrier installation at a building corner, leaving 6-12 inches of weather/air barrier extended beyond corner to overlap.

D. Install weather/air barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level

E. Sill Plate Interface: See manufacturer installation guidelines.

F. Window and Door Openings: Extend air barrier completely over openings.

G. Overlap weather/air barrier

1. Exterior corners: minimum 12 inches.
2. Seams: minimum 6 inches.

H. Weather/Air Barrier Attachment:

1. Steel or Wood Frame Construction Attach weather/air barrier to studs through exterior sheathing. Secure using weather/air barrier manufacturer recommend fasteners, space 6 -18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.

I. Apply 4 inch DuPont ™ StraightFlash™ or 4 inch DuPont ™ Flashing Tape to weather/air barrier membrane prior to the installation cladding anchors,(ie, z-girts, hat channels, brick ties).

3.3 SEAMING

A. Seal seams of weather/air barrier with 3” seam tape at all vertical and horizontal overlapping seams on the first layer of DuPont Tyvek StuccoWrap.

B. Seal any tears or cuts as recommended by weather/ air barrier manufacturer.

3.4 OPENING PREPARATION for use with non-flanged windows – all cladding types

A. Flush cut air barrier at edge of sheathing around full perimeter of opening.

B. Cut a head flap at 45-degree angle in the weather/air barrier at window head to expose 8 inches of sheathing. Temporarily secure air barrier flap away from sheathing with tape.

3.5 FLASHING for use with non-flanged windows – all cladding types

DuPont recommends the use of the 7-inch wide FlexWrap™ NF with 2 by 4 framing and 9-inch wide FlexWrap™ NF with 2 by 6 framing.

A. Cut DuPont™ FlexWrap™ NF a minimum of 12 inches longer than width of sill rough opening.

B. Cover horizontal sill by aligning DuPont™ FlexWrap™ NF edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.

C. Fan DuPont™ FlexWrap™ NF at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.

D. Apply 9-inch wide strips of DuPont™ StraightFlash™ at jambs. Align flashing with interior edge of jamb framing. Start StraightFlash™ at head of opening and lap sill flashing down to the sill.

E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.

F. Install DuPont™ FlexWrap™ NF at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.

G. Coordinate flashing with window installation.

H. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C 1193.

I. Position air barrier head flap across head flashing. Adhere using 4-inch wide DuPont™ StraightFlash™ over the 45-degree seams.

J. Tape top of window in accordance with manufacturer recommendations.

K. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

3.6 OPENING PREPARATION for use with flanged windows

A. Cut air barrier in a modified "I-cut" pattern.

1. Cut weather/ air barrier horizontally along the bottom of the header.
2. Cut weather/air barrier vertically 2/3 of the way down from top center of window opening.
3. Cut weather/air barrier diagonally from bottom of center vertical cut to the left and right corners of the opening.
4. Fold side and bottom air barrier flaps into window opening and fasten.

B. Cut a head flap at 45-degree angle in the air barrier at window head to expose 8 inches of sheathing. Temporarily secure weather/air barrier flap away from sheathing with tape.

3.7 FLASHING (for use with flanged windows)

DuPont recommends the use of the 7-inch wide DuPont™ FlexWrap™ NF with 2 by 4 framing and 9-inch wide FlexWrap™ NF with 2 by 6 framing.

A. Cut DuPont™ FlexWrap™ NF a minimum of 12 inches longer than width of sill rough opening.

B. Cover horizontal sill by aligning DuPont™ FlexWrap™ NF edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.

C. Fan DuPont™ FlexWrap™ NF at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.

D. On exterior, apply continuous bead of sealant to wall or backside of window mounting flange across jambs and head. Do not apply sealant across sill.

E. Install window according to manufacturer's instructions.

F. Apply 4-inch wide strips of DuPont™ StraightFlash™ or 4" wide DuPont™ Flashing Tape at jambs overlapping entire mounting flange. Extend jamb flashing 1-inch above top of rough opening and below bottom edge of sill flashing. See manufacturer installation guidelines.

G. Apply 4-inch wide strip of DuPont™ StraightFlash™ or 6" wide DuPont™ Flashing Tape as head flashing overlapping the mounting flange. Head flashing should extend beyond outside edges of both jamb flashings.

H. Position weather/air barrier head flap across head flashing. Adhere using 4-inch wide DuPont™ StraightFlash™ or 6" wide DuPont™ Flashing Tape over the 45-degree seams.

I. Tape head flap in accordance with manufacturer recommendations

J. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

3.8 FIELD QUALITY CONTROL

A. Notify manufacturer's designated representative to conduct required periodic observations of weather/air barrier assembly installation.

3.9 PROTECTION

A. Protect installed air barrier from damage.

END OF SECTION 07 25 00

SECTION 07 43 42 –COMPOSITE WALL PANELS

Part I - General

1.1 SECTION INCLUDES:

A. Exterior, panelized fiber cement cladding system and accessories to complete a drained and back-ventilated rainscreen.

1.2 RELATED SECTIONS

A. Section 06 - Finish Carpentry

B. Section 07 - Weather Barriers

C. Section 07 - Flashing and Sheet Metal

D. Section 07 - Joint Protection

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):

1. AAMA 509-09 – Voluntary Test and Classification Method of Drained and Back Ventilated Rain Screen Wall Cladding Systems

B. ASTM International (ASTM):

1. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

2. ASTM C 1185 - Standard Test Methods for Sampling and Testing Non-Asbestos Fiber Cement.

a. ASTM C 1186 – Standard Specification for Flat Fiber-Cement Sheets.

3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

4. ASTM E 228 - Standard Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer.

5. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

6. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

7. ASTM G 23 - Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) with and without Water for Exposure of Nonmetallic Materials, Replaced by G152 and G153.

C. Florida Building Code - Test Protocol HVHZ

1. Testing Application Standard (TAS) 201, 202, 203 – Impact Test Procedures

D. Underwriters Laboratories (UL):

1. UL 723/ASTM E-84 - Standard Test for Surface Burning Characteristics of Building

Materials.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product description, standard detail drawings relevant to the project, storage and handling requirements, and installation instructions.

B. Product Test Reports and Code Compliance: Documents demonstrating product compliance with local building code, such as test reports or Evaluation Reports from qualified, independent testing agencies.

C. Shop Drawings: Submit drawings, including plan, section, and elevation drawings, showing installation details that demonstrate product layout, dimensions, finish colors, edge/termination conditions/treatments, compression and control joints, openings, and penetrations.

D. Samples: Submit samples of each product type proposed for use.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. All fiber cement panels specified in this section must be supplied by a manufacturer with a minimum of 10 years of experience in fabricating and supplying fiber cement cladding systems.

a. Products covered under this section are to be manufactured in an ISO 9001 certified facility.

2. Provide technical and design support as needed regarding installation requirements and warranty compliance provisions.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer trained by manufacturer or representative.

C. Mock-Up Wall: Provide a mock-up wall as evaluation tool for product and installation workmanship.

D. Pre-Installation Meetings: Prior to beginning installation, conduct conference to verify and discuss substrate conditions, manufacturer's installation instructions and warranty requirements, and project requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Panels must be stored flat and kept dry before installation. A waterproof cover over panels and accessories should be used at all times prior to installation.

B. If panels are exposed to water or water vapor prior to installation, allow to completely dry before installing. Failure to do so may result in panel shrinkage at ship lap joints, and such action may void warranty.

C. Panels MUST be carried on edge. Do not carry or lift panels flat. Improper handling may cause cracking or panel damage.

D. Direct contact between the panels and the ground should be avoided at all times. It is

necessary to keep panels clean during installation process.

1.7 WARRANTY

A. Provide manufacturer's 50-year warranty against manufactured defects in fiber cement panels.

B. Provide manufacturer's 15-year warranty against manufactured defects in panel finish.

C. Warranty provides for the original purchaser. See warranty for detailed information on terms, conditions and limitations.

PART II: PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Nichiha Corporation, 18-19 Nishiki 2-chome Naka-ku, Nagoya, Aichi 460-8610, Japan or approved equal.

B. Acceptable Manufacturer's Representative: Nichiha USA, Inc., 6465 E. Johns Crossing, Suite 250, Johns Creek, GA 30097. Toll free: 1.866.424.4421, Office: 770.805.9466, Fax: 770.805.9467, www.nichiha.com.

1. Basis of Design Product: Nichiha VintageWood or equal
    a. Profile colors: Cedar
    b. Profile: 3/8" grooves running lengthwise, spaced 5-5/8" apart.
    c. Optional Accessories:
        i. Manufactured corners with 3-1/2" returns.
        ii. Aluminum trim to be painted per finish schedule.
    d. Dimensions: Nominal - 18" (h) x 10' (l);
        Actual - 455mm (h) x 3,030 mm (l).
    e. Panel Thickness: 5/8 inch (16 mm actual).
    f. Weight: 57.32 lbs. per panel.
    g. Coverage: 15 sq. ft. per panel.
    h. Factory sealed on six [6] sides.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 MATERIALS

A. Fiber cement panels manufactured from a pressed, stamped, and autoclaved mix of Portland cement, fly ash, silica, recycled rejects, and wood fiber bundles.

B. Panel surface pre-finished and machine applied.

C. Panels profiled along all four edges, such that both horizontal and vertical joints between the installed panels are ship-lapped.

D. Factory-applied sealant gasket added to top and right panel edges; all joints contain a factory

sealant.

2.3 PERFORMANCE REQUIREMENTS:

A. Fiber Cement Cladding – Must comply with ASTM C-1186, Type A requirements:

1. Linear Variation with Change in Moisture Content: 0.17% linear change.
2. Wet Flexural Strength, lower limit: 580 psi.
3. Water Tightness: No water droplets observed on any specimen.
4. Freeze-thaw: No damage or defects observed.
5. Warm Water: No evidence of cracking, delamination, swelling, or other defects observed.
6. Heat-Rain: No crazing, cracking, or other deleterious effects, surface or joint changes observed in any specimen.

B. Mean Coefficient of Linear Thermal Expansion (ASTM E-228): Max 1.0*10^-5 in./in. F.

C. Surface Burning (UL 723/ASTM E-84): Flame Spread: 0, Smoke Developed: 5.

D. Wind Load (ASTM E-330): Refer to manufacturer installation guidelines for ultimate test pressure data corresponding to framing dimensions, fastener type, and attachment clips. Project engineer(s) must determine Zone 4 and 5 design pressures based on project specifics.

1. Minimum lateral deflection: L/120.

E. Water Penetration (ASTM E-331): No water leakage observed into wall cavity.

F. Weather Resistant (ASTM G-23): No cracking, checking, crazing, erosion, or other detrimental effects observed.

G. Steady-State Heat Flux and Thermal Transmission Properties Test (ASTM C-518): thermal resistance R Value of 1.23 F.

H. Fire Resistant (ASTM E-119): The wall assembly must successfully endure 60-minute fire exposure without developing excessive unexposed surface temperature or allowing flaming on the unexposed side of the assembly.

I. Drained and Back Ventilated Rainscreen (AAMA 509-09): System must pass all component tests.

J. Florida Building Code - Test Protocol HVHZ (TAS 201, 202, 203): Passed.

2.4 INSTALLATION COMPONENTS

A. Steel Clip System:

1. Starter Track:
   a. Horizontal Panel Installations - FA 700 – 10’ (l) galvalume.
   b. Vertical Panel Installations (10’ panels only) – FA 300T – 6’6” (l) galvalume.
2. Panel Clips: JEL 777 “Ultimate Clip” (10mm rainscreen for 5/8” AWP) – 400 series

stainless steel.

3. Single Flange Sealant Backer – FHK 1017 (10mm) – 6.5' (l) fluorine coated galvalume.
4. Double Flange Sealant Backer – FH 1020 (10mm) – 10' (l) fluorine coated galvalume.
5. Corrugated Spacer – FS 1005 (5mm), FS 1010 (10mm) – 4' (l).
6. Finish Clip (optional) – JE310 (5mm)

B. Aluminum Trim: Paint as specified in finish schedule.

C. Fasteners: Corrosion resistant fasteners, such as hot-dipped galvanized screws appropriate to local building codes and practices must be used. Use Stainless Steel fasteners in high humidity and high-moisture regions. Panel manufacturer is not liable for corrosion resistance of fasteners. Do not use aluminum fasteners, staples, or fasteners that are not rated or designed for intended use. See manufacturer's instructions for appropriate fasteners for construction method used.

D. Flashing: Flash all areas specified in manufacturer's instructions. Do not use raw aluminum flashing. Flashing must be galvanized, anodized, or PVC coated.

E. Sealant: Sealant shall be polyurethane, or hybrid, and comply with ASTM C920.

PART III: EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Fiber cement panels can be installed over braced wood, steel studs and sheathing including plywood, OSB, plastic foam or fiberboard sheathing. Fiber cement panels can also be installed over Structural Insulated Panels (SIP's), Concrete Masonry Units (CMU's) and Concrete Block Structures (CBS's) with furring strips, and Pre-Engineered Metal Construction.
2. Allowable stud spacing: See manufacturer's installation instructions for details.
3. A weather resistive barrier is required when installing fiber cement panels. Use an approved weather resistive barrier (WRB) as defined by the 2012 IRC. Refer to local building codes.
4. Appropriate metal flashing should be used to prevent moisture penetration around all doors, windows, wall bottoms, material transitions and penetrations. Refer to local building codes for best practices.

B. Examine site to ensure substrate conditions are within specification for proper installation.

C. Do not begin installation until unacceptable conditions have been corrected.

D. Do not install panels or components that appear to be damaged or defective. Do not install wet panels.

3.2 INSTALLATION

A. General: Install products in accordance with the latest installation guidelines of the

manufacturer and all applicable building codes and other laws, rules, regulations and ordinances. Review all manufacturer installation, maintenance instructions, and other applicable documents before installation.

1. Consult with your local dealer or Nichiha Technical Department before installing any Nichiha fiber cement product on a building higher than 45 feet or three stories. Special installation conditions may be required.

B. Panel Cutting

1. Always cut fiber cement panels outside or in a well ventilated area. Do not cut the products in an enclosed area.
2. Always wear safety glasses and NIOSH/OSHA approved respirator whenever cutting, drilling, sawing, sanding or abrading the products. Refer to manufacturer MSDS for more information.
3. Use a dust-reducing circular saw with a diamond-tipped or carbide-tipped blade.
   a. Recommended circular saw: Makita 7-1/4" Circular Saw with Dust Collector (#5057KB).
   b. Recommended blade: Tenryu Board-Pro Plus PCD Blade (#BP-18505).
   c. Shears (electric or pneumatic) or jig saw can be used for complicated cuttings, such as service openings, curves, radii and scrollwork.
4. **Silica Dust Warning:** Fiber cement products may contain some amounts of crystalline silica, a naturally occurring, potentially hazardous mineral when airborne in dust form. Consult product MSDS or visit www.osha.gov/SLTC/silicacrystalline/index.html.

3.3 CLEANING AND MAINTENANCE

A. Review manufacturer guidelines for detailed care instructions.

END OF SECTION 07 43 42

SECTION 07 46 00 - SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Fiber-cement siding panels at parapet.

B. Related Sections include the following:
1. Division 6 - Finish Carpentry
2. Division 7 - Sheet Metal Flashing and Trim.
3. Division 7- Joint Sealants

1.3 SUBMITTALS

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

B. Samples: 12-inch sample for each siding material and finish.

1.4 QUALITY ASSURANCE

A. Source Limitations for Siding and Soffit: Obtain each type, color, texture, and pattern of siding and soffit, including related accessories, through one source from a single manufacturer.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer trained by manufacturer or representative.

C. Preliminary Installation Conference:

1. Conduct preliminary installation conference.
2. The following shall be present:
   a. General Contractor.
   b. Subcontractor/supplier.
   c. The architect or engineer.
   d. The owner.
3. Inspect and discuss condition of substrate and preparatory work performed by other trades.
4. Discuss requirements for protection of work, including restriction of traffic both during installation period and for remainder of construction period.
5. Review and establish construction schedule. Verify availability of materials, installer's personnel, and equipment required to execute the work without delays.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry, well-ventilated, weathertight place.

1.5 PROJECT CONDITIONS

A. Weather Limitations: Proceed with siding installation only if substrate is completely dry and if existing and forecasted weather conditions permit siding to be installed according to manufacturer's written instructions.

1.6 SEQUENCING

A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace siding that does not comply with requirements or that fails within specified warranty period. Failures include, but are not limited to, cracking, deforming, or otherwise deteriorating beyond normal weathering.

PART 2 - PRODUCTS

2.1 SIDING

A. Fiber-Cement Siding: Siding made from fiber-cement board that does not contain asbestos fibers; complies with ASTM C 1186, Type A, Grade II; is classified as noncombustible when tested according to ASTM E 136; and has a flame-spread index of 25 or less when tested according to ASTM E 84.

1. Basis-of-Design Product: Plank and panel siding and panels at soffits as manufactured by James Hardie.

a. Siding: Smooth, factory primed with factory trim over joints.

2.2 ACCESSORIES

A. Siding Accessories: Provide starter strips and other items as recommended by siding manufacturer for building configuration.

B. Elastomeric Joint Sealant: Single-component urethane joint sealant complying with requirements in Division 7 Section "Joint Sealants" for Use NT (non-traffic) and for Uses M, G, A, and, as applicable to joint substrates indicated, O joint substrates. **Maximum VOC level of 30 g/L.**

C. Fasteners:

1. For fastening fiber-cement siding, use stainless steel screws.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply. Overlap joints to shed water away from direction of prevailing wind.

B. Measuring and Cutting:
1. Measure and cut boards accurately.
2. Plan installation so as to minimize butt joints and maximize use of full-length runs of siding.
3. Install with butt joints slightly gapped.
4. Butt joints shall occur only over framing.
5. Stagger butt joints between courses.

C. Installation:
1. Drive crews 90 degrees to surface to siding surface without breaking siding surface. Do not overdrive. Do not countersink.
2. Install per manufacturer’s installation instructions.

3.4 SEALANTS

A. Siding:
1. Provide additional water resistive barrier at joints.
2. Use concealed beads where practical. Do not use exposed beads of sealant except where concealed application is not possible.
3. At trim, corners and butt joints of board siding: Apply bead of sealant to substrate, then place siding on top of bead and shove-to so as to extrude sealant. After sealant has cured at least 24 hours, neatly cut away extruded sealant using a sharp tool.

3.5 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective siding materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to siding manufacturer's written instructions and maintain in a clean condition during construction.

3.6 WASTE MANAGEMENT

A. Separate and recycle waste materials in accordance with the Waste Management Plan and to the maximum extent possible.

B. Close and tightly seal all partly used adhesive containers and store protected in well-ventilated, fire-safe area at moderate temperature.

END OF SECTION 07 46 00

SECTION 07 55 00 - MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hot Applied 2-Ply Asphalt Roofing (StressPly, OptiMax, or Versiply). (2.9) (3.5)

B. Accessories. (2.19)

C. Edge Treatment and Roof Penetration Flashings. (2.20)(3.9)

1.2 RELATED SECTIONS

A. Section 05 – Steel Deck.

B. Section 07 – Roof Deck Insulation.

C. Section 07 - Sheet Metal Flashing and Trim

1.3 REFERENCES

A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

G. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

H. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.

I. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

J. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

K. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

L. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

M. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

N. Factory Mutual Research (FM): Roof Assembly Classifications.

O. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

P. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

Q. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

R. Warnock Hersey (WH): Fire Hazard Classifications.

S. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

T. ASCE 7, Minimum Design Loads for Buildings and Other Structures

U. UL - Fire Resistance Directory.

V. FM Approvals - Roof Coverings and/or RoofNav assembly database.

W. California Title 24 Energy Efficient Standards.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
   1. Factory Mutual Class A Rating.
   2. Underwriters Laboratory Class A Rating.
   3. Warnock Hersey Class A Rating.

C. Design Requirements:
   1. Uniform Wind Uplift Load Capacity
      a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
         1) Design Code: ASCE 7, Method 2 for Components and Cladding.
         2) Importance Category:
            a) III.
         3) Importance Factor of:
            a) 1.0
         4) Wind Speed: 120 mph
         5) Ultimate Pullout Value: 375 pounds per each of the fastener
         6) Exposure Category:
            a) C.
         7) Design Roof Height: 40 feet.
         8) Minimum Building Width: 75 feet.
         9) Roof Pitch:1/4 :12.

D. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

E. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

F. Roof system shall have been tested in compliance with the following codes and test requirements:

1. Cool Roof Rating Council:
   a. CRRC Directory CRRC 0700-0027
2. Underwriters Laboratories:
   a. Certification
3. Warnock Hersey
   a. ITS Directory of Listed Products
4. FM Approvals:
   a. RoofNav Website

1.5 SUBMITTALS

A. 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 instructions.

B. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

C. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.

D. CALgreen Tier 1 Submittals:
   1. Document how product exceeds the minimum of Table A5.106.11.2.2 in the California Green Building Code.

E. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials.

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

I. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147.

J. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwritters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

K. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
   1. Record minutes of the conference and provide copies to all parties present.
   2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
   3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 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 absolute limits.

1.11 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed Edge-To-Edge NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition including Garland Metal Components.
   1. Warranty Period:
      a. 30 years from date of acceptance.

B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
   1. Warranty Period:
      a. 5 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. Monterey County Representative: TomChapman Phone: 831-682-6827. Fax: 216-641-0633. Web Site: www.garlandco.com. Or approved equal.

B. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
   1. Bidder will not be allowed to change materials after the bid opening date.
   2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
   3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such

changes as may be required for work to be completed in all respects.
d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.

4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

2.2 HOT APPLIED 2-PLY ASPHALT ROOFING - STRESSPLY, OPTIMAX, OR VERSIPLY

A. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. StressBase 120:

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive.
1. StressPly E (Environmental):

C. Interply Adhesive: (1 and 2)
1. Generic Type III Asphalt:

D. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
1. VersiPly 40:

E. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
1. StressPly E FR Mineral (Environmental):

F. Surfacing:
1. Aggregate/Flood Coat
a. White-Star with All-Knight Primer: Lucas Fire Star A-1 Grit

2.3 ACCESSORIES:

A. Roof Insulation: In accordance with Section 07220.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Pre-Manufactured Edge Metal: R-Mer Edge Snap-On Fascia Cover and Splice Plate.
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24 gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
2. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .032" nom. or .040" nom. or .050" nom. or .063" nom.

B. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

C. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the

membrane manufacturer.

D. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

E. Drain Flashings should be 30” x 30” Sheet Zink formed and rolled.

F. Plumbing stacks should be Zinkjak formed and rolled, as recommended by manufacturer.

G. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
   1. Tensile Strength, ASTM D 412: 400 psi
   2. Elongation, ASTM D 412: 300%
   3. Density @77 deg. F 8.5 lb/gal typical

H. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
   1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

I. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
   1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
   1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
   3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
   4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
   5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
   6. Fasteners and plates for fastening components mechanically to the substrate shall

provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.

7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Metal Deck: Metal deck shall be installed as specified in Section

1. Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
2. Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
3. Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
4. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:

1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION HOT APPLIED ROOF SYSTEM

A. Base/Felt Ply(s): Install base sheet or felt plies in twenty five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.

1. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
2. Install base flashing ply to all perimeter and projection details after membrane application.

3. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
4. Install base flashing ply to all perimeter and projection details.
5. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (11-13kg) per 100 square feet.
1. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
2. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.
3. Install subsequent rolls of modified membrane as above with a minimum of 4 inch (101 mm) side laps and 8 inch (203 mm) end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
4. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
5. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and surfaces to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified hot material unless otherwise noted in these specifications. Nail off at a minimum of 8 inches (203 mm) o.c. from the

finished roof at all vertical surfaces.
4. Solidly adhere the entire sheet of flashing membrane to the substrate.
5. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and mesh.
6. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

H. Flood Coat/Aggregate:
1. Install after cap sheets and modified flashing, tests, repairs and corrective actions have been completed and approved.
2. Apply flood coat materials in the quantities recommended by the manufacturer.
3. Uniformly embed aggregate in the flood coat of cold adhesive at a rate recommended by the manufacturer.
4. Aggregate must be dry and placed in a manner required to form a compact, embedded overlay. To aid in embedment, lightly roll aggregate.

I. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

J. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Scupper Through Wall:
1. Inspect the nailer to assure proper attachment and configuration.
2. Run base ply over nailer, into scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install a scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper and allow to dry.
4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
5. Strip in flange of scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
6. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or

foam adhesive.
7. Install a second ply of thermoplastic flashing cap ply heat welded over the thermoplastic cap ply, 9 inches (228 mm) on to the field of the roof.
8. Heat weld a cover strip over all seams.

B. Scupper Through Wall (Overflow):
1. Inspect the nailer to assure proper attachment and configuration.
2. Run base ply over nailer up the overflow, into the scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper and allow to dry.
4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
5. Strip in flange scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
6. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
7. Install a second ply of thermoplastic flashing cap ply heat welded over the thermoplastic cap ply, 9 inches (228 mm) on to the field of the roof.
8. Heat weld a cover strip over all seams.

C. Coping Cap:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering entire wall and wrapped over top of wall and down face with 6 inches (152 mm) on to the base field ply and set in bitumen. Nail base flashing ply at 8 inches (203 mm) o.c. on the back side of the parapet wall.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install a second ply of thermoplastic flashing cap ply heat welded over the thermoplastic cap field ply, 9 inches (228 mm) on to the field of the roof.
6. Heat weld a cover strip over all seams.
7. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
8. Install new metal coping cap hooked to continuous cleat.
9. Fasten inside cap 24 inches (609 mm) o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.

D. Reglet Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches. Prime vertical wall and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
7. Cut reglet in masonry one joint above flashing.
8. Secure reglet counterflashing with expansion fasteners and caulk reglet opening.

E. Equipment Support:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical

and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering the curb set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Install pre-manufactured cover. Fasten sides at 24 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
7. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

F. Curb Detail/Air Handling Station:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering the curb set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
7. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

G. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
3. Run roof system base plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper and allow to dry.
5. Install base flashing ply (40 inch square minimum) in bitumen.
6. Install thermoplastic cap ply (48 inch square minimum) in bitumen or foam adhesive.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

H. Plumbing Stack:
1. Minimum stack height is 12 inches (609 mm).
2. Run roof base ply over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install thermoplastic cap ply in bitumen or foam adhesive.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
   1. StressBase 120: 120 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet with dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
         2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 100 lbf XD 85 lbf
         2) 50mm/min. @ 23 +/- 2 deg. C MD 444 N XD 378 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
         2) 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
   1. StressPly E (Environmental): 115 mil SBS and SIS (Styrene-Butadiene-Styrene and Styrene-Isoprene-Styrene) rubber modified roofing membrane reinforced with a dual fiberglass scrim and polyester scrim. ASTM D 6162, Type III Grade S:

a. Tensile Strength, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf/in XD 550 lbf/in
   2) 50 mm/min. @ 23 +/- 2 deg. C MD 87.5 kN/m XD 96.25 kN/m
b. Tear Strength, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 900 lbf XD 950 lbf
   2) 50 mm/min. @ 23 +/- 2 deg. C MD 4003 N XD 4226 N
c. Elongation at Maximum Tensile, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% XD 6.0%
   2) 50 mm/min. @ 23 +/- 2 deg. C MD 6.0% XD 6.0%
d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:
1. Generic Type III Asphalt: Hot Bitumen, ASTM D 312, Type III steep asphalt having the following characteristics:
   a. Softening Point 185 deg. F - 205 deg. F
   b. Flash Point 500 deg. F
   c. Penetration @ 77 deg. F 15-35 units
   d. Ductility @ 77 deg. F 2.5 cm

D. Flashing Base Ply:
1. VersiPly 40: 40 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet with dual fiberglass reinforced scrim.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 215 lbf/in XD 215 lbf/in
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 37.5 kN/m XD 37.5 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 275 lbf XD 275 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 1223 N XD 1223 N
   c. Elongation at Maximum Tensile, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.5% XD 4.5%
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.5% XD 4.5%
   d. Low Temperature Flexibility, ASTM D 5147
      1) Passes -30 deg. F (-34 deg. C). Meets or Exceeds ASTM D 4601 Type II Performance Criteria.

E. Flashing Ply Adhesive:
1. Generic Type III Asphalt: Hot Bitumen, ASTM D 312, Type III steep asphalt having the following characteristics:
   a. Softening Point 185 deg. F - 205 deg. F
   b. Flash Point 500 deg. F
   c. Penetration @ 77 deg. F 15-35 units
   d. Ductility @ 77 deg. F 2.5 cm

F. Surfacing:
1. Flood Coat/Aggregate:
   a. White-Star with All-Knight Primer: Polyurea flood coat adhesive: White Star; one-component, flexible, low odor, polyurea roof adhesive top coat.
      Performance Requirements:
      1) Non-Volatile Content ASTM D 2369 89%
      2) Density 9.85 lbs./gal.
      3) V.O.C. Less than 130 g/L
      4) Viscosity at 77 deg. F Brookfield viscometer 60 poise
      5) Flash Point ASTM D 93 120 deg. F (41 deg. C)
      6) Roofing Aggregate: ASTM D 1863
         a) Slag.

b) Pea gravel.
c) White spar.

2. Flashing Cap (Ply) Sheet:
   a. StressPly E FR Mineral (Environmental): 160 mil SBS and SIS (Styrene-Butadiene-Styrene and Styrene-Isoprene-Styrene) mineral surfaced rubber modified roofing membrane with fire retardant characteristics and reinforced with a dual fiberglass scrim and polyester scrim. ASTM D 6162, Type III Grade G
      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf/in XD 550 lbf/in
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 87.5 kN/m XD 96.25 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 900 lbf XD 950 lbf
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 4003 N XD 4226 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% XD 6.0%
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 6.0% XD 6.0%
      4) Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

END OF SECTION 07 55 00

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

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. Formed low-slope roof sheet metal fabrications.
2. Formed scupper and downspout sheet metal fabrications.
3. Formed wall sheet metal fabrications.
4. Formed equipment support flashing.

B. Related Requirements:

1. DIVISION 6 - Rough Carpentry
2. DIVISION 7 - Modified Bituminous Membrane Roofing
3. DIVISION 7 - Composite Wall Panels
4. DIVISION 7 - Roof Accessories

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.
1. Include identification of material, thickness, weight, and finish for each item and location in Project.
2. Include details for forming, including profiles, shapes, seams, and dimensions.
3. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
4. Include details of termination points and assemblies.
5. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter-flashings as applicable.
6. Include details of special conditions.
7. Include details of connections to adjoining work.

1.6 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.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent 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.

2.2 SHEET METAL FLASHING

A. Galvanized Sheet Metal

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality, mill phosphatized for field painting. Minimum thickness: 24 gauge unless otherwise indicated.

B. Stainless-steel Sheet: ASTM A 240 or ASTM A666 Type 304 dead soft, fully annealed; with smooth, flat surface.
1. Finish: 2B (bright, cold rolled).

C. UNDERLAYMENT MATERIALS

1. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

D. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

2.3 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 .

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 or manufactured item.

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 Zinc-Coated (Galvanized) or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
3. Fasteners for Zinc Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 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. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. 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.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Retain "Seams for Aluminum" Paragraph below only for aluminum sheet without painted or coated finish. If required, retain option below.

J. Do not use graphite pencils to mark metal surfaces.

K. Parapet Scuppers: Fabricate scuppers to dimensions required, 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. Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch thick.
   2. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

L. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes**, exterior flange trim**]. Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch thick.
   2. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates. Shop fabricate interior and exterior corners.
   1. Fabricate from the Following Materials:
      a. Galvanized Steel: 0.028 inch thick.

B. Copings: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on 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 thick.

C. Roof an Roof-to-Wall Transition. Shop fabricate interior and exterior corners]
   1. Galvanized Steel: 0.034 inch thick.

D. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch thick.

E. Roof-Penetration Flashing: Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch thick.
   2. Aluminum-Zinc Alloy-Coated Steel: [0.028 inch (0.71 mm)] <Insert dimension> thick.

2.6 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch-high, end dams. Fabricate from the following materials:
   1. Stainless Steel: 0.016 inch thick.

B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend4 inches beyond wall openings. Form head and sill flashing with 2-inch-high, end dams. Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch thick.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:
   1. Galvanized Steel: 0.028 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

   1. Verify compliance with requirements for installation tolerances of substrates.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

3.2 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 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.
   6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch 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.

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 however, reduce pre-tinning where pre-tinned surface would show in completed Work.

3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements 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. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate. .

C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

D. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

E. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

F. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

G. 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 over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner.

H. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with sealant and clamp flashing to pipes that penetrate roof.

3.5 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. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.6 MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch (offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.8 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 manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

SECTION 07 92 00 -JOINT SEALANTS

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:

B. This Section includes joint sealants for the following applications or other locations shown on the drawings:

1. Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:
   a. Siding and trim.
   b. Perimeter joints between materials listed above and frames of doors, windows and louvers.
   c. Other joints as specified or indicated.
2. Interior joints in the following vertical surfaces and horizontal non-traffic surfaces:
   a. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
   b. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   c. Pipe penetrations through walls.
   d. Other joints as specified or indicated.
   e. Acoustical joints as detailed and noted.
3. The sealing of joints in interior wet areas, including:
   a. Kitchens
   b. Restrooms
4. The sealing of penetrations through exterior walls and roofs by pipes, ducts, louvers and conduits.
5. The sealing of other joints indicated on drawings.

C. Related Sections:

1. DIVISION 8 – Glazing
2. DIVISION 9 - Gypsum Board
3. DIVISION 9 - Painting
4. DIVISION 9 - Acoustical Tile Ceilings
5. DIVISION 9 - Tiling

1.3 PRECONSTRUCTION TESTING

A. Provide exterior joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

D. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

1. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the VOC limits set by the South Coast Air Quality Management District, Rule 1168.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation; 895NST or 898, as application requires.
   b. Sika Corporation, Construction Products Division; SikaSil-C995.
   c. Tremco Incorporated; Spectrem 3.

B. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation; 300 SL.
   b. Tremco Incorporated; Spectrem 900 SL.

2.3 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Bostik, Inc.; Chem-Calk 600.
   b. Pecora Corporation; AC-20+.
   c. Tremco Incorporated; Tremflex 834.

2.4 PREFORMED JOINT SEALANTS

A. Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of pre-cured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.

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

a. Pecora Corporation; Sil-Span
b. Resource Conservation Technology

2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

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

a. Pecora Corporation; AIS-919.
b. USG Corporation; SHEETROCK Acoustical Sealant.

2.6 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), Type B (bi-cellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning

operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

a. Concrete.
b. Masonry.
c. Unglazed surfaces of ceramic tile.
d. Exterior finish systems.
e. Insulation.
f. Gypsum board.

3. Remove laitance and form-release agents from concrete.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. 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.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. 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.

F. Tooling of Non-sag 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.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.

5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.

2. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.

3. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

H. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 FIELD QUALITY CONTROL

A. 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.

3.5 CLEANING

A. 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.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

A. Close and tightly seal all partly used sealant containers and store protected in well-ventilated, fire-safe area at moderate temperature. Set aside for reuse by Owner or deliver to MRWMD's Last Chance Mercantile.

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

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. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 08 Door Hardware
2. Division 08 Glazing
3. Division 09 Interior & Exterior Painting and Coatings

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
10. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
11. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
12. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
13. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
14. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
15. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Smoke Control Door Assemblies: Comply with NFPA 105.

   a. Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and

frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).
3. Pioneer Industries (PI).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Exterior Doors (Energy Efficient): Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, and ANSI/SDI A250.4 for physical performance level.

1. Design: Flush panel.
2. Core Construction: Foamed in place polyurethane and steel reinforced core with no stiffener face welds.

    a. Provide 18 gauge steel vertical reinforcements 6 inches apart and welded in place. Foamed in place polyurethane core is chemically bonded to all interior surfaces. No face welding is permitted.
    b. Thermal properties to rate at a fully operable minimum U-Factor 0.374 and R-Value 2.53, including insulated door, Mercury thermal-break frame and threshold.
    c. Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.378 and R-Value 2.5, including insulated door, kerf type frame, and threshold.

3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
4. Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.

a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

2. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:

a. Curries Company (CU) – M Series.

C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with STM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:

a. Curries Company (CU) - M Series.

D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LOUVERS

A. Metal Louvers: Door manufacturer's standard metal louvers unless otherwise indicated.

1. Blade Type: Vision proof inverted V or inverted Y.
2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.7 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.8 ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 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 thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.

2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: 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.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. 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.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

    b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Three anchors per jamb up to 60 inches high.
        2) Four anchors per jamb from 60 to 90 inches high.
        3) Five anchors per jamb from 90 to 96 inches high.
        4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.10 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

   a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
   b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
   c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
   d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 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 and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08 11 13

SECTION 08 14 16 - FLUSH WOOD DOORS

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. Five-ply flush wood doors for opaque finish.

B. Related Requirements:
   1. Division 08 Door Hardware
   2. Division 08 Glazing
   3. Division 09 Interior & Exterior Painting and Coatings

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:

   1. Door core materials and construction.
   2. Door edge construction
   3. Door face type and characteristics.
   4. Door louvers.
   5. Door trim for openings.
   6. Door frame construction.
   7. Factory-machining criteria.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

   1. Door schedule indicating door and frame location, type, size, fire protection rating, glass specification and swing.
   2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
   3. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
   4. Dimensions and locations of blocking for hardware attachment.
   5. Dimensions and locations of mortises and holes for hardware.
   6. Clearances and undercuts.
   7. Meet WI Certified Compliance Standards.

1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Delamination of veneer.
b. Warping (bow, cup, or twist) more than 1/4 inch 42-by-84-inch section.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Retain one or both options in "Source Limitations" Paragraph below for wood doors that are matched with wood paneling.

A. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards."

B. Fire-Rated Wood Door Assemblies: Assemblies complying with NFPA80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with NFPA252.

2.3 SOLID-CORE FIVE-PLY FLUSH WOOD DOORS FOR OPAQUE FINISH

A. Interior Solid-Core Doors:
1. Performance Grade: ANSI/WDMA I.S. 1A Heavy Duty'
2. Faces: Any closed-grain hardwood of mill option.
a. Hardboard Faces: ANSI A135.4, Class 2 (standard).

3. Exposed Vertical and Top Edges: Any closed-grain hardwood.

a. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

4. Core for Non-Fire-Rated Doors:

a. ANSI A208.1, Grade LD-1 particleboard.

1) Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

2) Provide doors with glued-wood-stave or WDMA I.S. 10 structural-composite-lumber cores instead of particleboard cores for doors scheduled to receive exit devices.

b. WDMA I.S. 10 structural composite lumber.

1) Screw Withdrawal, Door Face: 550 lbf.
2) Screw Withdrawal, Vertical Door Edge: 475 lbf.

c. Either glued wood stave or WDMA I.S. 10 structural composite lumber.

5. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

6. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.
a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors for fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware.

2.4 LIGHT FRAMES AND LOUVERS

A. Metal Frames for Light Openings in Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; factory primed for paint finish.

2.5 FABRICATION

1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied.
1. Locate hardware to comply with DHI-WDHS-3.

2. Prepare doors for hardware and mortises.
3. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
4. Coordinate with hardware mortises metal frames, to verify dimensions and alignment before factory machining.
5. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
6. See Door Schedule for doors with glass lites

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

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

3.2 INSTALLATION

A. Hardware: For installation, see Section 08 71 00 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Job-Fitted Doors:

1. Align and fit doors in frames with uniform clearances and bevels as indicated below.

a. Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.

2. Machine doors for hardware.
3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
4. Clearances:

a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
c. Where threshold is shown or scheduled, provide1/4 inch from bottom of door to top of threshold unless otherwise indicated.

5. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

3.3 FIELD QUALITY CONTROL

A. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

B. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Wall and ceiling access doors.

B. Related Documents include the following:

1. See Mechanical and Plumbing drawings for locations and sizes of panels.

1.03 SUBMITTALS

A. Product Data: For each type of door and frame indicated. Include construction details relative to materials, individual components and profiles, finishes, and fire ratings (if required) for access doors and frames.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain doors and frames through one source from a single manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Access Doors:

a. Acudor Products, Inc.
b. J. L. Industries, Inc.
c. Larsen's Manufacturing Company.
d. Milcor Limited Partnership.

2.02 MATERIALS

A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, and surface defects; pickled and oiled; with minimum thickness indicated representing specified nominal thickness according to ASTM A 568/A 568M.

B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified nominal thickness according to ASTM A 568/A 568M. Electrolytic zinc-coated steel sheet, complying with ASTM A 591/A 591M, Class C coating, may be substituted at fabricator's option.

C. Drywall Beads: Edge trim formed from 0.0299-inch zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

2.03 PAINT

A. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

2.04 ACCESS DOORS AND FRAMES

A. Flush Access Doors and Trimless Frames: Fabricated from steel sheet.

1. Locations: Gypsum board ceiling surfaces and on drywall walls.
2. Door: Minimum 0.060-inch-thick sheet metal, set flush with surrounding finish surfaces.
3. Frame: Minimum 0.060-inch-thick sheet metal with drywall bead.
4. Hinges: Continuous piano hinge.
5. Latch: Key-operated latch.

2.05 FABRICATION

A. General: Provide access door 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. Steel Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

1. For trimless frames with drywall bead for installation in gypsum board assembly, provide edge trim for gypsum board securely attached to perimeter of frames.
2. Provide mounting holes in frames to attach frames to metal or wood framing in plaster and drywall construction and to attach masonry anchors in masonry construction.

D. Lock Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.06 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.

2.07 STEEL FINISHES

A. Surface Preparation: 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:

B. Apply shop primer to uncoated surfaces of metal fabrications. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

PART 3 - EXECUTION

3.01 PREPARATION

A. Advise installers of other work about specific requirements relating to access door and floor door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

3.02 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

C. Install access doors with trimless frames flush with adjacent finish surfaces or recessed to receive finish material.

3.03 ADJUSTING AND CLEANING

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 08 31 13

SECTION 08 41 10 - ALUMINUM-FRAMED ENTRANCES AND WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Exterior aluminum-framed storefronts and window systems.

   a. Glazing is retained mechanically with gaskets on four sides.

2. Exterior manual-swing and power-assisted swing aluminum doors

3. Window Sun Shades.

B. Related Sections include the following:
1. Division 09 Joint Sealants
2. Division 08 Door Hardware
3. Division 08 Glazing.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:

1. Structural loads.
2. Thermal movements.
3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
4. Dimensional tolerances of building frame and other adjacent construction.
5. Failure includes the following:

   a. Deflection exceeding specified limits.
   b. Thermal stresses transferred to building structure.
   c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
   d. Noise or vibration created by wind and thermal and structural movements.
   e. Loosening or weakening of fasteners, attachments, and other components.
   f. Sealant failure.
   g. Failure of operating units to function properly.

B. Structural Loads:

1. Wind Loads: As required by local codes.

2. Seismic Loads: As required by local codes.

C. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

D. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and 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.

E. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation 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.

F. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft.

G. Water Penetration Under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of [20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

H. Water Penetration Under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to [20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

I. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.

1.4 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.

B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.

1. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
2. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
3. Provide for door security hardware.

C. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.

D. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.

1. Engineering Responsibility: Preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.

B. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

C. Accessible Entrances: Comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)" and 1.2001 CSBC.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems 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 aluminum-framed systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

A. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.

1. Warranty Period: **10** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: The design for aluminum-framed systems is based on Subject to compliance with requirements, provide the named product or a comparable product:
   1. Kawneer or approved equal.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

   1. Sheet and Plate: ASTM B 209.
   2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
   3. Extruded Structural Pipe and Tubes: ASTM B 429.
   4. Structural Profiles: ASTM B 308.

B. Steel Reinforcement: With manufacturer's standard 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.

   1. Structural Shapes, Plates, and Bars: ASTM A 36.
   2. Cold-Rolled Sheet and Strip: ASTM A 1008.
   3. Hot-Rolled Sheet and Strip: ASTM A 1011.

2.3 FRAMING SYSTEMS

A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.

   1. Kawneer: Trifab II **451**, 1 ¾" x 4 ", for double glazing; no thermal break required.

B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

   1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
   2. Reinforce members as required to receive fastener threads.

D. Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed flashing from sheet aluminum finished to match framing and of sufficient thickness to maintain a flat appearance without visible deflection.

E. Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type and SSG/Weatherseal option.

1. Interior and exterior system to provide insulated glass.

F. Sub-sills required at exterior units.

G. Sun Shade – Add frame reinforcement, head anchor for shear block assembly with attached sun shades.

2.4 WINDOW SUN SHADES

A. Versoleil SunShade – Outrigger/Single Blade System:
1. Aluminum sunshade that consists of outriggers, louvers and fascia.
2. Anchored directly to the vertical curtain wall mullions.
3. Anchors shall be painted to match window framing.
4. Louvers and fascia anodized and match the curtain wall framing finish.

2.5 GLAZING SYSTEMS

A. Glazing: As specified in Division 8 Section "Glazing."

B. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

2.6 DOORS

A. Doors: Manufacturer's standard glazed doors, for manual swing operation.

1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie rods.

2. Door Design:

a. Exterior Doors: Kawneer 350 Swing Door: medium style.
b. Accessible Doors: Smooth surfaced for width of door in area within 10 inches above floor or ground plane.

3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.

a. Provide non-removable glazing stops on outside of door.

2.7 DOOR HARDWARE

A. General: Provide and install heavy-duty units in sizes and types recommended by entrance system and hardware manufacturers for entrances and uses indicated.

1. Named Products: Provide Hardware Groups listed in the Door Hardware Schedule at the end of Section 08 71 00, and on the Door Schedule in the drawings.

    a. Provide named hardware to be provided by door manufacturer.

    b. Provide doors and frames prepared for security system, and access control and assisted operating systems.

B. Weather Stripping: Manufacturer's standard replaceable components.

1. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

C. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

D. Thresholds: Raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch. Threshold to be wall width plus 2". Miter ends minimum 3" beyond door edge.

2.8 ACCESSORY MATERIALS

A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 7 Section "Joint Sealants."

B. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.9 FABRICATION

A. Form aluminum shapes before finishing.

B. Framing Members, General: 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. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
4. Physical and thermal isolation of glazing from framing members.
5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
6. Provisions for field replacement of glazing from interior.
7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

C. Mechanically Glazed Framing Members: Fabricate for flush glazing (without projecting stops).

D. Doors: Reinforce doors as required for installing hardware.

1. At pairs of exterior doors, provide sliding weather stripping retained in adjustable strip mortised into door edge.

2. At exterior doors, provide weather sweeps applied to door bottoms.

E. Hardware Installation: Factory install hardware to the greatest extent possible. Cut, drill, and tap for factory-installed hardware before applying finishes.

F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.10 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

1. Color and Gloss: Match Curtain Wall finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

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

3.2 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 non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight, unless otherwise indicated.
7. Provide for installation of security door hardware.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, without warp or rack.

F. Install glazing as specified in Division 8 Section "Glazing."

G. Entrances: Install to produce smooth operation and tight fit at contact points.

1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

H. Install perimeter joint sealants as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.

I. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:

1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
2. Alignment:

a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.

3. Diagonal Measurements: Limit difference between diagonal measurement to 1/8 inch.

3.3 ADJUSTING

A. Entrances: Adjust operating hardware for smooth operation according to hardware manufacturers' written instructions.

1. For doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch measured to the leading door edge.

END OF SECTION 08 41 10

SECTION 08 44 13: GLAZED ALUMINUM CURTAIN WALLS

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 covers Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.

B. Related Sections:

1. Division 7 Joint Sealants
2. Division 7 Weather Barriers
3. Division 8 Glazing

1.3 DEFINITIONS

A. For fenestration industry standard terminology and definitions, refer to the American Architectural Manufacturers Association Glossary (AAMA AG-13).

1.4 PERFORMANCE REQUIREMENTS

A. General Performance:

1. Product to comply with the specified performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction, as determined by testing of glazed aluminum curtain walls representing those indicated for this project.
2. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
3. Failure includes any of these events:
   a. Thermal stresses transferring to building structure
   b. Glass breakage
   c. Loosening or weakening of fasteners, attachments, and other components
   d. Failure of operating units

B. Delegated Design:

1. Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Wind Loads:

1. The curtain wall system shall include anchorage that is capable of withstanding the following:

   Basic Wind Speed = 110 mph
   Wind Exposure "B"
   Risk Category II
   Maximum wall pressure = 19.20 psf

2. The design pressures are based on the California Building Code, 2016 Edition.

D. Air Leakage:

1. The test specimen shall be tested in accordance with ASTM E 283.

2. Air infiltration rate shall not exceed 0.06 cfm/ft^2 (0.3 l/s · m^2) at a static air pressure differential of 6.2 psf (300 Pa).

E. Water Resistance:

1. Static:

   a. The test specimen shall be tested in accordance with ASTM E 331.

   b. There shall be no leakage at a minimum static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

2. Dynamic:

   a. The test specimen shall be tested in accordance with AAMA 501.1.

   b. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

F. Uniform Load:

1. A a static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330.

2. There shall be no deflection in excess of L/175 of the span of any framing member at design load.

3. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

G. Seismic:

1. When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 x the story height and ultimate displacement (inelastic) of 1.5 x the design displacement.

H. Thermal Transmittance (U-factor), Physical Test:

1. Thermal transmittance test results in accordance with AAMA 1503 or CSA A440 are based upon 1" (25.4 mm) clear, low-emissivity coated glass insulating unit, (1/4" e=0.035, #2), 1/2" warm edge spacer and argon fill gas, 1/4").

2. When tested using AAMA 1503, the thermal transmittance (U-factor) shall not be more than 0.43 Btu/(hr·ft^2·°F).

I. Condensation Resistance Factor (CRF) or Temperature Index (TI):

1. Condensation resistance test results in accordance with AAMA 1503 or CSA A440 are based upon 1" (25.4 mm) clear insulating glass (1/4", 1/2" AS, 1/4").

2. If using CRF: When tested using AAMA 1503, the CRF_{frame} and CRF_{glass} shall not be less than 66 and 60 respectively.

3. If using TI: When tested to CSA A440-00, the TI_{frame} and TI_{glass} shall not be less than 68 and 54 respectively.

J. Sound Transmission Loss:

1. When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:

a. STC 31 or OITC 26 based upon 1" (25.4 mm) insulating glass (1/4", 1/2" AS, 1/4")

b. STC 37 or OITC 30 based upon 1" (25.4 mm) laminated glass (1/4" laminated, 1/2" AS, 1/4" laminated)

c. Section B-3.1.3 ASTM F2248 Design Approach

K. Environmental Product Declaration (EPD): Shall have a Type III Product-Specific EPD created from a Product Category Rule.

L. Material Ingredient Reporting:

1. Shall have a complete list of chemical ingredients to at least 100 ppm (0.01%) that covers 100% of the product.

2. Acceptable documentation includes:

a. Manufacturer's inventory with Chemical Abstract Service Registration Number (CASRN or CAS#):

1) Kawneer's Material Transparency Summary (MTS)

b. Cradle to Cradle certification; either document listed below is acceptable for this option:

1) Cradle to Cradle Certified™ with Material Health section Silver or higher

2) Silver Level or higher Material Health Certificate

c. Red List Free DECLARE label

1.5 SUBMITTALS

A. Product Data:

1. For each type of product indicated, include:

a. Construction details

b. Material descriptions

c. Dimensions of individual components and profiles

d. Finishes

2. Recycled Content:

a. Provide documentation that aluminum has a minimum of 50% mixed pre- and post-consumer recycled content.

b. Provide a sample document illustrating project-specific information that will be provided after product shipment.

c. After product has shipped, provide project-specific recycled content information:

1) Indicate recycled content, including the percentage of pre- and post-consumer recycled content per unit of product.

2) Indicate the relative dollar value of recycled content product to the total dollar value of product included in the project.

3) Indicate the location for recovery of recycled content.

4) Indicate the location of the manufacturing facility.

3. Environmental Product Declaration (EPD):

a. Include a Type III Product-Specific EPD created from a Product Category Rule.

B. Shop Drawings:

1. Plans

2. Elevations

3. Sections

4. Full-size details

5. Attachments to other work

C. Samples for Initial Selection:

1. Provide samples for units with factory-applied color finishes.

D. Samples for Verification:

1. Provide a verification sample for each type of exposed finish required, in manufacturer's standard sizes.

E. Product Test Reports:

1. Provide test reports for glazed aluminum curtain walls.

2. Test reports must be based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency.

3. Test reports must indicate compliance with performance requirements.

F. Fabrication Sample:

1. Provide a fabrication sample of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:

a. Joinery

b. Glazing

1.6 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer must have successfully installed the same or similar systems required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications:

1. Manufacturer must be capable of fabricating glazed aluminum curtain walls that meet or exceed the stated performance requirements.

C. Source Limitations:

1. Obtain aluminum curtain wall system through one source from a single manufacturer.

D. Product Options:

1. Information on drawings and in specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

2. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

E. Mockups:

1. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

2. Build mockups for the type(s) of curtain wall elevation(s) indicated, in location(s) shown on drawings.

F. Pre-installation Conference:

1. Conduct conference at project site to comply with requirements in Division 01 Project Management and Coordination Section.

1.7 PROJECT CONDITIONS

A. Field Measurements:

1. Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication.

2. Indicate measurements on shop drawings.

1.8 WARRANTY

A. Submit manufacturer's standard warranty for owner's acceptance.

B. Warranty Period:

1. Two years from Date of Substantial Completion of the project provided however that in no event shall the Limited Warranty begin later than six months from date of shipment by manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product:

1. Kawneer Company, Inc. or approved equal.

2. 1600 Wall System®1 Curtain Wall types:

a. 1600 Wall System®1 Curtain Wall:

1) Sight line: 2-1/2" (63.5 mm)

2) Outside-glazed pressure plate format

3) System depth: 6" (152.4 mm) and 1" (25.4 mm) insulating glazing

3. Tested to AAMA 501, ASTM E 1886, E 1996, and TAS 201, 202, 203

B. Substitutions:

1. Refer to Division 01 Substitutions Section for procedures and submission requirements.

2. Pre-Contract (Bidding Period) Substitutions:

a. Submit written requests ten (10) days prior to bid date.

3. Post-Contract (Construction Period) Substitutions:

a. Submit written request in order to avoid installation and construction delays.

4. Product Literature and Drawings:

a. Submit product literature and drawings modified to suit specific project requirements and job conditions.

5. Certificates:

a. Submit certificate(s) certifying that the substitute manufacturer (1) attests to adherence to specification requirements for curtain wall system performance criteria, and (2) has been engaged in the design, manufacture, and fabrication of aluminum curtain walls for a period of not less than ten (10) years. (*Company Name*).

6. Test Reports:

a. Submit test reports verifying compliance with each test requirement required by the project.

7. Samples:

a. Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

C. Substitution Acceptance:

1. Acceptance will be in written form, either as an addendum or modification.

2. Acceptance will be documented by a formal change order signed by the owner and contractor.

2.2 MATERIALS

A. Aluminum Extrusions:

1. Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish

2. Not less than 0.070" wall thickness at any location for the main frame

3. Complying with ASTM B221: 6063-T6 alloy and temper

4. Recycled Content:

   a. Shall have a minimum of 50% mixed pre- and post-consumer recycled content.

   b. Indicate recycled content, including the percentage of pre- and post-consumer recycled content per unit of product.

   c. Indicate the relative dollar value of recycled content product to the total dollar value of product included in the project.

   d. Indicate the location for recovery of recycled content.

   e. Indicate the location of the manufacturing facility.

B. Aluminum Sheet Alloy:

1. Shall meet the requirements of ASTM B209.

C. Fasteners:

1. Aluminum, nonmagnetic stainless steel or other materials must be non-corrosive and compatible with aluminum members, trim hardware, anchors, and other components.

D. Anchors, Clips, and Accessories:

1. Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating.

2. Anchors, clips, and accessories shall provide sufficient strength to withstand the design pressure indicated.

E. Pressure Plate:

1. Pressure plate shall be aluminum.

2. Pressure plate shall be fastened to the mullion with stainless steel screws.

F. Reinforcing Members:

1. Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating.

2. Reinforcing members must provide sufficient strength to withstand the design pressure indicated.

G. Sealant:

1. For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

H. Thermal Barrier:

1. Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3 mm) separation.

I. Tolerances:

1. References to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2. Product does not contain PVC or Neoprene.

2.3 CURTAIN WALL FRAMING

A. Framing Members:

1. Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads

2. Glazing System: Four-sided captured

3. Glazing Plane: Front

B. Glass:

1. Insulating glass options:

a. 1" (25.4 mm)

C. Brackets and Reinforcements:

1. Manufacturer's standard high-strength aluminum with non-staining, non-ferrous shims for aligning system components.

D. Framing Sealants:

1. Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.

E. Fasteners and Accessories:

1. Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories must be compatible with adjacent materials.

2. Where exposed, fasteners and accessories shall be stainless steel.

F. Perimeter Anchors:

1. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

G. Packing, Shipping, Handling, and Unloading:

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

H. Storage and Protection:

1. Store materials so that they are protected from exposure to harmful weather conditions.

2. Handle material and components to avoid damage.

3. Protect material against damage from elements, construction activities, and other hazards before, during, and after installation.

2.4 GLAZING

A. Glazing to meet requirements in Division 08 Glazing Section.

B. Available Glazing Options:

1. 1600 Wall System®1 Curtain Wall:

a. System depth: 6" for 1" insulating glazing.

C. Glazing Gaskets:

1. Gaskets to meet requirements of ASTM C864.

D. Spacers and Setting Blocks:

1. Manufacturer's standard elastomeric type

E. Bond-Breaker Tape:

1. Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

F. Glazing Sealants:

1. As recommended by manufacturer for joint type.

2.5 ACCESSORY MATERIALS

A. Bituminous Paint:

1. Cold-applied asphalt-mastic paint

2. Complies with SSPC-Paint 12 requirements except containing no asbestos

3. Formulated for 30-mil (0.762 mm) thickness per coat

B. Versoleil® SunShade - Outrigger/Single Blade System:

1. Aluminum sunshade that consists of outriggers, louvers, and fascia.

2. Anchored directly to the vertical curtain wall mullions.

3. Anchors shall be painted to match window framing.

4. Louvers and fascia anodized and match the curtain wall framing finish

2.6 FABRICATION

A. Extrude or form aluminum shapes before finishing.

B. 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

3. Physical and thermal isolation of glazing from framing members

4. Accommodations for thermal and mechanical movements of glazing and framing that maintain required glazing edge clearances

5. Provisions for field replacement of glazing from exterior

6. Fasteners, anchors, and connection devices that are concealed from view to the greatest extent possible

7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior

C. Curtain Wall Framing:

1. Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.

D. After fabrication, clearly mark components to identify their locations in project according to shop drawings.

2.7 ALUMINUM FINISHES

A. Finish designations that are prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing:

1. Kawneer Permanodic® AA-M10C21A41 / AA-M45C22A41, AAMA 611, Architectural Class I Clear Anodic Coating Color #14 Clear)

PART 3 EXECUTION

3.1 EXAMINATION

A. With installer present, examine areas for compliance with requirements for installation tolerances and other conditions affecting performance of the work.

B. Proceed with installation only after correcting unsatisfactory conditions.

3.2 INSTALLATION

A. Curtain Wall System Installation:

1. Install curtain wall systems plumb, level, and true to line, without warp or rack of frames, within manufacturer's prescribed tolerances, and complying with installation instructions.

2. Provide support and anchor in place.

3. Dissimilar Materials:

   a. Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

4. Glazing:

   a. Glass shall be outside-glazed.

   b. Glass shall be held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners that are spaced no more than 9" (228.6 mm) on center.

5. Water Drainage

   a. Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations.

   b. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

B. Related Products Installation:

1. Sealants (Perimeter):

   a. Refer to Joint Treatment (Sealants) Section.

2. Glass:

   a. Refer to Glass and Glazing Section.

   b. Reference: ANSI Z97.1, CPSC 16 CFR 1201, and GANA Glazing Manual.

3.3 FIELD QUALITY CONTROL

A. Field Tests:

1. Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter-caulked, and cured.

2. Conduct tests for air infiltration and water penetration with manufacturer's representative present.

3. Tests that do not meet the specified performance requirements and units that have deficiencies shall be corrected as part of the contract amount.

4. Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.

5. Air Infiltration Tests:

   a. Conduct tests in accordance with ASTM E 783.

   b. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft^2, whichever is greater.

6. Water Infiltration Tests:

   a. Conduct tests in accordance with ASTM E 1105.

   b. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).

B. Manufacturer's Field Services:

1. Upon owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjusting: Not applicable.

B. Protection:

1. Protect installed product's finish surfaces from damage during construction.

2. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

C. Cleaning:

1. Repair or replace damaged installed products.

2. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

3. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during the construction period.

4. Remove construction debris from project site and legally dispose of debris.

END OF SECTION 08 44 13

SECTION 08 51 13 - ALUMINUM WINDOWS **(Bid Alternative 5)**

PART 1 GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.1 SUMMARY

A. Section Includes: This section specifies **Series 5000 Windows by All Weather Architectural Aluminum** OR Equal windows, as indicated on the Window Schedule on the drawings.

B. Related Requirements:

1. Division 7 Joint Sealants
2. Division 8 Glazing

1.2 REFERENCES

A. Reference Standards:

1. American Architectural Manufacturer's Association (AAMA):
   a. AAMA/WDMA/CSA101/I.S.2/A440, North American Fenestration Standard/Specification for Windows, Doors, andSkylights, Includes Update No. 1.
   b. AAMA 502-12 Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
   c. AAMA 609 Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
   d. AAMA 611 Voluntary Standards for Anodized Architectural Aluminum.
   e. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic
   Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).
2. Glass Association of North America (GANA):
   a. GANA 01-0300 Proper Procedures for Cleaning Architectural Glass Products.
3. ASTM International (ASTM):
   a. ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, andDoors Under Specified Pressure Differences Across the Specimen.
   b. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Wallsby Uniform Static Air Pressure Difference.
   c. ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls byCyclic Static Air Pressure Difference.
   d. ASTM F588 Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding
   Glazing Impact.
4. National Fenestration Rating Council (NFRC):
   a. NFRC 100A Procedure for Determining Fenestration Attachment Product U-Factors.
   b. NFRC 200A Procedure for Determining Attachment Product Solar Heat Gain Coefficient and Visible Transmittance atNormal Incidence.
   c. NFRC 500 Procedure for Determining Fenestration Product Condensation Resistance Values.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

B. Product Data: Manufacturer's standard specifications and descriptive literature, including:
   1. Certified test laboratory reports to show compliance with requirements.
      a. Windows with sizes exceeding the gateway sizes do not qualify under these tests.
      b. Windows manufactured with configurations different than the tested configurations do not qualify under these tests;
         windows can be tested for performance outside the already tested gateway sizes.
      c. Windows with hardware different from what is referenced on the test reports do not qualify under these tests.
   2. Manufacturer's standard head, jamb and sill details.
   3. Installation methods.
      a. Submit manufacturer's written installation instructions.

C. Manufacturer's Certificates: Submit certified independent testing agency reports indicating window unit meets or exceedsspecified performance requirements.

D. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
   1. Provide shop drawings indicating details of construction and installation including, but not limited to, window location chart,window schedule, size, muntin type and design, sections and details of multiple window assemblies, hardware, glazing details, frame type, STC, glass types, screens and handing operation.
   2. Finish: AAMA 611 Anodized Architectural Coatings; AAMA 2605 for Organic Coatings on Aluminum Extrusions.
      a. Class 1 Anodized.

E. Manufacturer's written instructions, including:
   1. Delivery, storage and handling recommendations.
   2. Preparation and installation recommendations.

F. Installer's Experience: Submit verification of evidence of work similar to work of this section.

G. Warranty: Fully executed, issued in [Owner's] name and registered with manufacturer, including:
   1. Manufacturer's [1 year] warranty from date of accepted delivery, covering defects in materials.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 10 years experience in producing aluminum windows of the type specified.
   1. Manufacturer must be certified through the PPG Certified Window Fabricator Program.

B. Installer Qualifications: Licensed contractor with a minimum 3 years experience installing similar windows.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery
   1. Deliver materials in accordance with manufacturer's written instructions and labeling.
   2. Deliver materials in manufacturer's original, unopened, undamaged containers or packaged with identification labels intact,and product name and manufacturer clearly visible and in sizes to suit project.

B. Storage
   1. Store materials upright and protected from exposure to harmful environmental conditions, clean, dry, frost-free and atmanufacturer's recommended temperature and humidity levels.

C. Handling:

1. Exercise care during off-loading and installation to avoid damage and marring of finishes.
2. Handle in a manner to evenly distribute material load and prevent twisting, ending and cracking of windows doors and
associated parts.
3. Replace materials damaged during handling.

1.6 WARRANTY

A. Manufacturer's warranty:
1. Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.
2. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Basis for Design: **Series 5000 by All Weather Architectural Aluminum OR approved equal**.

B. Related Requirements:
1. Section 01 60 00 Product Requirements for submitting comparable product submittals for products by listed manufacturers.

2.2 PERFORMANCE REQUIREMENTS

A. Design pressure, air infiltration and water penetration.
1. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 [CW-PG35].

B. Uniform Load Deflection and Uniform Load Structural to ASTM E330.

C. ASTM E283, Air Leakage: 1.57 psf: 0.3 cfm/ft2 maximum.

D. ASTM E547, Water Penetration: at 4.59 psf: no leakage.

E. ASTM F588, Forced Entry Resistance: Type B Grade 10: Pass for no entry.

2.3 DESCRIPTION

A. Acceptable Material: **Series 5000 Windows by All Weather Architectural Aluminum approved equal**.

B. Aluminum framed fixed windows as indicated, insulating glazing units (IGU) and accessories.
1. Window Dimensions:
a. See drawings for window types and configurations
2. Nail-on Fin.

2.4 MATERIALS

A. Frames: 2 1/4 inches Pour and Debridge, thermally broken extruded aluminum Type 6063 age hardened to T-6 rating for
strength and durability.
1. Integral extrusion wall thickness: 0.094 inches.
2. Nominal web thickness: 1/8 inch.
3. Include full perimeter exterior snap in glazing stops.
4. Corners of frame and ventilators: Mitered and welded; muntin and intermediate bars attached to cross joints and

abutting
sash sections.

5. Finish Types:
   a. Aluminum to AA DAF-45, Class 1, clear anodized.

B. Glazing in accordance with Section 08 80 00 – Glazing.
   1. Insulated glass, 1 inch.

2.5 FABRICATION

A. Miter and weld corner joints of frames.

B. Vents; mitered, corner keyed and crimped.

C. Attach muntin and intermediate bars to cross joints and abutting sections.

D. Ensure sill, vents and intermediate bars have weep holes and are sloped for positive drainage to exterior.

E. Pre-drill and tap frames to receive screen attachment hardware as required.

F. Ensure surfaces to be glazed include bead retaining notch.

G. Ensure operable windows include two rows of weather-stripping in extruded slot at perimeter of vent or opening.

H. Install hardware specified.

2.6 SOURCE QUALITY CONTROL

A. Use only fabricators who have training and experience with similar work of this Section.

B. Ensure all window framing materials come from single manufacturer

PART 3 EXECUTION

3.1 INSTALLER

A. Use only licensed installers who have training and experience with similar work of this Section.

3.2 EXAMINATION

A. Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are
acceptable for aluminum window installation in accordance with manufacturer's written recommendations.
   1. Visually inspect substrate.
   2. Verify openings are dimensionally correct and within allowable tolerances, and substrates are plumb, level and clean.
   3. Verify in the presence of the Architect that anchoring surface is in accordance with approved shop drawings.
   4. Inform Architect of unacceptable conditions immediately upon discovery.
   5. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval toproceed from Architect.
   6. Starting window installation implies substrate conditions are acceptable for Work of this Section.

3.3 INSTALLATION

A. Install aluminum windows in accordance with manufacturer's written recommendations.

1. Ensure operable windows are closed and locked during installation.

3.4 SEALANTS

A. Apply sealant in accordance with manufacturer's written installation guidelines.

3.5 FIELD QUALITY CONTROL

A. Comply with AAMA 502-12.

3.6 CLEANING

A. Clean sealants, caulking and other materials from surfaces, including adjacent work.

B. Clean window frames, casings and glass using materials and methods recommended by the window and glass manufacturer
that do not cause defacement of work.
   1. Clean using methods which comply with AAMA 609.
   2. Clean glass using methods which comply with GANA 01-0300.

C. Protect installed products until completion of project.

D. Touch-up, repair or replace damaged products before Substantial Completion.

3.7 PROTECTION

A. Protect installed aluminum windows from damage during construction.

B. Repair or replace adjacent materials damaged by installation of aluminum windows.

END OF SECTION
08 51 13

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 8 Doors and Frames

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.
   h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

   a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   b. Complete (risers, point-to-point) access control system block wiring diagrams.
   c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
1. Seven years for heavy duty cylindrical (bored) locks and latches.
2. Five years for exit hardware.
3. Five years for motorized electric latch retraction exit devices.
4. Two years for electromechanical door hardware.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in General and Supplementary Conditions. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

   a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

   a. Hager Companies (HA).
   b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
   c. Stanley Hardware (ST).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. Hager Companies (HA) - ETW-QC (# wires) Option.
b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.
c. Stanley Hardware (ST) – C Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – EL-CEPT Series.
b. Securitron (SU) - EL-CEPT Series.
c. Von Duprin (VD) - EPT-10 Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.

b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

a. Hager Companies (HA) - Quick Connect.
b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.
c. Stanley Hardware (ST) – WH Series.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

a. Door Controls International (DC).
b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
c. Trimco (TC).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
5. Keyway: Six pin Everest C135 key way.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.

2. Locks are to be non-handed and fully field reversible.

3. Manufacturers:

a. Corbin Russwin Hardware (RU) – CL3300 Series.
b. Sargent Manufacturing (SA) – 10 Line.
c. Schlage (SC) – ND Series.
d. Yale Locks and Hardware (YA) 5400LN Series.

2.7 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Cylindrical Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical cylindrical locksets, electrified locksets to be of type and design as specified below.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2. Manufacturers:

a. Corbin Russwin Hardware (RU) - CL33900 Series.
b. Sargent Manufacturing (SA) - 10G70/71 Series.
c. Schlage (SC) - ND DEL/DEU Series.

d. Yale Locks and Hardware (YA) - 5480/5490LN Series.

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

10. Rail Sizing: Provide exit device rails factory sized for proper door width application.

11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
    b. Sargent Manufacturing (SA) - 80 Series.

C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.

1. Provide keyed removable feature where specified in the Hardware Sets.

2. Provide stabilizers and mounting brackets as required.

3. Provide electrical quick connection wiring options as specified in the hardware sets.

4. Manufacturers:

    a. Corbin Russwin Hardware (RU) - 700/900 Series.
    b. Sargent Manufacturing (SA) - 980S Series.
    c. Yale Locks and Hardware (YA) - M200 Series.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size.

Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC6000 Series.
b. Norton Door Controls (NO) - 8500 Series.
c. Sargent Manufacturing (SA) - 1431 Series.
d. Yale Locks and Hardware (YA) - 3500 Series.

C. Door Closers, Overhead Concealed (Narrow Profile): ANSI/BHMA 156.4 certified Grade 1 door closers designed for narrow profile frames and doors. Closers to have fully concealed body in the frame head for offset hung applications, with separate and independent valves for closing speed and backcheck adjustments.

1. Manufacturers:

a. Rixson Door Controls (RF) - 91 Series.

2.11 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Hiawatha, Inc. (HI).
b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

a. Rixson Door Controls (RF).
b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
c. Sargent Manufacturing (SA).

2.12 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
3. Reese Enterprises, Inc. (RE).

2.13 ELECTRONIC ACCESSORIES

A. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Manufacturers:

a. Security Door Controls (SD) - 630 Series.
b. Securitron (SU) - BPS Series.

2.14 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

Hardware Sets

Set: 1.0

Doors: 107a, 120a, 139a, 143a, 145a, 145b

1	Continuous Hinge	CFMxxSLF-HD1 EL-CEPTx32D		PE	⚡
1	Exit Device	5CH 55 56 AD8504	US32D	SA	⚡
1	Cylinder	20-057	626	SC	
1	Door Pull	RM3311-36 Mtg-Type 1HD	US32D	RO	
1	Concealed Closer	PH91N	689	RF	
1	Door Stop	471 EXP	US26D	RO	
1	Threshold	Per Detail x FHSL14	Al	PE	
1	Gasket	By Door Manufacturer			
1	Sweep	57AV		PE	
1	Frame Harness	QC-C1500		MK	⚡
1	Door Harness	QC-C__ (length as required)		MK	⚡
1	Power Supply	AQDx (size as reqd)		SU	⚡
1	Electric Power Transfer	EL-CEPT		SU	⚡
1	Card Reader	By Security Contractor			

Notes: Presenting authorized credential to reader on wall momentarily retracts latchbolt allowing door to be pulled open. Exit device has capability of being dogged or undogged electronically for extended periods of time (during business hours).
Power supplies can be consolidated into fewer units with larger capacity. Coordinate with security contractor.

Set: 1.1

Doors: 101a

1	Continuous Hinge	CFMxxSLF-HD1 EL-CEPTx32D		PE	⚡
1	Exit Device	5CH 55 56 AD8504	US32D	SA	⚡
1	Cylinder	20-057	626	SC	
1	Door Pull	RM3311-36 Mtg-Type 1HD	US32D	RO	
1	Automatic Operator, push side	6031	689	NO	⚡
1	Door Stop	471 EXP	US26D	RO	
1	Threshold	Per Detail x FHSL14	Al	PE	
1	Gasket	By Door Manufacturer			
1	Sweep	57AV		PE	
1	Frame Harness	QC-C1500		MK	⚡
1	Door Harness	QC-C__ (length as required)		MK	⚡
2	Push Plate Actuator	639		NO	⚡
1	Power Supply	AQDx (size as reqd)		SU	⚡

1	Electric Power Transfer	EL-CEPT	SU	⚡
1	Card Reader	By Security Contractor		

Notes: Presenting authorized credential to reader on wall momentarily retracts latchbolt allowing door to be pulled open. Exit device has capability of being dogged or undogged electronically for extended periods of time (during business hours).
Power supplies can be consolidated into fewer units with larger capacity. Coordinate with security contractor.

Set: 3.0

Doors: 125a

4	Hinge (heavy weight)	T4A3386 NRP	US32D	MK	
2	Electric Hinge (heavy weight)	T4A3386-QCxx	US32D	MK	⚡
1	Removable Mullion	L980	PC	SA	
1	Rim Exit Device	5CH 55 56 8804 FSW	US32D	SA	⚡
1	Rim Exit Device	5CH 55 8810 EO	US32D	SA	⚡
1	Cylinder	20-057	626	SC	
1	Cylinder	20-061 B520-296	626	SC	
2	Surface Closer	PR8501	689	NO	
2	Kick Plate	K1050 10" High CSK	US32D	RO	
2	Door Stop	471 EXP	US26D	RO	
1	Threshold	Per Detail x FHSL14	Al	PE	
1	Rain Guard	346C x Full Frame Width	Al	PE	
1	Gasket	S44D Head & Jambs		PE	
1	Gasket	5110BL (mullion)		PE	
2	Sweep	57AV		PE	
2	Frame Harness	QC-C1500		MK	⚡
2	Door Harness	QC-C__ (length as required)		MK	⚡
1	Power Supply	AQDx (size as reqd)		SU	⚡
1	Card Reader	By Security Contractor			

Set: 5.0

Doors: 121a, 122a

2	Hinge (heavy weight)	T4A3386 NRP	US32D	MK	
1	Electric Hinge (heavy weight)	T4A3386-QCxx	US32D	MK	⚡
1	Fail Secure Lock	ND80EURD SPA RX	US26D	SA	⚡
1	Surface Closer	PR8501	689	NO	
1	Kick Plate	K1050 10" High CSK	US32D	RO	
1	Door Stop	471 EXP	US26D	RO	
1	Threshold	Per Detail x FHSL14	Al	PE	
1	Rain Guard	346C x Full Frame Width	Al	PE	

1 Gasket	S44D Head & Jambs		PE	
1 Sweep	57AV		PE	
1 Frame Harness	QC-C1500		MK	⚡
1 Door Harness	QC-C__ (length as required)		MK	⚡
1 Power Supply	AQDx (size as reqd)		SU	⚡
1 Latch Protector, Cylindrical Lock	320CXL	US32D	RO	
1 Card Reader	By Security Contractor			

Notes: Presenting authorized credential to reader on wall momentarily unlocks outside lever allowing entry. Egress by inside lever. Free egress at all times. Request to exit switch in inside lever signals access control system of authorized exit.

Set: 6.0

Doors: 108a, 154a

2 Hinge (heavy weight)	T4A3386 NRP	US32D	MK	
1 Electric Hinge (heavy weight)	T4A3386-CCxx	US32D	MK	⚡
1 Fail Secure Lock	ND80EURD SPA RX	US26D	SA	⚡
1 Surface Closer	CLP8501	689	NO	
1 Kick Plate	K1050 10" High CSK	US32D	RO	
1 Threshold	Per Detail x FHSL14	Al	PE	
1 Rain Guard	346C x Full Frame Width	Al	PE	
1 Gasket	S44D Head & Jambs		PE	
1 Sweep	57AV		PE	
1 Frame Harness	QC-C1500		MK	⚡
1 Door Harness	QC-C__ (length as required)		MK	⚡
1 Power Supply	AQDx (size as reqd)		SU	⚡
1 Latch Protector, Cylindrical Lock	320CXL	US32D	RO	
1 Card Reader	By Security Contractor			

Set: 7.0

Doors: 107b, 139b, 207a, 239a

2 Hinge, Full Mortise	TA2714	US26D	MK	
1 Electric Hinge	TA2714 QCxx	US26D	MK	⚡
1 Magnetic Lock, Delayed Egress	iMXDa-CA15S		SU	⚡
1 Fail Secure Exit Device	5CH 8876 ETP	US32D	SA	⚡
1 Cylinder	20-057	626	SC	
1 Kick Plate	K1050 10" High CSK	US32D	RO	
1 Wall Stop	409	US32D	RO	
1 Gasket	S44D Head & Jambs		PE	
1 Frame Harness	QC-C1500		MK	⚡

1	Door Harness	QC-C__ (length as required)	MK	⚡
1	Power Supply	AQDx (size as reqd)	SU	⚡
2	Card Reader	By Security Contractor		

Notes: From Stair side: Presenting authorized credential to reader on wall momentarily unlocks outside lever allowing entry.
From Office side: Pushing on door sounds alarm, and door remains locked for 15 seconds, then releases allowing egress. Card reader on wall shunts alarm and allows immediate egress. Loss of power or signal from fire alarm releases lock without alarm.
Power supplies can be consolidated into fewer units with larger capacity. Coordinate with security contractor.

Set: 8.0

Doors: 145c, 145d

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Exit Device	5CH 16 8813 ETP	US32D	SA
1	Cylinder	20-061 B520-296	626	SC
1	Surface Closer	PR8501	689	NO
1	Kick Plate	K1050 10" High CSK	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasket	S44D Head & Jambs		PE

Set: 9.0

Doors: 102a, 102b, 111a, 113a, 115a, 119a, 124a, 127a, 140a, 143b, 202a, 225a, 226a, 241a, 245a

2	Hinge, Full Mortise	TA2714	US26D	MK	
1	Electric Hinge	TA2714 QCxx	US26D	MK	⚡
1	Fail Secure Lock	ND80EURD SPA RX	US26D	SA	⚡
1	Surface Closer	8501	689	NO	
1	Kick Plate	K1050 10" High CSK	US32D	RO	
1	Wall Stop	409	US32D	RO	
3	Silencer	608		RO	
1	Frame Harness	QC-C1500		MK	⚡
1	Door Harness	QC-C__ (length as required)		MK	⚡
1	Power Supply	AQDx (size as reqd)		SU	⚡
1	Card Reader	By Security Contractor			

Notes: Presenting authorized credential to reader on wall momentarily unlocks outside lever allowing entry. Egress by inside lever. Free egress at all times. Request to exit switch in inside lever signals access control system of authorized exit.

Set: 9.1

Doors: 123a

2	Hinge, Full Mortise	TA2714	US26D	MK
1	Electric Hinge	TA2714 QCxx	US26D	MK ⚡
1	Fail Secure Lock	ND80EURD SPA RX	US26D	SA ⚡
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" High CSK	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasketing	S773D		PE
1	Door Bottom	411ARL		PE
1	Frame Harness	QC-C1500		MK ⚡
1	Door Harness	QC-C__ (length as required)		MK ⚡
1	Power Supply	AQDx (size as reqd)		SU ⚡
1	Card Reader	By Security Contractor		

Notes: Presenting authorized credential to reader on wall momentarily unlocks outside lever allowing entry. Egress by inside lever. Free egress at all times. Request to exit switch in inside lever signals access control system of authorized exit.

Set: 10.0

Doors: 110a, 136a, 155a

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Storeroom Lock	ND80RD SPA	US26D	SA
1	Wall Stop	409	US32D	RO
1	Gasket	S44D Head & Jambs		PE

Set: 11.0

Doors: 130a, 130b, 153a, 153b

6	Hinge, Full Mortise	TA2714	US26D	MK
1	Self-Latching Flush Bolt, top only	2805	US32D	RO
1	Office Lock	ND50RD SPA	US26D	SA
2	Surface Overhead Holder	55-X26	690	RF
2	Silencer	608		RO

Set: 12.0

Doors: 126a, 141a, 204a

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Office Lock	ND50RD SPA	US26D	SA
1	Wall Stop	409	US32D	RO
3	Silencer	608		RO

Set: 13.0

Doors: 228a

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office Lock	ND50RD SPA	US26D	SA
1 Surface OH Stop, HD	9-X36	630	RF
3 Silencer	608		RO

Set: 14.0

Doors: 105a

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office Lock	ND50RD SPA	US26D	SA
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 10" High CSK	US32D	RO
1 Wall Stop	409	US32D	RO
3 Silencer	608		RO

Set: 14.1

Doors: 144a, 227a

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office Lock	ND50RD SPA	US26D	SA
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 10" High CSK	US32D	RO
1 Wall Stop	409	US32D	RO
1 Gasket	S44D Head & Jambs		PE

Set: 14.2

Doors: 142a

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office Lock	ND50RD SPA	US26D	SA
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 10" High CSK	US32D	RO
1 Wall Stop	409	US32D	RO
1 Gasketing	S773D		PE
1 Door Bottom	411ARL		PE

Set: 15.0

Doors: 112a, 114a, 116a, 118a

3 Hinge, Full Mortise	TA2714	US26D	MK

1 Passage Latch	ND10S SPA	US26D	SA
1 Wall Stop	409	US32D	RO
1 Gasketing	S773D		PE
1 Door Bottom	411ARL		PE

Set: 15.1

Doors: 103a, 129a, 131a, 133a, 135a, 137a, 138a, 201a, 209a, 210a, 211a, 212a, 213a, 214a, 215a, 217a, 218a, 219a, 220a, 221a, 222a, 223a, 224a, 230a, 232a, 235a, 236a, 238a, 240a, 242a, 247a, 248a, 249a, 250a, 251a, 252a, 253a, 254a, 255a, 256a

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office Lock	ND50RD SPA	US26D	SA
1 Wall Stop	409	US32D	RO
1 Gasketing	S773D		PE
1 Door Bottom	411ARL		PE

Set: 16.0

Doors: 152a, 152b

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Passage Latch	ND10S SPA	US26D	SA
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 10" High CSK	US32D	RO
1 Wall Stop	409	US32D	RO
1 Gasket	S44D Head & Jambs		PE

Set: 17.0

Doors: 147a, 147b

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Classroom Lock	ND70RD SPA	US26D	SA
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 10" High CSK	US32D	RO
1 Wall Stop	409	US32D	RO
3 Silencer	608		RO

Set: 18.0

Doors: 117a, 134a, 148a, 149a, 150a, 151a, 231a

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Privacy Lock	L9040 L583-363 17A L283-722	626	SC
1 Surface Closer	8501	689	NO
1 Kick Plate	K1050 10" High CSK	US32D	RO

1	Wall Stop	409	US32D	RO
1	Gasket	S44D Head & Jambs		PE

Set: 19.0

Doors: 132a

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Privacy Lock	L9496 L583-363 17A	626	SC
1	Electric Strike	1006CDB x Mode 2 Option	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" High CSK	US32D	RO
1	Wall Stop	409	US32D	RO
1	Gasket	S44D Head & Jambs		PE
1	Power Supply	AQDx (size as reqd)		SU
1	Card Reader	By Security Contractor		

Set: 20.0

Doors: 156a

1	Storeroom Lock	ND80RD SPA	US26D	SA
1	Balance of Hardware	By Gate Supplier		OT

END OF SECTION 08 71 00

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes glazing for the following products and applications in pre-glazed units or site installed applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows.
2. Doors.
3. Glazed entrances.

B. Related Sections include the following:
1. Division 8 Doors, Frames and Storefronts

1.3 DEFINITIONS

A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air.

D. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for 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.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

B. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.

C. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.

D. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:

1. Insulating Glass Certification Council.
2. Associated Laboratories, Inc.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

1.8 WARRANTY

A. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 GLASS PRODUCTS

A. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of class indicated. See drawings for location.

B. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.

1. Sealing System: Dual seal, with primary and secondary sealants as follows:

a. Manufacturer's standard sealants.

2. Spacer Specifications: Manufacturer's standard spacer material and construction.

2.3 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Sealants: As recommended by lass and window frame manufacturers.

C. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

D. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

E. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

F. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

G. 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.

2.4 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with outdoor and indoor faces.

C. Grind smooth and polish exposed glass edges and corners.

2.5 MONOLITHIC FLOAT-GLASS UNITS

A. Clear single pane, non-rated (Interior units and doors):
1. Glass Thickness: 1/4".
2. Glass: Class 1 (clear) float glass

a. Annealed.
b. Tempered where shown or required by code.

3. ½" laminated glass at Reception security glass
4. 1" Dual-glazed windows with ¼" tempered glass at second floor office doors and sidelights.
5. Mirrored one-way dual glazed 45 STC at PV/IT Observation Room.

2.6 INSULATING-GLASS UNITS- EXTERIOR

A. Passive Solar Low-E Insulating-Glass Units (Exterior windows and storefront windows):

1. Vitro Architectural Glass: Solarban 70XL (2) = Clear
2. Outdoor Lite: Class 1 (clear) float glass.
a. Tempered where shown or required by Code.
b. See Title 24 calculations on drawings for minimum energy performance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

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

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 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. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. 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.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

I. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

C. 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; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00

SECTION 08 91 00 – ROOF SCREEN LOUVERS

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.1 SECTION INCLUDES

A. Aluminum louvers as shown on the Drawings and as specified herein, including but not necessarily limited to the following:
   1. Continuous blade type, architectural vision louvers.
   2. Concealed snap-in support clips and accessories.
   3. Factory-applied finish system to louver blades.
   4. Field measurements and verification of all openings and all conditions of the louver installations.

1.2 REFERENCES

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

D. ASTM B 449 - Standard Specification for Chromates on Aluminum.

E. ASTM D 1730 - Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.

F. ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.

G. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

1.3 COORDINATION

A. Coordinate Work with other operations and installation of roofing materials to avoid damage to installed insulation and membrane materials.

1.4 ACTION SUBMITTALS

A. Submit the following in accordance with Division 1:

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Load tables showing louver span capacities.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

C. Shop Drawings:
   1. Layout and erection drawings showing typical cross sections and dimensioned locations of all louver blades, trees, splices and corners. Include erection drawings, elevations, and details where applicable.

D. Selection Samples:
   1. For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples:
   1. For each product specified, two samples, minimum 12 inches (305 mm) long, representing actual product shape and dimensions.

1.5 INFORMATIONAL SUBMITTALS

A. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

B. Warranties: 3 signed copies of the following:
   1. Louver Units including paint finish.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer with a minimum five years documented experience in producing architectural louver systems.

B. Provide aluminum louvers by a firm having undivided responsibility for the entire aluminum louver system design, fabrication and installation, except as otherwise specified herein.

C. Provide aluminum louvers in strict accordance with state and local building codes and ordinances and conforming to applicable wind load factors relative to framing and anchorage.

D. Pre-Installation Meeting:
   1. Convene at job site, at least seven calendar days prior to scheduled beginning of construction activities of this section, to review requirements of this section.
   2. Require attendance by representatives of the installing subcontractor (who will represent the system manufacturer), the mechanical subcontractors and other entities affected by construction activities of this section.
   3. Notify Architect four calendar days in advance of scheduled meeting date.

E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Locate in area designated by Architect.
   2. Construct mock-up, one section of louvers at full height and supported on each end by support member matching those being used in the system design.

3. Do not proceed with remaining work until workmanship, color, and location is approved by Architect.
4. Remove mock-up if required by Architect.
5. Accepted mock-up may remain in place.

F. Provide factory-applied finish aluminum system in accordance with AAMA Specifications, AAMA 2605 for Superior Performance Organic Coatings on Architectural Extrusions and Panels.

1.7 DELIVERY, HANDLING AND STORAGE

A. Deliver louver components to the project site clearly marked for proper identification.

B. Receive, handle and store materials in conformance with the manufacturers printed instructions.

C. Store louver components in accordance with manufacturer's instructions, above ground, in dunnage and protected from weather, construction activities and other causes of damage or loss.

D. Handling: Use a forklift or crane to move material. Do not lift the bundles by the metal bands.
1. Fork Lift: Spread the forks as far as possible to balance the load. Drive slowly when moving long bundles over uneven surfaces to avoid tipping the load
2. Crane: Position the canvas sling straps so that the space between the straps is at least 1/3 the length of the bundle. Use sling straps with looped ends running one end of the strap through the loop at the other end to cinch the bundle when lifted. When setting the load on the roof, put wood blocks under it to protect the roof and allow space to remove the sling straps.
3. Roof Placement: Spread the bundles and crates out as much as possible to avoid overloading the roof structure. Place the material directly over major supports such as beams or trusses.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating louvers without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 WARRANTY

A. Louvers:
1. Provide written warranty, stating that the louvers, exclusive of paint finish, will be free of faults and defects for a period of twenty (20) years from the date of final acceptance by the Owner.
2. Provide warranty signed by the louver manufacturer and installing contractor.

B. Paint Finish:
   1. Provide written warranty stating that the paint finish applied on all louver components will retain its' film integrity, color and chalk as defined below for a period of ten (10) years from the date of final acceptance by the Owner:
      a. Film integrity shall be defined as the absence of peeling, checking, chipping or cracking.
      b. Color Change shall be defined as freedom from fade or change as warranted in ΔE units calculated in accordance with ASTM D 2244. Color Change is measured on an exposed painted surface that has been cleaned of surface soils and chalk and then compared to corresponding values measured on the original or unexposed coated surface.
      c. Chalk or Oxidation shall be defined as a numerical rating as warranted when measured in accordance with the standard procedures specified in ASTM D 4214.
   2. Provide warranty signed by the louver manufacturer and paint finish applicator (if separate from manufacturer).

C. The above warranties are in addition to, and not a limitation of, other rights the Owner may under the Contract Documents.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Design Loads: Comply with Building Code for site location and building height.
   1. Design to resist ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
   2. Design all materials, assembly and attachments to resist snow, wind, suction and uplift loading at any point without damage or permanent set.

B. Thermal Movement: Normal thermal movement is defined as that resulting from a 120 degrees F maximum change (range) in ambient temperature. Base design calculations on actual surface temperatures of metals due to both solar heat gain and night time sky heat loss.

C. Anchors and Connections:
   1. Anchors, connections and assemblies connecting the louvers and associated fabrications to the supporting construction are shown on the Drawings as suggested locations for the louver manufacturer/installer's information. The louver manufacturer/installer is responsible for the structural design and placement of the connections and anchors, including all connecting hardware, accessories and reinforcing necessary for fabrication, and installation of the louvers and associated fabrications.
   2. The louver manufacturer is to notify the Architect in writing prior to the submittal of shop drawings of any changes in the proposed locations of connections and anchors.
   3. The Architect's review of shop drawings is not to be construed as removing responsibility from the louver manufacturer/installer for structural failures related to design, fabrication, installation, and fabrication services.

2.2 MANUFACTURERS

A. Acceptable Manufacturer: RoofScreen Mfg., which is located at: 347 Coral St. ; Santa Cruz, CA 95060; Toll Free Tel: 866-766-3727; Tel: 831-421-9230; Fax: 866-253-0738; Email: request info (info@roofscreen.com); Web: www.roofscreen.com.

B. Substitutions: Permitted 7 days prior to bid opening.

2.3 PRODUCTS

A. Basis-of-Design Manufacturer and Louver: RoofScreen Mfg.
   1. VisionGuard L20 Slatted Louver.

2.4 MATERIALS

A. Aluminum Extrusions: ASTM B 221, 6063-T6 alloy and temper.

B. Fasteners:
   1. Provide exposed fasteners of stainless steel or carbon steel with factory applied protective coating, with finish color coating to match the finish on aluminum.
   2. Provide fasteners not exposed to view of stainless steel or carbon steel with factory applied protective coating.

2.5 FABRICATION

A. Fabricate louvers with close-fitting, field-made splice joints in blades designed to permit expansion and contraction without deforming blades or framework and with supporting members and hardware concealed from front edges of blades so blades have continuous appearance.

B. General:
   1. Fabricate all units to produce uniform sight lines and to be level, plumb and in same plane as adjacent panels.
   2. Accurately fabricate all joints for proper fit.
   3. Protect exposed surfaces against damage from scratches and discoloration.

C. Louvers:
   1. Fabricate continuous blade louvers from minimum 0.1 inch thick extruded aluminum to shapes and configurations shown on the Drawings with welded joints.
   2. Provide support clips from minimum 0.125 inch thick extruded aluminum to comply with specified performance criteria and manufacturer's fabrication procedures and standards.
   3. Provide vertical supports (“trees”) from minimum 3 inch by 3 inch by 0.188 inch thick extruded aluminum angles to comply with specified performance criteria and manufacturer's fabrication procedures and standards, at spacings not further apart than recommended by manufacturer.
   4. Corners:
      a. Provide inside and outside corners fabricated from 6 inch by 6 inch by 0.100 inch thick aluminum trim, painted to match louver blades, to be fastened with exposed fasteners.
      b. Provide inside and outside corners fabricated from mitered and welded louver blades that extend 24 inches in each direction. Finish corners after welding is complete.

D. Provide all accessories and materials for fabrication, assembly and installation required to provide a complete and warranted louver installation.

2.6 FINISH OF ALUMINUM

A. Provide all louver members and accessories free of scratches and serious blemishes affecting the finish system.

B. Fluoropolymer Paint Finish: Factory finish all louver members, accessories, and trim members with fluoropolymer resin base 2 coat paint system containing 70 percent polyvinylidene fluoride (PVDF) fluoropolymer resin. Provide paint finish system consisting of the following:
   1. Processed and clean aluminum in accordance with ASTM B 449, Section 5.
   2. Apply pretreatment conversion coating in accordance with ASTM D 1730, Type B, Method 5 or 7 with pretreatment conversion coating weighing not less than 30 mg per sq ft.
   3. Prime aluminum with thermo-cured inhibitive primer averaging not less than 0.2 to 0.4 mil dry film thickness.
   4. Color coat applied to a minimum thickness of 1.0 to 1.3 mil dry film thickness.
   5. Factory apply the finish paint system in accordance with the manufacturer's printed requirements and performance specifications and the AAMA specification Ref. AAMA 2605 for Superior Performance Organic Coatings on Aluminum Extrusions and Panels.

C. Color selection will be made by the Architect from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine all surfaces to receive parts of the work specified herein. Verify all dimensions of in-place and subsequent construction. Installation of louvers constitutes acceptance of the existing conditions.

3.2 INSTALLATION

A. Set all items in their correct locations as shown on the final reviewed shop drawings, level, square, plumb and at proper elevations and in alignment with other work.

B. Assemble and anchor the various components to allow for expansion and contraction, maintaining a watertight installation.

3.3 CLEANING & PROTECTION

A. After erection, protect exposed portions of the louvers from damage.

B. Just prior to final acceptance, remove protective coverings and clean surfaces with plain water or if required, with a solution as recommended by manufacturer of finish coating system.

C. Touch up finish coat system of all imperfections as recommended by manufacturer of finish coating system.

D. Remove and replace any component that cannot be successfully repaired at no additional cost to the Owner.

END OF SECTION 08 91 00

SECTION 09 24 00 - CEMENT PLASTERING

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. Exterior vertical plasterwork (stucco).
2. Exterior horizontal and nonvertical plasterwork (stucco).

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockups for each substrate and finish texture indicated for cement plastering, including accessories.

   a. Size: 16 sq. ft. in surface area.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.7 FIELD CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Exterior Plasterwork:

1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 deg F.
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E 119 by a qualified testing agency.

2.2 METAL LATH

A. Self Furring Lath: ASTM C 847 with ASTM A 653, G60, hot dipped zinc coating.

1. Davis Wire “Deep Furr” with 3/8” deep furr or equal on walls.

2. Cemco 3/8” Hi Rib Lath at soffits.

2.3 WATER RESISTIVE BARRIER/PAPER BACKING

1. DuPont Tyveck Corporation Stucco Wrap on exterior wall sheathing.

2. Paper Backing: FS UU-B-790a, 60 minute, Grade D paper on the Stucco Wrap.

2.3 ACCESSORIES

A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:

1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 zinc coating.
2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized-zinc coating.
3. External- (Outside-) Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized-zinc coating.
4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.

a. Smallnose cornerbead with expanded flanges; use unless otherwise indicated.

5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
6. Control Joints: Fabricated from zinc-coated (galvanized) steel; 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. **Provide factory fabricated single-piece intersections and joints. No field fabricated joints permitted.** See Details on plans for Control Joint specification.

2.4 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Membrane Flashing: See Section 7 Weather Barriers for self-adhered membrane flashing 12' width to be installed at horizontal lathed surfaces.

C. Bonding Compound: ASTM C 932.

D. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.

E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter unless otherwise indicated.

2.5 PLASTER MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I.

B. Masonry Cement: ASTM C 91, Type N.

C. Plastic Cement: ASTM C 1328.

D. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.

E. Sand Aggregate: ASTM C 897.

F. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, and proprietary ingredients.

2.6 PLASTER MIXES

A. General: Comply with ASTM C 926 for applications indicated.

B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:

1. Portland and Masonry Cement Mixes:

a. Scratch Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

b. Brown Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

2. Plastic Cement Mixes:

a. Scratch Coat: Mix 1 part plastic cement and 2-1/2 to 4 parts aggregate.
b. Brown Coat: Mix 1 part plastic cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.

3. Portland and Plastic Cement Mixes:

a. Scratch Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Base-Coat Mixes for Use over Unit Masonry: Single base (scratch) coat for two-coat plasterwork on low-absorption plaster bases as follows:

1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 0 to 3/4 part lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
2. Portland and Masonry Cement Mix: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
3. Plastic Cement Mix: Use 1 part plastic cement and 2-1/2 to 4 parts aggregate.

D. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters, comply with manufacturer's written instructions.

E. Plaster Finish: Sand float finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and 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 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare smooth, solid substrates for plaster according to ASTM C 926.

3.3 INSTALLATION, GENERAL

A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

3.4 INSTALLING METAL LATH

A. Metal Lath: Install according to ASTM C 1063.

3.5 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External (Outside) Corners:

1. Install lath-type, external-corner reinforcement at exterior locations.

C. Control Joints: Locate as approved by Architect for visual effect and as follows:

1. As shown on the drawings.

3.6 PLASTER APPLICATION

A. General: Comply with ASTM C 926.

1. Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces when measured by a 10-foot straightedge placed on surface.
2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.
4. **Provide adequate fog spraying or other measures to control required curing times**.

B. Bonding Compound: Apply on unit masonry substrates for direct application of plaster.

C. Walls; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork with 7/8-inch total thickness, as follows:

1. Portland cement mixes.
2. Masonry cement mixes.
3. Portland and masonry cement mixes.
4. Plastic cement mixes.
5. Portland and plastic cement mixes.

D. Ceilings; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork and having 3/4-inch, as follows:

1. Portland cement mixes.
2. Masonry cement mixes.
3. Portland and masonry cement mixes.

4. Plastic cement mixes.
5. Portland and plastic cement mixes.

E. Plaster Finish Coats: Apply to provide sand float finish to match Architect's sample.
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3.7 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.

3.8 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of other work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 24 00

SECTION 09 29 00 -GYPSUM BOARD

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. Interior gypsum board.
2. Tile backing panels.

B. Related Sections include the following:

1. DIVISION 05 – Structural Steel
2. DIVISION 07 – Thermal Insulation
3. DIVISION 09 – Interior & Exterior Paints and Coatings.

1.3 SUBMITTALS

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

1. Documentation for **with minimum 4% recycled content.**

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Package for delivery to best protect finish surfaces while using the least amount of single-use packaging as possible. If possible, package and ship product using reusable blankets and fabrics or reusable cardboard and crate systems.

B. Protect materials against weather and contact with damp or wet surfaces from time of delivery through time of installation. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes.

C. Deliver materials only when environmental conditions meet requirements specified for installation areas. If materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

D. When storing prior to installation, raise off floor on pallets, stack flat with protective material between to eliminate chance of creating nicks, scratches, and other imperfections and damage to finish surfaces, wrap weather-tight, and provide for air circulation within and around stacks and under temporary coverings.

E. Do not store materials near other materials that may off-gas or emit harmful fumes, such as kerosene heaters, fresh paint, adhesives, etc.

F. Do not allow materials to become damp. Maintain temperatures at 60°F or higher, and humidity between 20% and 60% prior to, during and after installation.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and protected from weather conditions.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

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

G-P Gypsum.
USG Corporation
Or approved equal

B. Type X:

1. Thickness: 5/8 inch (15.9 mm).

2. Long Edges: Tapered.

C. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces in mechanical, electrical and elevator machine rooms.

1. Core: 5/8 inch, Type X.

2. Long Edges: Tapered.

2.3 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board at Restroom Tile walls:

1. Complying with ASTM C 1178/C 1178M.

a. Product: Subject to compliance with requirements, provide "DensShield Tile Guard" by GP Gypsum.

2. Core: 5/8 inch,

2.4 TRIM ACCESSORIES

A. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

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

   Fry Reglet Corp.
   Gordon, Inc.
   Pittcon Industries.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.

3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Wallboard: Recycled-content paper.

2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

3. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

   a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.

4. Finish Coat: For third coat, use setting-type, sandable topping compound.

5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

D. Joint Compound for Tile Backing Panels:

1. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

3. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Use adhesives that have a COC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Recommended manufacturer/Product: Quiet Solution Quiet Glue.

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

1. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Recommended manufacturer/product: Quiet Solution Quiet Seal.

2.7 **Additive Alternate 2 SOUND ATTENUATION RESILIENT CLIP SYSTEM**

A. Refer to drawing sheet A9.5 for specified system or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4to 9.5-mm-) wide joints to install sealant.

G. 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.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

J.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Layout gypsum board to minimize waste. Reuse cutoffs whenever feasible.

B. Install interior gypsum board in the following locations:

1. Type X: Vertical surfaces and ceilings as indicated on drawings.

2. Moisture- and Mold-Resistant Type: As indicated on Drawings.

C. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.

2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

D. Multilayer Application:

1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or

furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular

to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

4. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners

E. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

F. **Additive Alternate 2** - Install Resilient Sound Clip System in strict accordance with manufacturer's instructions.

3.4 APPLYING TILE BACKING PANELS

A. Water-Resistant Gypsum Backing Board: Install at tiled walls and where indicated. Install with ¼-inch gap where panels abut other construction or penetrations.

B. Glass-Mat, Water-Resistant Backing Panel: Comply with manufacturer's written installation instructions and install at showers, tiled floors, and where indicated. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.

C. Areas Not Subject to Wetting: Install regular-type gypsum wallboard panels to produce a flat surface except at showers, tubs, and other locations indicated to receive water-resistant panels.

D. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For 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.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces. Protect workers and HVAC systems from gypsum dust.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Panels that are substrate for tile.

3. Level 4: Surfaces finish painted or otherwise exposed to view

4. Level 5: Surfaces finish painted or otherwise exposed to view where gypsum board walls are greater than 12 feet in height or located within a common space or assembly space.

E. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

3.7 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.8 WASTE MANAGEMENT

A. Separate clean waste gypsum products from contaminants for recycling in accordance with Waste Management Plan. Do not include wood, plastic, metal, asphalt-impregnated gypsum board, or any gypsum board coated with glass fiber, decorative paper, paint or other finish. Place in designated area and protect from moisture and contamination.

B. Recycle clean waste gypsum products.

1. Return to gypsum board manufacturer.

2. Pulverize and apply on-site as soil amendment if acceptable to Landscape Architect. Do not use products containing glass fiber. Protect granular material from moisture.

C. Separate metal waste in accordance with the Waste Management Plan and place in designated areas for recycling or reuse.

END OF SECTION 09 29 00

SECTION 09 30 00 - TILING

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. Ceramic tile.
2. Crack isolation membrane.
3. Metal edge strips.

B. Related Sections:

1. DIVISION 9 - Gypsum Board

2. DIVISION 7 – Joint Sealants

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."

C. Module Size: Actual tile size plus joint width indicated.

D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum

1.5 ACTION SUBMITTALS

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

B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.

C. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required.
2. Full-size units of each type of trim and accessory for each color and finish required.
3. Stone thresholds in 6-inch lengths.
4. Metal edge strips in 6-inch lengths.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each type of product, signed by product manufacturer.

C. Material Test Reports: For each tile-setting and -grouting product

1.7 MATERIALS MAINTENANCE 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.

2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
1. Crack isolation membrane.
2. Joint sealants.
3. Backer units.
4. Metal edge strips.

D. Preinstallation Conference: Conduct conference at **Project site**.

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.