MONTEREY COUNTY
RESOURCE MANAGEMENT AGENCY

PUBLIC WORKS, PARKS & FACILITIES

PROJECT MANUAL

LAGUNA SECA START-FINISH BRIDGE
PROJECT NO. 8406
BID NO. 10675

TITLE SHEET

BOARD OF SUPERVISORS
COUNTY OF MONTEREY
STATE OF CALIFORNIA

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LAGUNA SECA START-FINISH BRIDGE
PROJECT NO. 8406 BID NO. 10675

The current General Prevailing Wage determined by the State of California Director of Industrial Relations is on file with the Monterey County Resource Management Agency (RMA)

1441 SCHILLING PLACE 2ND FLR
SALINAS CA 93901
(831) 755-4800

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SIGNATURE SHEET

PROJECT MANUAL

LAGUNA SECA START-FINISH BRIDGE
PROJECT NO. 8406 BID NO. 10675

The drawings and specifications were prepared by The Paul Davis Partnership, LLP, under the direct supervision of Paul W. Davis.

Signature

Date

5/30/18

Affix stamp below

PROJECT CONTACTS

LAGUNA SECA START-FINISH BRIDGE
PROJECT NO. 8406
BID NO. 10675

OWNER

COUNTY OF MONTEREY
RESOURCE MANAGEMENT AGENCY
(RMA) – PUBLIC WORKS, PARKS & FACILITIES
ATTN: DAVE PRATT, PROJECT MANAGER
1441 SCHILLING PLACE SOUTH, SECOND FLOOR
SALINAS, CALIFORNIA 93901
TELEPHONE: (831) 755-4800 FACSIMILE: (831) 755-4958
E-MAIL: prattdw@co.monterey.ca.us

ARCHITECT

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ATTN: PAUL W. DAVIS
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MONTEREY CALIFORNIA 93940
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E-mail: paulw@pauldavispartnership.com

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 Monterey County website, Resource Management Agency (RMA) 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 RMA – Public Works, Parks & Facilities, 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 RMA project page: http://www.co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-/public-works-facilities/project-out-to-bid, select *For Resource Management Agency (RMA) 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 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 RMA project page:
[http://www.co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-/public-

works-facilities/project-out-to-bid, select *For Resource Management Agency (RMA) 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 RMA project page: [http://www.co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-/public-works-facilities/project-out-to-bid, select *For Resource Management Agency (RMA) 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 Resource Management Agency-Public Works, Parks & Facilities 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 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 solely on the total amount of the Base Bid. 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.

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 by the Base Bid.

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);

- Such other documents as may be required by the Contract Documents.

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 RMA TO THE ATTENTION OF DAVE PRATT, 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 prattdw@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, RMA shall investigate the bid protest. The protested party shall have three (3) business days to respond to any requests to provide additional information from RMA.

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

RMA shall respond to the protesting party, in writing, stating its findings. The RMA Deputy Director of Public Works, Parks & Facilities 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 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.

BID FORM

Division 003000

MONTEREY COUNTY BOARD OF SUPERVISORS

MAILING ADDRESS		P O BOX 1728 SALINAS CA 93902
PHYSICAL ADDRESS		168 W ALISAL ST 1st FLR SALINAS CA 93901

LAGUNA SECA START-FINISH BRIDGE

PROJECT NO. 8406 BID NO. 10675

NAME OF BIDDER: _____

BUSINESS ADDRESS: _____

_____

TELEPHONE NUMBER: _____

PLACE OF RESIDENCE: _____

BID FORM

LAGUNA SECA START-FINISH BRIDGE

PROJECT NO. 8406 BID NO. 10675

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:

BASE BID: ALL WORK AS NOTED IN DRAWINGS AND SPECIFICATIONS INCLUDING SITE WORK, DEMOLITION OF EXISTING START-FINISH BRIDGE, INSTALLATION OF NEW START-FINISH BRIDGE, APPROACH RAMP AND STAIRS, ELECTRICAL IMPROVEMENTS, AND ACCOMMODATIONS FOR SIGNAGE AND TV MONITORS

_____Dollars

$_____

ALTERNATE BID #1: N/A

☐ ADD TO THE BASE BID OR ☐ DEDUCT FROM BASE BID

N/A_____Dollars

$ N/A_____

TABLE OF UNIT COSTS

Item	*Description*	*Unit*	*Cost*
1	Guardrail at Ramp per Plans sheet A7.3, details 1, 2, 3, 7	Linear feet installed	
2	Fence at Ramp per Plans sheet A7.3, detail 8	Square feet installed	
3	Retaining wall (>10'-13' max) per Plans, sheet S4.1, detail 11	Square feet (face) installed	
4	Retaining wall (>8'-10' max) per Plans, sheet S4.1, detail 15	Square feet (face) installed	
5	Retaining wall (>6'-8' max) per Plans, sheet S4.1, detail 9	Square feet (face) installed	
	(blank)		
	(blank)		
	(blank)		

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 Base Bid. 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. Contractor acknowledges that County will initially make a Conditional Award, which will subsequently be confirmed once state funding is confirmed. 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; and
h) Bidder Certifications
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
RMA- PUBLIC WORKS, PARKS & FACILITIES
DAVE PRATT, 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, secretary, treasurer, and manager thereof; if a partnership, state the 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) managing members; 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.***

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 <u>all</u> 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)

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: _____

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.

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."

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: _____

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: **LAGUNA SECA START-FINISH BRIDGE**, **PROJECT NO. 8406, BID NO. 10675,** 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.

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.

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.

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: _____, [2018] By: _____
(Signature)

Name: _____
(Print Name)

Its: _____
(Title)

END OF DIVISION

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 Resource Management Agency Deputy Director of Public Works, Parks & Facilities.

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:
LAGUNA SECA START-FINISH BRIDGE, PROJECT NO. 8406, BID NO. 10675.

All work shall be completed in strict conformance with the plans, specifications, and working details prepared by THE PAUL DAVIS PARTNERSHIP, LLP, 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 one hundred eighty **(180)** 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 RMA Deputy Director of Public Works, Parks & Facilities 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:

(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)

Unit prices, if any:

(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

None

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.

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. 10675
- Division 007300 Supplementary Conditions, Bid No. 10675
- Specifications and Drawings as Prepared by THE PAUL DAVIS PARTNERSHIP, LLP *(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
RMA- Public Works, Parks and Facilities
Attn: Dave Pratt, Project Manager
1441 Schilling Place, Second Floor
Salinas, California 93901

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

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 RMA – Public Works, Parks & Facilities 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.

COUNTY OF MONTEREY

By: _____

Name: Neville R. Pereira

Title: Interim Deputy Director of Public Works, Parks & Facilities

Date: , 2018

APPROVED AS TO FORM

CONTRACTS/PURCHASING

By: _____

Name: Mike Derr

Title: Contracts/Purchasing Officer

Date: , 2018

APPROVED AS TO FORM & LEGALITY

OFFICE OF THE COUNTY COUNSEL

By: _____

Name: Mary Grace Perry

Title: Deputy County Counsel

Date: , 2018

APPROVED AS TO FISCAL TERMS

COUNTY AUDITOR-CONTROLLER

By: _____

Name: Gary Giboney

Title: Chief Deputy Auditor-Controller

Date: , 2018

APPROVED AS TO INDEMNITY/INSURANCE LANGUAGE

COUNTY COUNSEL-RISK MANAGEMENT

By: _____

Name: Leslie J. Girard

Title: Chief Assistant

Date: , 2018

CONTRACTOR: NAME OF COMPANY

By: _____

Principal Name:

Title:

Date: , 2018

By: _____

Principal Name2:

Title:

Date: , 2018

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/P O BOX 26000/ SACRAMENTO CA 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 or agents and the document shall bear the 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 signature shall be placed above.

PERFORMANCE BOND

(Public Contract Code Section 20129)
Division 006000

WHEREAS, the County of Monterey has awarded to Principal,

_____

as Contractor, for the following project:

LAGUNA SECA START-FINISH BRIDGE, PROJECT NO. 8406, BID NO. 10675; 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.

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 _____, 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) 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.

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:

LAGUNA SECA START-FINISH BRIDGE, PROJECT NO. 8406, BID NO. 10675; 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.

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 _____, 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) 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.

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 LAGUNA SECA START-FINISH BRIDGE, Project No. 8406, 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

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 _____, 2018, 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 LAGUNA SECA START-FINISH BRIDGE PROJECT NO. 8406 located at 1021 Monterey-Salinas Highway, County of Monterey, in the amount of $_____ dated ____ _____, 2018 (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

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:

_____
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.

GUARANTY

Division 006536

TO: The COUNTY OF MONTEREY ("Owner"), for construction of the LAGUNA SECA START-FINISH BRIDGE, 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.

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

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 RMA-Deputy Director of Public Works, Parks & Facilities 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 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.

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.

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;

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

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.)

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.

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.

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 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.

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.

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 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) 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.

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 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.

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 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 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.

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.)

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 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.

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.

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 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 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 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;
    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 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 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 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.

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.

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 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 Architect or Construction Manager, it must, be uncovered for their observation and replaced at 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 is found not to be in accordance with the Contract Documents, Contractor shall pay such costs unless it is found that a separate Contractor caused this condition, and, in that event, County shall be responsible for the payment of such costs.

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 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 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.

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.

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.

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 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 Section6705.

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 investigation regarding structural, mechanical, electrical or any other system existing, 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.

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 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 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.

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 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 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.

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 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.

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 RMA – 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, the Division of Labor Standards Enforcement, of the Department of Industrial Relations.
(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. 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 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 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, 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). 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 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 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 Safety Orders of the Division of Industrial Safety, 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 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.

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.

ARTICLE 32 INDEMNIFICATION AND INSURANCE

32.01 Indemnification. Contractor shall indemnify, defend, and hold harmless County, and officers, agents, and employees 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 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.

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.***

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 cause 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 there under 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 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 of 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 they 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 decision timely, 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.

(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 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.

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 Sections 900 et seq. or Sections 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, 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 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. (Div. 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 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.

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 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 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 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 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 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.

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."

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.

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 One Hundred Eighty (180) 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 site is occupied and fully accessible. CONTRACTOR shall secure the site with temporary fencing. Contractors and deliveries shall enter and exit the site via Monterey-Salinas Hwy gate unless arrangements are made for alternate entry point.

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 Five Hundred Dollars ***[$500 per day]***.

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

4 Executed Contracts	1 Performance Bond
1 Payment Bond	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:

1 fully executed Contract
1 each Addendum
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:

1 Half-size, complete as-built Drawing set showing all information from Contractor, Subcontractor(s), and Sub-Subcontractor(s)
2 CD's with complete as-built Drawings, Operations & Maintenance Manual, and Warranty Certifications (with required contact names, addresses, and telephone numbers) in pdf format
2 Printed Operation & Maintenance Manuals for all installed materials and equipment
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 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.

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 24 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

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

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

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

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. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

6. Proceed with patching after construction operations requiring cutting are complete.

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 waste disposal requirements in Section 015000 "Temporary Facilities and Controls" and Section 017419 "Construction Waste Management and Disposal."

END OF SECTION

SECTION 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition 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 2010 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. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."

2. 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

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. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

D. 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

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

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, complying with requirements in Section 014000 "Quality Requirements," 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

SECTION 02 41 16 - STRUCTURE DEMOLITION

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. Demolition and removal of bridge structure and **site improvements**.
2. Disconnecting, capping or sealing, and **removing** site utilities.
3. Salvaging items for reuse by Owner.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at the Project site.

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for **dust control**.
6. Review procedures for protection of adjacent buildings, site improvements and utilities to remain.
7. Review cleaning measures required to maintain race track in use.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property**,** for environmental protection, for dust control and maintain use of the race track. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain.

B. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of race track operations.

1.7 FIELD CONDITIONS

A. Bridge structure to be demolished will be vacated and their use discontinued before start of the Work.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before building demolition, Owner will remove the following items:

a. Low voltage cabling.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

D. Hazardous Materials: Present in buildings and structures to be demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
3. Owner will provide material safety data sheets for materials that are known to be present in buildings and structures to be demolished because of building operations or processes performed there.

E. On-site storage or sale of removed items or materials is not permitted.

1.8 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations**.**

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Soils report and on the Civil drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.2 PREPARATION

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

1. Owner will arrange to shut off utilities when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
5. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.

a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated.

1. Protect adjacent buildings and facilities from damage due to demolition activities. Protect the surface of the existing race track and adjacent improvements to remain.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
4. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION, GENERAL

A. General: Demolish indicated bridge structure **and** site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Preserve a portion of the bridge structure shown on the plans.
2. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level.

B. Below-Grade Construction: Demolish foundation walls and other below-grade construction that are within footprint of new construction and extending 5 feet outside footprint indicated for new construction. Abandon below-grade construction outside this area.

C. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.

D. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet outside footprint indicated for new construction. Abandon utilities outside this area.

1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Section 312000 "Earth Moving."

E. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.7 SITE RESTORATION

A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction and recycle or dispose of them according to County of Monterey's Construction Waste and Demolition requirements.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION 02 41 16

SECTION 02 51 00 - SITE CONCRETE

PART I - GENERAL

1.1 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.

1.2 DESCRIPTION

A. Extent: The extent of Work in this Section includes the provision of materials and labor for the construction of all concrete elements shown on the Plans.

B. Related work:

1. Earthwork and Grading
2. Landscape Site Furnishings

1.3 STANDARDS

A. Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:

1. The State of California Department of Transportation (CALTRANS) Standard Specifications, except for measurement and payment requirements.

2. Applicable ASTM Specifications as they reasonably apply to this work.

1.4 QUALITY ASSURANCE

A. 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.
   e. HERS Rater.
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.

B. Tolerances: Tolerances for sub-grade, subbase and finished grade shall be as specified by the Standard Specifications except that Contractor shall install the aggregate base and concrete to the minimum thickness shown. No combination of high and low tolerances will be permitted.

C. All concrete work installed that does not conform to the approved samples shall be removed and replaced by the Contractor at the Contractor's expense.

1.5 JOB CONDITIONS

A. Weather Conditions: Construct concrete surface course only when atmospheric temperature is above 40 degrees F., when the underlying base is dry, and when weather is not rainy.

B. Grade Control: Establish and maintain the required lines and grades, including cross-slope during construction operations.

1.6 TESTS

A. Testing and analysis of concrete will be performed under provisions of Section 6-3 of the Standard Specifications.

B. Submit proposed mix design of each class of concrete to Architect for review 10 days prior to the commencement of work.

1.7 SUBMITTALS

A. Product Data: All steel reinforcement, joint filler, sealants, cure, expansion joint filler.

B. Proposed mixed design of each class of concrete to Engineer for review 10 days prior to the commencement of work.

PART II - PRODUCTS

2.1 MATERIALS

A. Forms: Steel or wood, of size and strength to resist movement during concrete placement and to retain straight, true, and to proper elevation, horizontal and vertical alignment until removed. Use forms that are straight and free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required.

B. Dowels: Deformed steel bars, ASTM A 615, Grade 60, unless otherwise shown.

C. Expansion joints: 3/8" thick asphalt impregnated fiberboard.

D. Exposed Concrete: Shall be 28 day strength, 2500psi minimum and shall comply with applicable requirements for concrete materials, admixtures, bonding materials, curing and other except as otherwise noted.

F. Joint asphalt felt filler at expansion joints: ASTM D 1571.

H. Concrete:

1. Cement: Portland cement shall conform to the requirement of ASTM Designation C150, Type II with a minimum of 30% fly ash & 25% recycled aggregate.
2. Water: The water used in the concrete mix shall be clear and free from injurious amounts of oil, salts, acid, alkali, organic matter, or other deleterious substances.
3. Air Entrainment: Air entrainment agents shall conform to ASTM C260. Use five percent (5%) air entrainment: Darex, Sika, or approved equal. Air entrainment shall be at the Contractor’s discretion at the time of the pours.

I. Concrete mix: Shall be as specified in the Standard Specifications: Class B.

J. Curing compound: Water borne, mono molecular film forming and non-staining or coloring; manufactured for application to fresh concrete from the following manufacturers:

1. Burke by Edeco; BurkeFilm
2. ChemMasters: Spray-Film
3. Euclid Chemical Co.; Eucobar

PART III - EXECUTION

3.1 PREPARATION

A. Subgrade: Verify that subbase is properly compacted and at suitable grade and prepare as required in the Geotechnical Report.

B. Protection: Take all steps necessary not to discolor or damage existing improvements. If damage occurs, repair immediately and if repair cannot be made to the satisfaction of the Architect, remove and replace at no expense to the Owner.

3.2 INSTALLATION

A. Form Construction: Set forms to the required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.

B. Reinforcing Placement: Contractor shall inform Owner 24 hours prior to pouring of concrete so reinforcement can be inspected.

D. Concrete Placement: Saturate subgrade as required by the Geotechnical Report to provide a uniform, dampened condition at the time concrete is placed. Place concrete using methods which prevent segregation of the mix, with as little rehandling as possible. Consolidate concrete along the face of forms and adjacent to transverse assemblies, reinforcement, or side forms. Use care to prevent dislocation of reinforcing, dowels, and joint devices. Deposit and spread concrete in a continuous operation between transverse joints. If interrupted for more than 1/2 hour, place a construction joint.

E. Joints: Construct expansion and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise shown. Construct transverse joints at right angles to the centerline, unless otherwise noted.

1. All joints shall be set accurately to grade and straight in alignment as shown on the Plans. Alignment shall not vary more than 1/8" in 10' length.
2. On pavements, construct expansion joints where shown on the plans, and between existing and new concrete pours.
3. Furnish joint fillers in one-piece lengths for the full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Form top edge of filler to conform to top profile of concrete.
4. Protect the top edge of the joint filler during concrete placement with a removable plastic or metal cap or other temporary material. Remove protection after all finish work is completed per manufacturer's recommendations.
5. Tooled Expansion Control Joints: Minimum halfway between expansion joints or as shown on the Plans, width 1/2", depth 3/4 - 1” - deep joint only.

G. Concrete Finishes: After striking-off and consolidating concrete, smooth the surface by screeding and floating. Use hand methods only where mechanical floating is not possible. After floating, test surface for trueness with a 10' straight-edge -- maximum 1/8" variation from any edge to concrete surface. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous, smooth finish. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2" radius, unless otherwise shown. Eliminate any tool marks on concrete surface. After completion of floating and when excess moisture or surface sheet has disappeared, complete surface finishing, as follows:

1. Concrete Walks and Curbing: Broom Finish: Draw a stiff hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture. Texture must be true and straight across entire width of concrete slab.

a. Walks on grades less than 6% slope shall be given a medium broom finish.
b. Walks on grades 6% slope or steeper shall be given a heavy broom finish.

H. Curing:

1. Protect and cure finished concrete, complying with applicable requirements of the Standard Specification sections and manufacturer's recommendation for integrally colored concrete.
2. All concrete shall be cured for at least 7 days after placing. Curing shall be accomplished by applying a membrane curing compound. White liquid membrane curing compound shall not be used.

I. Repair: Repair or replace broken or defective concrete immediately as directed by the Architect.

J. Protection: Protect concrete from damage until acceptance of work.

K. Clean Up: Sweep concrete and wash free of stains, discolorations, dirt and other foreign materials just prior to final inspection.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

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. Ready-mix concrete manufacturer.
    d. Concrete Subcontractor.
    e. Special concrete finish Subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, , curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, anchor rod and anchorage device installation tolerances, steel reinforcement installation, methods for achieving specified floor and slab flatness and levelness floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

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. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

1.6 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Curing compounds.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Aggregates**:** Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

D. Field quality-control reports.

1.7 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. Mockups: Cast concrete formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.

1. Build panel approximately 100 sq. ft. for formed surface in the location indicated or, if not indicated, as directed by Architect.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.9 FIELD CONDITIONS

A. 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 (4.4 deg C) 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.

B. 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.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.
2. ACI 117.

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

    a. High-density overlay, Class 1 or better.
    b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
    c. Structural 1, B-B or better; mill oiled and edge sealed.
    d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

C. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does 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 glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, 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. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

C. Plain-Steel Wire: ASTM A 1064/A 1064M, [**as drawn**] [**galvanized**].

D. Deformed-Steel Wire: ASTM A 1064/A 1064M.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

B. Zinc Repair Material: ASTM A 780/A 780M.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. 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. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

A. Regional Materials: Concrete shall be manufactured within 500 miles of Project site from aggregates that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

C. Cementitious Materials:

1. Portland Cement: ASTM C 150/C 150M, Type I/II, gray
2. Fly Ash: ASTM C 618, Class F or C.
3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
4. Silica Fume: ASTM C 1240, amorphous silica.

D. Normal-Weight Aggregates: ASTM C 33/C 33M, 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.

E. Air-Entraining Admixture: ASTM C 260/C 260M.

F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

G. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing

chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

H. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

I. Water: ASTM C 94/C 94M and potable.

2.6 WATERSTOPS

A. Flexible Rubber Waterstops: CD CRD-C513 for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections and directional changes.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Water: Potable.

C. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

C. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

D. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.

4. Compressive Strength: Not less than [4100 psi (29 MPa)] <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than [5000 psi (34.5 MPa)] <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Normal-weight concrete.

1. Minimum Compressive Strength: 3000 psi at 28 days.
2. Maximum W/C Ratio: 0.45.
3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

B. Foundation Walls: Normal-weight concrete.

1. Minimum Compressive Strength: 3000 psi at 28 days.
2. Maximum W/C Ratio: 0.45.
3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

C. Slabs-on-Grade: Normal-weight concrete.

1. Minimum Compressive Strength: 3,000 psi at 28 days.
2. Maximum W/C Ration: 0.45.
3. Minimum Cementitious Materials Content: 470 lb/cu. yd.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
6. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for ¾-inch nominal maximum aggregate size.
7. Air Content: Do not allow air content of trowel-finished floor to exceed 3 percent.

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/C 94M and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), 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 (ACI 117M).

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Construct 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. 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 ITEM INSTALLATION

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 303.
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not 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 SHORING AND RESHORING INSTALLATION

A. Comply with ACI 318 (ACI 318M) and ACI 301 (ACI 301M) for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting 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 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.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls NTE 40'. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joint on Slab-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

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 (ACI 301M).

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. 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.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.

C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in

amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. 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) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
    b. 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.
    c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
    d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.

2. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed [1/4 inch (6 mm)] [3/16 inch (4.8 mm)] [1/8 inch (3.2 mm)].

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEM INSTALLATION

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) 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 (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

    a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 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 joints 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.

3.13 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 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. 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 matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before

proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

11. 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.
12. 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.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

3.15 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 03 30 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Prefabricated building columns.
3. Field-installed shear connectors.
4. Grout.

B. Related Requirements:
1. Section 05 50 00 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, [miscellaneous steel fabrications and other steel items not defined as structural steel.
2. Section 09 96 00 "Protective Coatings" for surface-preparation and priming requirements.
3. Section 13 34 19 "Metal Building Systems" for structural steel.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.

C. Heavy Sections: Rolled and built-up sections as follows:

1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches (38 mm).
2. Welded built-up members with plates thicker than 2 inches (50 mm).
3. Column base plates thicker than 2 inches (50 mm).

D. 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.

E. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

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 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

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

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

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

D. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator and shop-painting applicators.

B. Welding certificates.

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

D. Mill test reports for structural steel, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. High-strength, bolt-nut-washer assemblies.
3. Shop primers.
4. Nonshrink grout.

F. Survey of existing conditions.

G. Source quality-control reports.

H. Field quality-control and special inspection reports.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD**,** or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172)].

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.

C. Shop-Painting Applicators: Qualified according to SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

E. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 341 and AISC 341s1.
3. AISC 360.
4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.9 DELIVERY, STORAGE, AND HANDLING

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

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

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

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. All structural steel to be primed/painted – see Protective Coatings Section 09 66 00.

B. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC 360.
2. Use Load and Resistance Factor Design; data are given at factored-load level or Allowable Stress Design; data are given at service-load level.

C. Moment Connections: [**Type PR, partially**] [**Type FR, fully**] restrained.

D. Construction: Moment frame and Braced frame.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992/A 992M

B. Channels, Angles M, S-Shapes: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M ASTM A 572/A 572M, Grade 50 (345).

D. Corrosion-Resisting Structural-Steel Shapes, Plates, and Bars: ASTM A 588/A 588M, Grade 50 (345).

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

F. Corrosion-Resisting, Cold-Formed Hollow Structural Sections: ASTM A 847/A 847M, structural tubing.

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

1. Weight Class: Standard.
2. Finish: Galvanized.

H. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.

B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.

C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Mechanically deposited zinc coating.

D. Unheaded Anchor Rods: ASTM F 1554, Grade 36 OR ASTM F 1554, Grade 55, weldable.

1. Configuration: Straight.
2. Nuts: ASTM A 563 (ASTM A 563M) [heavy-]hex carbon steel.
3. Plate Washers: ASTM A 36/A 36M carbon steel.
4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
5. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

E. Headed Anchor Rods:

1. Nuts: ASTM A 563 (ASTM A 563M) [heavy-]hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

F. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened [ASTM A 36/A 36M] carbon steel.
3. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

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

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

I. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

J. Structural Slide Bearings: Low-friction assemblies, of configuration indicated, that provide vertical transfer of loads and allow horizontal movement perpendicular to plane of expansion joint while resisting movement within plane of expansion joint.
   1. Mating Surfaces: PTFE and PTFE.
   2. Coefficient of Friction: Not more than 0.06.
   3. Design Load: Not less than 5,000 psi (34 MPa)
   4. Total Movement Capability: 2 inches (50 mm) <Insert dimension>.

2.4 PRIMER

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.5 GROUT

A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, 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 according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

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

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

   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

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

D. Shear Connectors: Not using welded studs.

A. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
   1. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

2. Cut, drill, or punch holes perpendicular to steel surfaces.
3. Baseplate Holes: Cut, drill or punch holes perpendicular to steel surfaces.
4. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

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

2.8 PREFABRICATED BUILDING COLUMNS

A. Fire-Resistance Ratings: Provide prefabricated building column listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for ratings indicated, based on testing according to ASTM E 119.

1. Fire-Resistance Rating: [**4 hours**] [**3 hours**] [**2 hours**] [**As indicated**].

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 of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.
6. Surfaces enclosed in interior construction.

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

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
5. SSPC-SP 14/NACE No. 8, "Industrial Blast Cleaning."
6. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
7. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."
8. SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning."
9. SSPC-SP 8, "Pickling."

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

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

2.10 GALVANIZING

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

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize shelf angles attached to structural-steel frame and located in exterior walls.

2.11 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

E. Prepare test and inspection reports.

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.

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

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

3.2 PREPARATION

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

1. Do not remove temporary shoring supporting composite deck construction 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 according to AISC 303 and AISC 360.

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

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

D. 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.

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

E. Splice members only where indicated.

F. Do not use thermal cutting during erection[**unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M**].

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

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

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

B. Weld Connections: Comply with AWS D1.1/D1.1M[**and AWS D1.8/D1.8M**] for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs[**where indicated**], back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

a. Liquid Penetrant Inspection: ASTM E 165.

b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

3.6 REPAIRS AND PROTECTION

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

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

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

C. Touchup Priming: Cleaning and touchup priming are specified in Section 09 96 00 "Protective Coatings."

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. KCS-type K-series steel joists.
3. K-series steel joist substitutes.
4. LH- and DLH-series long-span steel joists.
5. CJ-series composite steel joists.
6. Joist girders.
7. Joist accessories.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Section 042000 "Unit Masonry" for installing bearing plates in unit masonry.
3. Section 051200 "Structural Steel Framing" for field-welded shear connectors.

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 ACTION SUBMITTALS

A. Product Data: For each type of joist, accessory, and product.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Laboratory Test Reports for Credit EQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings:

1. Include layout, designation, number, type, location, and spacing of joists.
2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
3. Indicate locations and details of bearing plates to be embedded in other construction.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For [**manufacturer**] [**professional engineer**].

B. Welding certificates.

C. Manufacturer certificates.

D. Mill Certificates: For each type of bolt.

E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

1.6 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[**.**"][**" and "Standard Specifications for Composite Steel Joists, CJ-Series" in "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice."**]

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/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications[**.**"][**" and "Standard Specifications for Composite Steel Joists, CJ-Series" in "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice."**]

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.8 SEQUENCING

A. Deliver steel bearing plates to be built into [**cast-in-place concrete**] [**and**] [**masonry**] construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

1. Use [**ASD; data are given at service-load level**] [**LRFD; data are given at factored-load level**].
2. Design special joists to withstand design loads with live-load deflections no greater than the following:

a. Floor Joists: Vertical deflection of [**1/360**] [**1/240**] of the span.
b. Roof Joists: Vertical deflection of [**1/360**] [**1/240**] of the span.

B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [**25**] [**50**] [**60**] <**Insert number**> percent.

2.2 K-SERIES STEEL JOISTS

A. Manufacture steel joists of type indicated according to "Standard Specifications 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**] [**and**] [**KCS-type K-series steel joists**].

B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."

F. Do not camber joists.

G. Camber joists [**according to SJI's "Specifications."**] [**as indicated**] <**Insert camber requirements**>.

H. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.3 LONG-SPAN STEEL JOISTS

A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements [**as follows:**] [**as indicated.**]

1. Joist Type: [**LH-series steel joists**] [**and**] [**DLH-series steel joists**].
2. End Arrangement: [**Underslung**] [**Square**].
3. Top-Chord Arrangement: [**Parallel**] [**Pitched 1/8 inch per 12 inches (1:96), one way**] [**Pitched 1/8 inch per 12 inches (1:96), two ways**] <**Insert pitch**>.

B. Provide holes in chord members for connecting and securing other construction to joists.

C. Camber long-span steel joists [**according to SJI's "Specifications."**] [**as indicated**] <**Insert camber requirements**>.

D. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.4 COMPOSITE STEEL JOISTS

A. Manufacture steel joists according to "Standard Specifications for Composite Steel Joists, CJ-Series" in SJI's "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice," with steel-angle top- and bottom-chord members and parallel top chord, and with [**underslung**] [**square**] ends.

B. Camber composite steel joists [**as indicated**] <**Insert camber requirements**>.

2.5 JOIST GIRDERS

A. Manufacture joist girders according to "Standard Specifications for Joist Girders" in SJI's "Specifications," with steel-angle top- and bottom-chord members; with end and top-chord arrangements [**as follows:**] [**as indicated.**]

1. End Arrangement: [**Underslung**] [**Underslung with bottom-chord extensions**] [**Square**].
2. Top-Chord Arrangement: [**Parallel**] [**Pitched 1/8 inch per 12 inches (1:96), one way**] [**Pitched 1/8 inch per 12 inches (1:96), two ways**] <**Insert pitch**>.

B. Provide holes in chord members for connecting and securing other construction to joist girders.

C. Camber joist girders [**according to SJI's "Specifications."**] [**as indicated**] <**Insert camber requirements**>.

D. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.6 PRIMERS

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

C. Primer: Provide shop primer that complies with [**Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."**] [**Section 099600 "High-Performance Coatings."**]

2.7 JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of [**horizontal**] [**or**] [**diagonal**] bridging of material, size, and type required by SJI's "Specifications"[**and "Standard Specifications for Composite Steel Joists, CJ-Series" in "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice"**] for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications[**."**][**" and "Standard Specifications for Composite Steel Joists, CJ-Series" in "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice."**] Furnish additional erection bridging if required for stability.

C. Bridging: Fabricate as indicated and according to SJI's "Specifications[**."**][**" and "Standard Specifications for Composite Steel Joists, CJ-Series" in "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice."**] Furnish additional erection bridging if required for stability.

D. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated. [**Shop prime paint**] [**Hot-dip zinc coat according to ASTM A 123/A 123M**].

E. Steel bearing plates with integral anchorages are specified in Section 055000 "Metal Fabrications."

F. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface unless otherwise indicated.

G. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: [**Plain, uncoated**] [**Hot-dip zinc coating, ASTM A 153/A 153M, Class C**] [**Mechanically deposited zinc coating, ASTM B 695, Class 50**].

H. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: [**Plain**] [**Hot-dip zinc coating, ASTM A 153/A 153M, Class C**] [**Mechanically deposited zinc coating, ASTM B 695, Class 50**].

I. Welding Electrodes: Comply with AWS standards.

J. Galvanizing Repair Paint: [**MPI#18, MPI#19, or SSPC-Paint 20**] [**ASTM A 780**].

K. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.8 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 (0.025 mm) thick.

D. Shop priming of joists and joist accessories is specified in [**Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."**] [**Section 099600 "High-Performance Coatings."**]

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.

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[**,"**][**" and "Standard Specifications for Composite Steel Joists, CJ-Series" in "Standard Specifications for Composite Steel Joists, Weight Tables and Bridging Tables, Code of Standard Practice,"**] joist manufacturer's written recommendations, 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 [**bearing plates**] [**and**] [**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 Research Council on Structural Connection's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 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 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect [**field welds**] [**and**] [**bolted connections**] and to perform field tests and inspections and prepare test and inspection reports.

B. Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, as applicable:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709.
c. Ultrasonic Testing: ASTM E 164.
d. Radiographic Testing: ASTM E 94.

C. Visually inspect bolted connections.

D. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

E. Perform additional testing to determine compliance of corrected Work with specified requirements.

3.4 PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists[**, bearing plates,**] [**abutting structural steel,**] and accessories.

1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2, or power-tool cleaning according to SSPC-SP 3.
2. Apply a compatible primer of same type as primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in [**Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."**] [**Section 099600 "High-Performance Coatings."**]

D. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 052100

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. Load-bearing wall framing.
2. Exterior non-load-bearing wall framing.
3. Floor joist framing.
4. Roof rafter framing.
5. Ceiling joist framing.
6. Soffit framing.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for masonry shelf angles and connections.
2. Section 09 96 00 “Protective Coatings”.

1.3 ACTION SUBMITTALS

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

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Delegated-Design Submittal: For cold-formed steel framing.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Product Test Reports: For each listed product:

1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.

4. Mechanical fasteners.
5. Vertical deflection clips.
6. Horizontal drift deflection clips
7. Miscellaneous structural clips and accessories.

D. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Product Tests: Mill certificates or data from a qualified independent testing agency[**, or in-house testing with calibrated test equipment**] indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

C. 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."

D. Comply with AISI S230 "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 FINISHES

A. Exposed Steel: Primed and painted.

B. Hidden steel: Galvanized.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As indicated.
2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
   a. Roof Rafter Framing: Vertical deflection of 1/240 of the horizontally projected span for live loads.

3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and

anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.

B. Cold-Formed Steel Framing Design Standards:

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

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

2.3 COLD-FORMED STEEL FRAMING, GENERAL

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. Grade: ST50H.
2. Coating: G60 (Z180).

2.4 EXTERIOR 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: See plans.
2. Flange Width: 1-5/8 inches.

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: 20 ga., Matching steel studs.
2. Flange Width: 1-1/4 inches.

2.5 ROOF-RAFTER FRAMING

A. Steel Rafters: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0966 inch (2.45 mm).
2. Flange Width: 3 inches, minimum.

2.6 CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0966 inch (2.45 mm).

2.7 FRAMING ACCESSORIES

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

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

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole reinforcing plates.
11. Backer plates.

2.8 ANCHORS, CLIPS, AND FASTENERS

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

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C].

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

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

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

F. Welding Electrodes: Comply with AWS standards.

2.9 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: See Painting Section.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

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

D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

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/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by 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 to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

C. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.

D. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 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 and to 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 (1.6 mm).

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 and install according to Shop Drawings, and complying 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 comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

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

J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 JOIST INSTALLATION

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

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

1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).
2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.

C. Space joists not more than 2 inches (51 mm) from abutting walls, and as follows:

1. Joist Spacing: As indicated.

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

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

1. Install web stiffeners to transfer axial loads of walls above.

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

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

G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

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

3.5 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.

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

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Metal ships' ladders.
3. Miscellaneous steel trim including steel angle corner guards.
4. Metal bollards.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:
1. Section 051200 "Structural Steel Framing."

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 metal fabrications that are anchored to or that receive other work. 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. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Shelf angles.
3. Metal ships' ladders.

4. Metal floor plate and supports.
5. Miscellaneous steel trim including steel angle corner guards, steel edgings, etc..

1.5 INFORMATIONAL SUBMITTALS

A. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.

B. Welding certificates.

C. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

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

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

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.

C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

D. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

E. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

F. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.

G. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

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 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.

B. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1.

C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

D. Anchors, General: 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 E 488/E 488M, conducted by a qualified independent testing agency.

E. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

F. Post-Installed Anchors: chemical anchors.
1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 59, and nuts, ASTM F 594.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work 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 or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are 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.

J. Where units are indicated to be cast into concrete, 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.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

D. Prime miscellaneous framing and supports with primer specified in Section 099600 "High-Performance Coatings" where indicated.

2.6 SHELF ANGLES

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.

1. Provide mitered and welded units at corners.
2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.7 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

2.8 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 40 steel pipe 1/4-inch wall-thickness.

1. Cap bollards with 1/4-inch- thick steel plate.
2. Where bollards are indicated to receive controls for door operators, provide cutouts for controls and holes for wire.
3. Where bollards are indicated to receive light fixtures, provide cutouts for fixtures and holes for wire.

2.9 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated.

2.10 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.11 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.12 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

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 screws, 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 come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

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.

1.

B. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.

1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING METAL BOLLARDS

A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.

B. Anchor bollards to existing construction with **expansion anchors**. Provide four 3/4-inch bolts at each bollard unless otherwise indicated.

1. Embed anchor bolts at least 4 inches in concrete.

C. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

D. Fill bollards solidly with concrete, mounding top surface to shed water.

3.4 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 Painting Section.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

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. Railing gates at the level of exit discharge.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete fill for stair treads and platforms.
2. Section 055213 "Pipe and Tube Railings" for pipe and tube railings.

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 metal stairs. 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.

C. Coordinate locations of hanger rods and struts with other work so that they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

1.4 ACTION SUBMITTALS

A. Product Data: For metal pan stairs and the following:

1. Prefilled metal-pan-stair treads.
2. Abrasive nosings.
3. Paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Verification: For each type and finish of nosing.

D. Delegated-Design Submittal: For stairs, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

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."

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.

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 loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.

C. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Component Importance Factor: 1.5.

2.2 METALS

A. Metal Surfaces, General: 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 A 36/A 36M.

C. Steel Tubing: ASTM A 500.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 coating, either commercial steel, Type B, or structural steel, Grade 33, 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.
2. Nosings: Square-back units, 1-7/8 inches wide, without lip.

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 B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for **exterior stairs**.

2.5 MISCELLANEOUS MATERIALS

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Shop Primers: Provide primers that comply with Painting Section.

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. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

G. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

H. 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.

2.6 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts, 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. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. 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.

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".

G. 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.

2.7 STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel channels.

a. Provide closures for exposed ends of channel stringers.

2. Construct platforms of steel plate or channel headers and miscellaneous framing members as needed to comply with performance requirements.
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.

C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.

1. Steel Sheet: Uncoated cold-rolled steel sheet.
2. Steel Sheet: Galvanized-steel sheel, where indicated.
3. Directly weld metal pans to stringers; locate welds on top of subtreads where they are concealed by concrete fill. Do not weld risers to stringers.
4. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
5. Shape metal pans to include nosing integral with riser.
6. Attach abrasive nosings to risers.
7. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
8. Provide epoxy-resin-filled treads, reinforced with glass fibers, with slip-resistant, abrasive surface.
9. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.

a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

D. Abrasive-Coating-Finished, Formed-Metal Stairs: Form risers, treads, and platforms to configurations shown from steel sheet of thickness [needed to comply with performance requirements, but not less than 0.097 inch.

1. Steel Sheet: Uncoated hot-rolled steel sheet unless otherwise indicated.
2. Directly weld risers and treads to stringers; locate welds on underside of stairs.
3. Provide platforms of configuration indicated or, if not indicated, the same as treads. Weld platforms to platform framing.
4. Finish tread and platform surfaces with manufacturer's standard epoxy-bonded abrasive finish.

2.8 STAIR RAILINGS

A. Comply with applicable requirements in Section 055213 "Pipe and Tube Railings."
1. Rails may be bent at corners, rail returns, and wall returns, instead of using prefabricated fittings.
2. Connect posts to stair framing by direct welding unless otherwise indicated.

B. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: See drawings.
2. Picket Infill: See drawings.
3. Intermediate Rails Infill: See drawings. .

PART 3 - EXECUTION

3.1 INSTALLING METAL PAN STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. 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.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

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. 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.

F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."

1. Install abrasive nosings with anchors fully embedded in concrete. Center nosings on tread width.

H. Install precast concrete treads with adhesive supplied by manufacturer.

3.2 INSTALLING RAILINGS

A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:

1. Anchor posts to steel by welding to steel supporting members.

3.3 ADJUSTING AND CLEANING

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.

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 Painting Section.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055113

SECTION 05 52 13 - 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 pipe and tube railings.

B. Related Requirements:

1. Section 055112 "Metal Pan Stairs" for steel tube railings associated with 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.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

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. Qualification Data: For testing agency.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

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

E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to 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 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 metal fabrications 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.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F ambient.

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.

2.3 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

B. Pipe: ASTM A 53/A 53M, 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 A 36/A 36M.

2.4 FASTENERS

A. General: Provide the following:

1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.
2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
3. Provide exposed fasteners with finish matching 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 indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
3. Provide Phillips flat-head machine screws for exposed fasteners unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Shop Primers: Provide primers that comply with Painting Section.

F. Intermediate Coats and Topcoats: Provide products that comply with Painting Section**.** Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.

G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

H. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

I. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

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. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. 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.

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. Provide weep holes where water may accumulate.

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 resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form Changes in Direction as Follows:
1. By bending or by inserting prefabricated flush-elbow fittings.

K. 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.

L. Close exposed ends of railing members.

M. 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.

N. 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.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

Q. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.7 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize [**exterior**] [**indicated**] steel railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.

E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:

1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Railings Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Railings: SSPC-SP 3, "Power Tool Cleaning."

F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

G. Shop-Painted Finish: Comply with Painting Section**.**

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. 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.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. 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.

C. 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, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.3 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.

D. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
1. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

E. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.4 ATTACHING RAILINGS

A. Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.5 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Painting Section.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.6 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.

END OF SECTION 055213

SECTION 06 73 13 - FIBER REINFORCED POLYMER (FRP) BRIDGE DECKING

1. Summary

This Section includes the requirements for furnishing Fiber Reinforced Polymer (FRP) pedestrian bridge decking including materials, design criteria, testing, transportation and installation support. This work includes the fabrication and finishing of the FRP pedestrian bridge decking as well as installation support of the decking in accordance with this specification and the project plans. The installing contractor's work is to include but is not limited to the following:

1.1. Supply and installation of FRP pedestrian decking.
1.2. Verify in the field all dimensions, elevations and materials required for the installation of the FRP pedestrian decking and report to the engineer any discrepancy with the contract drawings prior to release of the FRP pedestrian deck fabrication.
1.3. Determine quantities of FRP pedestrian decking to complete the work.
1.4. Other appurtenances or related work, as specified herein, directed by the Engineer, or as shown on the contract drawings.

2. Materials of Construction

2.1. Vinyl Ester Resin – All resins shall be vinyl ester and shall be the same resin throughout the project.
2.2. Fiberglass – All reinforcement shall be commercial grade E-glass fiber.
2.3. Pigments – All pigments shall be polydispersion liquid pigments.
2.4. Edge Coatings – Exposed edges of FRP pedestrian decking shall have a two part polyurethane system that is designed for high UV exposure.
2.5. FRP Panels
2.5.1. The deck panels shall be manufactured with a resin infusion process such that the top and bottom facesheet skins are integral to the webs. Assembly from separate skins and web shapes shall not be considered as equal.
2.5.2. Edges and ends must be integral with the facesheet skins and seal the interior of the panel.
2.5.3. The deck panels shall be manufactured with a 2 pcf polyisocyanurate closed cell foam core in order to prevent any water from settling in the interior of the panel.
2.5.4. Any areas that require drilled holes through the deck that would expose the foam to the elements should have a minimum of 16 pcf polyurethane foam designed for long term water exposure.
2.5.5. If required in the plans, the deck panels shall be manufactured with a crown or cross slope in order to facilitate drainage of water. The crown or cross slope shall be incorporated in the deck panel fabrication. Build-up of the wear surface to form a crown or cross slope will not be acceptable.
2.5.6. The deck panels shall be manufactured with embedded steel elements that are chemically interfaced to the FRP skins for connecting the deck to the support beams.
2.5.7. The color of all exposed FRP shall be uniform and shall be selected by Architect form standard color options.
2.5.8. Environmental protection: All exposed FRP surfaces shall be protected against weathering and ultraviolet damage.
2.6. Non-slip Wearing Surface
2.6.1. Wearing surface shall be a non-skid, polyurethane and methyl methacrylate system with quartz aggregate that is shop applied to the top surface of the FRP.
2.6.2. The color of the wearing surface shall be uniform and shall be selected by Architect form standard color options.
2.6.3. The texture of the wearing surface shall be appropriate for pedestrian traffic.
2.7. Connection Hardware – The FRP pedestrian decking shall be connected to the support beams with galvanized steel clips that capture the support beams. If applicable, the deck panels shall be set to the proper slope using shims prior to the final connection of the bolts and clips.

3. Properties

3.1. Physical Properties – The tables below detail the minimum properties required for both the Fiber Reinforced Polymer (FRP) Deck Panels and the shop applied Wear Surface.

Required Physical Properties for FRP Materials		
Physical Property	Requirement	ASTM
Barcol Hardness	Greater than 35	D2583
Glass Transition Temperature	Greater than180°F (82°C)	D4065
Coefficient of Thermal Expansion	Between than 6 and10 x 10^{-6} in/in/°F	D696
Moisture Equilibrium Content	Less than 2%	D570

Required Properties for Wear Surface		
Physical Property	Requirement	ASTM
Tensile Strength @ 68°F (20°C)	1500 psi	D638-10
Elongation at fracture @ 68°F (20°C)	158%	D638-10
Tensile Adhesion to FRP Deck	400 psi minimum	ASTM D4541-09

3.2. Dimensions & Tolerances – See table below.

Dimensional Tolerances	
Measurement	Tolerance
Overall Depth	± 1/16”
Straightness (bow)	± 1/8” per 10’
Panel Length/Width	± 1/4”
Weight per sf	+/- 15%

3.3 Design Criteria

3.3.1 Loading Criteria: FRP deck panels shall be designed as a non-composite, simple span to resist the following three load cases. These load cases are not to be combined.

3.3.1.1 Uniform pedestrian loading of 90 psf.

3.3.1.2 Uplift load of 30 psf.

3.3.1.3 Maintenance vehicle loading to HS-5

3.3.2 Deflection criteria: FRP deck panels shall be designed to limit deflection under pedestrian live load to a maximum of L/360 with the span (L) measured from the center-to-center of deck support beams. Deflections shall be calculated assuming simple spans with no continuity over the deck floor beams. HS-5 loading shall have a minimum deflection limitation of L/300.

3.3.3 Flexure Criteria: Unless otherwise approved by the Engineer, the maximum allowable bending strain in the FRP deck panels shall be limited to 20% of strain to failure under service loads.

3.3.4 Shear Criteria: Unless otherwise approved by the Engineer, the maximum allowable shear strain in the FRP deck panels shall be limited to 20% of strain to failure under service loads.

3.3.5 Crushing: Unless otherwise approved by the Engineer, the minimum crushing strength of the FRP deck panels shall be 150psi.

3.3.6 Design Properties: All design properties shall be reduced statistically to at least 90% of the population of material values that are expected to equal or exceed this tolerance bound with 95% confidence. The following environmental factors shall then be applied to these statistically reduced design values.

Environmental Factors		
Property	**Strength Retention Factor**	**Modulus Retention Factor**
Tensile/Compression	0.88	0.95
Shear	0.92	0.97

3.4. Fire Performance – (FRP) Pedestrian Decking shall have Class I fire resistance per ASTM E-84.

3.5. Temperature – Cover shall operate in a temperature range of -40°F to 160°F.

4. Manufacturing

4.1. Processing – Manufacture FRP pedestrian decking as detailed in the contract plans and tolerances listed in Section 3.2. The FRP pedestrian decking shall be reinforced with fiberglass elements to achieve the design criteria listed in Section 3.3.

4.2. Quality assurance - Provide specific quality assurance testing and measurements to assure finished FRP pedestrian decking meet the functional and performance requirement for the intended application. This also includes mechanical testing to verify material and structural properties as well as post-manufacturing dimensional measurements. FRP pedestrian decking supplier shall be ISO 9001 Compliant.

4.3. Identification - Label the FRP pedestrian decking with identification numbers consistent with the numbering system shown on the shop drawings. Each deck panel shall have a unique identifier to facilitate traceability of materials and processes.

4.4. Documentation - Assemble and maintain project documentation for the FRP pedestrian decking project as follows:

4.4.1 Design data and calculations

4.4.2 Shop drawings

4.4.3 Manufacturing quality control records including material traceability and dimensional results

4.4.4 Installation instructions

4.5 Panel Marking - The manufacturer shall clearly mark each FRP pedestrian deck to indicate the serial number and nominal weight. The identification shall not be visible in the final installation.

4.6 Approved Supplier – FRP pedestrian decking shall be supplied by Composite Advantage, 750 Rosedale Drive, Dayton, Ohio, 45402.

5. Testing

5.1. Full Scale Testing

5.1.1. FRP decking shall have been tested with similar support conditions of the installed decking and a minimum panel width of 46”. Apply 6” wide load footprint at the center (across the entire width) of the deck. Measure the deflection in the center of the loading footprint. Deflection cannot exceed L/360 when normalized for a distributed load. Failure load must exceed 5 times the service load.

5.1.2. FRP decking shall have been tested with similar support conditions of the installed decking and a minimum panel width of 46”. Apply wheel load for HS-5 vehicle at the center of the deck. Measure the deflection in the center of the loading footprint. Deflection cannot exceed L/300. Failure load must exceed 5 times the service load.

5.1.3. FRP decking shall have been tested for crushing strength. Apply a 10” x 10” load footprint to the top of the deck with the rigid support underneath. Deck must have a crushing strength in excess of 150 psi.

6. Submittals

6.1. Manufacturer’s Qualifications **–** Submit proof of manufacturer’s qualifications. The manufacturer of the FRP deck panels shall have an established acceptable performance history with FRP bridge decks of a minimum of 5 years on a minimum of 5 separate installations. Information shall also be submitted on the proposed polyurethane and methyl methacrylate wear surface showing it has been in service a minimum of 10 years on a minimum of 10 separate installations.

6.2. Manufacturer’s Plan – Submit the manufacturer's plan that details the manufacture of FRP pedestrian decking. At a minimum, the plans shall include the following:

6.2.1. Materials - Provide details on fiber and resin such as fiber architecture, and mechanical properties to be used in the FRP manufacturing process.

6.2.2. Assembly - Provide assembly details for both shop- and field-assembled components. This includes details of the connection to the bridge superstructure.

6.2.3. Wearing Surface - Provide manufacturer’s technical data and installation instructions for wearing surface.

6.3. Shop Drawings – Submit shop fabrication drawings of the FRP pedestrian decking assembly with shop applied wearing surface for review and approval. The following information shall be included as a minimum:

6.3.1. Cross sectional and overall dimensions of all FRP components, including details regarding FRP connections.

6.3.2. Recommended lifting method and locations.

6.3.3. Instructions and recommendations for panel delivery, storage and installation.

6.3.4. Calculation of weight (pounds per square foot) of FRP bridge deck assembly with wearing surface.

6.4. Design calculations prepared and stamped by a professional engineer registered in the State of Califiornia.

6.5. Samples – Submit one (1) - 12" by 12" square sample of the polyurethane and methyl methacrylate wearing surface system applied to a fiberglass substrate. The samples shall include the proposed color and surface texture.

6.6. Test Report - Test data demonstrating that the proposed materials and pedestrian decking comply with the performance requirements specified in Section 5.

7. Delivery and Installation

7.1. Delivery - FRP pedestrian decking shall be delivered by truck or rail.

7.2. Installation support – Supplier shall provide a qualified technical representative for three days to facilitate the installation procedure as an advisor. Installation of the FRP pedestrian decking is not within the scope of supply of the manufacturer or manufacturer’s representative.

7.3. Storage and handling - Perform site handling and erection with conventional equipment and methods in accordance with the manufacturer’s recommendations.

8. Warranty

FRP pedestrian decking manufacturer shall issue a twelve (12) month warranty against defects in workmanship and materials from the date of acceptance of FRP pedestrian decking. Contractor shall provide warranty and any other required documentation from this section to the owner or owner’s engineer.

SECTION 07 41 13.16 - STANDING-SEAM METAL ROOF PANELS

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 standing-seam metal roof panels.

B. Related Sections:

1. Section 074213.53 "Metal Soffit Panels" for metal panels used in horizontal soffit applications.
2. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at the Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review structural loading limitations of purlins and rafters during and after roofing.
6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
8. Review temporary protection requirements for metal panel systems during and after installation.
9. Review procedures for repair of metal panels damaged after installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 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 type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical roof area and eave**, including fascia,** as shown on Drawings; approximately 48 inches square by full thickness, including attachments**, underlayment,** and accessories.
2. Build mockups for typical roof area only, including accessories.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.

B. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

C. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

2.2 STANDING-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

B. Vertical-Rib, Snap-Joint, Curved Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product approved the the Substitution proves in specifications.

3. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel

sheet complying with ASTM A 792/A 792M, coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 0.034 inch.
b. Exterior Finish: Manufacturer's standard coatings for specified product on plans
c. Color: Selected from Pac-Clad Standard Colors group

4. Clips: One-piece fixed or Two-piece floating to accommodate thermal movement.

a. Material: 0.028-inch-nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

5. Panel Coverage: 20 inches.
6. Panel Height: 1.0 inch.

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
3. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.
b. Grace Construction Products, a unit of W. R. Grace & Co.; [Grace Ice and Water Shield HT] [Ultra].
c. Henry Company; Blueskin PE200 HT.
d. Kirsch Building Products, LLC; Sharkskin Ultra SA.
e. Metal-Fab Manufacturing, LLC; MetShield.
f. Owens Corning; WeatherLock Metal High Temperature Underlayment.
g. <Insert manufacturer's name; product name or designation>.

B. Felt Underlayment: ASTM D 226/D 22M, Type II (No. 30), asphalt-saturated organic felts.

C. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match roof fascia and rake trim.

E. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot-long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.

F. Panel Fasteners: Self-tapping screws designed to withstand design loads.

G. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.5 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:
1. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.

2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

    a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated **below**, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the entire roof surface.

B. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless-steel, or hardware-bronze fasteners.
4. Stainless-Steel Panels: Use stainless-steel fasteners.

C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
5. Watertight Installation:

    a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
    b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Clipless Metal Panel Installation: Fasten metal panels to supports with screw fasteners at each lapped joint at location and spacing recommended by manufacturer.

G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.

H. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

I. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

J. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.
2. Connect downspouts to underground drainage system indicated.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113.16

SECTION 07 42 13.13 - FORMED METAL WALL PANELS

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. Exposed-fastener, lap-seam metal wall panels.
2. Concealed-fastener, lap-seam metal wall panels.

B. Related Sections:
1. Section 074213.23 "Metal Composite Material Wall Panels" for metal-faced composite wall panels.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at the **Project site**

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 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 type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly including corner, supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.
2. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

2.2 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS

A. General: Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Corrugated-Profile, Exposed-Fastener Aluminum Wall Panels:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. AEP Span; a BlueScope Steel company.
    b. Alcoa Inc.
    c. ATAS International, Inc.
    d. Berridge Manufacturing Company.
    e. CENTRIA Architectural Systems.
    f. Englert, Inc.
    g. Fabral.
    h. Firestone Metal Products, LLC.
    i. Flexospan Steel Buildings, Inc.
    j. Industrial Building Panels.
    k. MBCI; a division of NCI Building Systems, L.P.
    l. McElroy Metal, Inc.
    m. Metal Sales Manufacturing Corporation.
    n. Morin; a Kingspan Group company.
    o. PAC-CLAD Petersen

3. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

    a. Thickness: 0.032 inch and 0.050 inch.
    b. Exterior Finish: Pac-Clad Standard Colors and standard spec for application to the panels
    c. Color: As selected by Architect from manufacturer's full range.

2.3 METAL LINER PANELS

A. General: Provide factory-formed metal liner panels designed for interior side walls and field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for a complete installation.

1. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

    a. Thickness: 0.032 inch.
    b. Surface: Smooth, flat finish.
    c. Exterior Finish: Same as siding panel

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.5 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.

3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.

B. Fasteners:
1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

C. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.

D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

E. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13

SECTION 07 42 13.23 - METAL COMPOSITE MATERIAL WALL PANELS

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 metal composite material wall panels.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at the Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal composite material panel Installer, metal composite material panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal composite material panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal composite material panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal composite material panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal composite material panel assembly during and after installation.
8. Review procedures for repair of panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 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 type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal composite material panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.

2. Accessories: Include details of the flashing, trim and anchorage, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal composite material panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Composite Material Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal composite material panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal composite material panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal composite material panel assembly, including supports, attachments, and accessories.
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.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal composite material panels, and other manufactured items so as not to be damaged or deformed. Package metal composite material panels for protection during transportation and handling.

B. Unload, store, and erect metal composite material panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal composite material panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal composite material panels to ensure dryness, with positive slope for drainage of water. Do not store metal composite material panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal composite material panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal composite material panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal composite material panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite material panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Structural failures including rupturing, cracking, or puncturing.
    b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal composite material panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal composite material panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 330:

1. Wind Loads: As indicated on Drawings.
2. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 METAL COMPOSITE MATERIAL WALL PANELS

A. Metal Composite Material Wall Panel Systems: Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assembly components, panel stiffeners, and accessories required for weathertight system.

1. Products: Subject to compliance with requirements, provide the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide PAC-CLAD Composite Wall Panels PAC-3000 CS or comparable product by one of the following:

a. 3A Composites USA, Inc.
b. Alcoa Inc.
c. CENTRIA Architectural Systems
d. Citadel Architectural Products, Inc.
e. Firestone Metal Products, LLC.
f. Protean Construction Products, Inc.

B. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch-thick, coil-coated aluminum sheet facings.

1. Panel Thickness: 0.157 inch (4 mm).
2. Core: Standard.
3. Exterior Finish: Reynobond Colorweld 500

a. Color: As selected by Architect from manufacturer's full range.

C. Attachment Assembly Components: Formed from extruded aluminum.

D. Attachment Assembly: Manufacturer's standard Clip.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite material panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite material panels unless otherwise indicated.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite material panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite material panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal composite material panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal composite material panels and remain weathertight; and as recommended in writing by metal composite material panel manufacturer.

2.4 FABRICATION

A. General: Fabricate and finish metal composite material panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Fabricate metal composite material panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal composite material panel supports, and other conditions affecting performance of the Work.

    1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal composite material wall panel manufacturer.

B. Examine roughing-in for components and assemblies penetrating metal composite material panels to verify actual locations of penetrations relative to seam locations of metal composite material panels before installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal composite material panel manufacturer's written recommendations.

3.3 METAL COMPOSITE MATERIAL PANEL INSTALLATION

A. General: Install metal composite material panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor metal composite material panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal composite material panels.
2. Flash and seal metal composite material panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal composite material panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal composite material panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal composite material panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal composite material panel manufacturer.

D. Attachment Assembly, General: Install attachment assembly required to support metal composite material wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

E. Installation: Attach metal composite material wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.

1. Wet Seal Systems: Seal horizontal and vertical joints between adjacent metal composite material wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."

F. Clip Installation: Attach panel clips to supports at locations, spacings, and with fasteners recommended by manufacturer. Attach routed-and-returned flanges of wall panels to panel clips with manufacturer's standard fasteners.

1. Seal horizontal and vertical joints between adjacent panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."
2. Seal horizontal and vertical joints between adjacent metal composite material wall panels with manufacturer's standard gaskets.

G. Track-Support Installation: Install support assembly at locations, spacings, and with fasteners recommended by manufacturer. Use manufacturer's standard horizontal tracks and vertical tracks that provide support and secondary drainage assembly, draining to the exterior at horizontal joints through drain tube. Attach metal composite material wall panels to tracks by interlocking panel edges with manufacturer's standard "T" clips.

1. Attach routed-and-returned flanges of wall panels to perimeter extrusions with manufacturer's standard fasteners.

2. Attach flush wall panels to perimeter extrusions by engaging panel edges and by attaching with manufacturer's standard structural silicone adhesive.
3. Install wall panels to allow individual panels to "free float" and be installed and removed without disturbing adjacent panels.
4. Do not apply sealants to joints unless otherwise indicated.

H. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal composite material panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal composite material panel manufacturer; or, if not indicated, provide types recommended in writing by metal composite material panel manufacturer.

I. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal composite material wall panel units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing agency to perform field tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal composite material wall panel installation, including accessories.

C. Metal composite material wall panels will be considered defective if they do not pass test and inspections.

D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

E. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal composite material panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal composite material panel installation, clean finished surfaces as recommended by metal composite material panel manufacturer. Maintain in a clean condition during construction.

B. After metal composite material panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal composite material panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.23

SECTION 07 46 00 - GLASS-FIBER-REINFORCED WALL PANELS

PART 1: GENERAL

1.1 GENERAL REQUIREMENTS

.1 Conform to the requirements of Division 1 in addition to the requirements of this section.

1.2 DESCRIPTION OF WORK

.1 This sub-trade is responsible for the supply and installation of the following items, including all related labour and materials necessary to successfully complete the installation of same whether or not on the Contract Documents.

1. Composite building panels
2. Fastening system
3. Closures and related trim
4. Caulking and sealants
5. Other related work as indicated on Drawings and Specifications.

1.3 QUALITY ASSURANCE

.1 Manufacturer's Qualification: 20 year minimum experience in Manufacturing Glass Fibre Reinforced Concrete Panels.

.2 Execute the work of this section only by a Subcontractor meeting the following qualifications:

.1 Has adequate plant, equipment, and skilled workers to perform it expeditiously.

.2 Is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.3 Is certified by the system manufacturer for installation of their system. Submit written certification to Consultant prior to commencing the work of this section.

.4 Panel cladding installation: shall be applied by applicator trained and approved by manufacturer for application of its products

.3 Provide a written guarantee covering the replacement of defective work for a period of one year from the expiry of the standard one year General Contractor's warranty.

.4 The following will be deemed as defective work; leakage, failure to stay in place, undue cracking, chipping or adjacent deformations, panel deformation, buckling, spalling, deterioration of surface. Failure of 15 % of surface area of panels shall be deemed a total failure of the installation requiring complete re-application of the panels.

1.4 SHOP DRAWINGS

.1 Building panel shop drawings shall be submitted to the Consultant for review. No work shall be fabricated before review of shop drawings by the Consultant. Submit shop drawings in accordance with SECTION 01 33 00.

.2 Indicate on the drawings all information required to fabricate and install components of the Section. This shall include product and material standards, dimensions, connection and jointing details, gauges, finishes, etc. ensure that plan and section details of interior and exterior corners, horizontal and vertical joints, fascias and soffits, cut-outs, misc. trim, fastening methods etc., are shown at a minimum 1:5 scale.

1.5 SAMPLES

.1 Submit samples in accordance with SECTION 01 33 00 - Submittal Procedures.

.2 Submit duplicate 150mm x 150mm samples of wall panels, representative of finishes and colours.

PART 2: PRODUCTS

2.1 PANEL SYSTEM

.1 The following specified products and materials form the complete building panel system required for this Project. Ensure that only compatible products and materials are used. Alternates may only be used if approved, in writing, by the Consultant.

.2 Panels shall be exposed aggregate faced panels, and are to be face fastened. They shall consist of inorganic fibre with natural stone and cement.

.3 Panels to have the following physical properties:

.1 Density: 2086 kg/m^3
.2 Tensile Strength: ASTM D790, 22 MPa.
.3 Tensile modulus: ASTM D229, 600 N/mm^2
.4 Flexural strength: ASTM D229, 50 MPa
.5 Flexural modulas: ASTM D790, 4137 N/mm^2
.6 Edge Comp. strength: ASTM D790, 31 MPa
.7 Impact strength: ASTM D2794, 1371 Nmm/mm^2
.8 Co-efficient of linear thermal expansion: ASTM D696, D696, 27 x 10^{-6}
.9 Thermal conductivity: 0.7 W/m/°C.
.10 Water vapour transmission: ASTM E96, 4.38 ng.Pa^{-1}s^{-1}m^{-1}
.11 Water absorption: ASTM D570, 4.5%
.12 Air Permeability: 1.46 ng.Pa^{-1}s^{-1}m^{-1}

.4 Panels shall be fabricated in the factory to ensure that they are the same size, consistent in colour and free from warps, cracks and other imperfections. The panels shall be Synstone, Series#0, #1, #2 or #3 depending on location with a nominal overall thickness of 8mm (5/16"), 10mm (3/8") or 13mm (1/2") or as specified.

.5 These panels shall be non-combustible when tested to ASTM E-136-81 (Also CAN4-S114M80)

.6 Panels shall be glass fibre reinforced concrete Synstone panels as manufactured by Concrete Cladding Systems Ltd. 905-607-8304, supplied and installed as per the manufacturer's latest published data, and as noted on the Drawings and Specifications.

.7 Panels are coloured through using synthetic iron oxide pigments, colour selected from manufacturer's full range

.8 The concrete panel has been designed for a wind load of 25 psf. Based on the recommendation of the Prestressed Concrete Institute (PSI), a factor of

Safety of 4 to 6 should be used for GFRC materials. A safety factor of 4 has been used in this design calculation.

2.2 STRUCTURAL SHAPES

18 Gauge and 16 Gauge galvanized brake shapes conforms to ASTM A653
Coating designation: Metric Z275-275grams/m² both sides
Imperial G90 - 90oz/ft² both sides
Pre-painted brake shapes for light gauge trims galvanized substrate Z275/G90 with Perspectra series paint by Dofasco.
Bug Trim 26 Gauge Galvalume.

2.3 FASTENERS

a – Concrete and brick masonry walls, use 3/16" Tapcon self-tapping concrete anchors, with minimum 1 ½" minimum effective embedment or equivalent products.

b – Steel and woods studs, use #8-18 Rock-on wafer head self-drilling screws from Buildex, or equivalent products.

c – All screws should have sufficient corrosion resistance or be coated with Climaseal, or equivalent corrosion resistant products.

d – The distance between fasteners both vertically and horizontally should not be more than 18" C.O.C. and also not less than ½" from the panel's edge. Care should be taken that the head of the screw does not penetrate the panel surface. Note that the head of the screw must be colour matched to the panel.

e – A joint gap of not less than ¼" must be maintained between all panels. All joints should be filled with backing rod and caulking using a high quality sealant. Using specified sealant enables 3 point adhesion.

2.4 SEALANTS

Dow Corning 795 or CWS, one-part silicone, neutral-cure, architectural sealant or Bondaflex Sil 295 NB or Sil 199PG, one-part silicone neutral cure, architectural sealant. Colour as selected by the Architect from the manufacturer's chart

PART 3: EXECUTION

3.1 GENERAL

.1 All panels are to be installed level, true and plumb and in line as indicated on the drawings. Tolerances shall be within 2 mm. in 3 meters vertically and horizontally, and 3 mm. in 3 meters for the diagonal surface alignment.

.2 Panels required to be stored shall be protected from dirt and damage.
Keep panels covered at all times to protect from dirty rain water until on the project. Panels which are damaged in any way shall not be accepted or installed.

.3 Pre-drill exterior panels with #8 oversize, countersunk holes.

.4 Screws are to be located so that panels can be individually removed with out removing adjacent materials such as flashing.

.5 To maintain 1/4" gaps between panels use "Synstone Black Shims" prior to fastening. Remove before caulking.

.6 It is recommended that only installers approved by Synstone International Ltd. be allowed to install this system.

3.2 CLEAN UP

.1 Clean all panels periodically during the process of reaching substantial completion with approved methods in accordance with manufactures recommendations. Dust from cutting and drilling holes in panels must be removed immediately. Do not use wire brushes, metallic tools or abrasives .

.2 Upon completion of panel installation, remove any excess sealant with solvent approved or recommended by the panel manufacturer. Power wash the complete installation to remove construction dirt. No routine maintenance is required with Synstone panels. If required, the panels may be cleaned with mild detergent and water or plain water.

END OF SECTION 07 46 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. Manufactured with counterflashing.
2. Formed roof-drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.
4. Formed wall sheet metal fabrications.
5. Formed equipment support flashing.

B. Related Requirements:
1. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.
2. Section 079500 "Expansion Control" for manufactured sheet metal expansion-joint covers.

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 the 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 plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 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.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockup of typical roof edge and eaves, including gutter and fascia, including supporting construction cleats, seams, attachments, underlayment, and accessories.
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.

1.9 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.

1.10 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: **20** years from date of Substantial Completion.

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 METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with [**smooth, flat**] [**embossed**] surface.

1. Exposed Coil-Coated Finish: match siding panels for paint system and color
2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226**/**D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft minimum.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal **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 Aluminum Sheet: Aluminum or Series 300 stainless steel.
3. Fasteners for Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Solder:
1. For Zinc-Tin Alloy-Coated [**Stainless Steel**] [**Copper**]: ASTM B 32, 100 percent tin, with maximum lead content of 0.2 percent, as recommended by sheet metal manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

2.5 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.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

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. Rivet joints where necessary for strength.

J. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. **Rivet joints where necessary for strength.**

K. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.

1. Gutter Profile: See Drawings.
2. Gutters with Girth up to 15 Inches: Fabricate from the following materials:
   a. Aluminum: 0.032 inch thick.

B. Downspouts: Fabricate round downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.
1. Fabricate from the following materials:
   a. Aluminum: 0.024 inch.

C. 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 eyond cant or tapered strip into field of roof. Fabricate from the following materials:
1. Aluminum: 0.032 inch thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing **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. Joint Style: Overlapped, 4 inches wide.
2. Fabricate from the Following Materials:
   a. Aluminum: 0.050 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, Fasten and seal watertight.]

1. Coping Profile: See Drawings. [
2. Fabricate from the Following Materials:
   a. Aluminum: 0.050 inch thick.

C. Roof and Roof-to-Wall Transition.
1. Aluminum: 0.050 inch thick.

D. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
1. Aluminum: 0.040 inch thick.

E. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
1. Aluminum: 0.032 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 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

3.3 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.

1. Coat concealed side of **uncoated-aluminum** sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

D. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

E. Rivets: Rivet joints in [**uncoated aluminum**] [**zinc**] where necessary for strength.

3.4 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.

B. Hanging Gutters: Join sections with riveted and soldered joints. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.
2. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
4. Anchor gutter with straps 36 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
5. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.
6. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c.
2. Provide elbows at base of downspout to direct water away from building.
3. Connect downspouts to underground drainage system.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions,] and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. 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 at staggered 3-inch centers.

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. 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..

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.

B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

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 076200

SECTION 092216 - NON-STRUCTURAL 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. Non-load-bearing steel framing systems.

B. Related Requirements:

1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; roof rafters and ceiling joists; and roof trusses.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Studs and Runners: Provide documentation that framing members' certification is according to SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Horizontal Deflection: For wall assemblies, limited to 1/360 of the wall height based on horizontal loading of 10 lbf/sq. ft..

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G60, hot-dip galvanized unless otherwise indicated.

B. Studs and Runners: ASTM C 645. Use either steel studs and runners.

1. Steel Studs and Runners:

    a. Minimum Base-Metal Thickness: 20 gauge.
    b. Depth: As indicated on Drawings.

C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
    1. Minimum Base-Metal Thickness: As required for connector type and loads.

D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

    1. Minimum Base-Metal Thickness: 0.0329 inch.
    2. Depth: [7/8 inch or 1-1/2 inches.

E. Cold-Rolled Furring Channels: 0.053-inch galvanized thickness, with minimum 1/2-inch-wide flanges.

    1. Depth: As indicated on Drawings.

F. Z-Shaped Galvanized Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum thickness of 0.0179 inch and depth required to fit insulation thickness indicated.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

    1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide one of the following:

    1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.
    2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

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

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

E. Z-Shaped Furring Members:

1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.
2. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 09 96 00 – Protective Coatings

Part 1GENERAL

1.1 SECTION INCLUDES
- A. Architectural paint systems
- B. High performance atmospheric coating systems.
- C. Surface preparation requirements.
- D. Schedule of project specific work to be completed by contractor.

1.2 DEFINITIONS
- A. Contractor is the party or persons directly contracted or subcontracted through a third party to perform the work described herein.
- B. Owner is the facility owner or owner's representative.
- C. Manufacturer is the materials supplier.

1.3 REFERENCES
- A. Air Quality Management Districts
  1. Bay Area Air Quality Management District (BAAQMD)
- B. ASTM International (ASTM)
  1. D16 – Standard Terminology for Paint, Related Coatings, Materials, and Applications
  2. D4258, Standard Practice for Surface Cleaning Concrete for Coating
  3. D4259, Standard Practice for Abrading Concrete
  4. D4541, Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers.
  5. D 7091 - Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals.
- C. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. NACE International (NACE)
  1. SP0188-06 – Discontinuity (Holiday) Testing of Protective Coatings
- E. National Association of Pipe Fabricators (NAPF)
  1. 500-03-04 Abrasive Blast Cleaning for Ductile Iron Pipe
  2. 500-03-04 Abrasive Blast Cleaning for Ductile Iron Fittings
- F. The Society for Protective Coatings (SSPC)
  1. SSPC-SP 1 - Solvent Cleaning.
  2. SSPC-SP 2 - Hand Tool Cleaning.
  3. SSPC-SP 3 - Power Tool Cleaning.
  4. SSPC-SP 5 / NACE 1 – White Metal Blast Cleaning
  5. SSPC-SP 6 / NACE 3 – Commercial Blast Cleaning
  6. SSPC-SP 7 – Brush off Blast Cleaning
  7. SSPC-SP 10 / NACE 2 – Near White Metal Blast Cleaning
  8. SSPC-SP 11 – Machine Tool Cleaning to Bare Metal
  9. SPSC-SP 12 / NACE 5 – Waterjet Cleaning
  10. SSPC-SP 13 / NACE 6 - Surface Preparation for Concrete.
  11. SSPC-SP 14 / NACE 8 - Industrial Blast Cleaning
  12. SSPC-SP 15 – Commercial Grade Power Tool Cleaning
  13. SSPC-SP 16 – Brush off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non Ferrous Metals.
  14. SSPC-SP WJ-1 / NACE WJ-1 Clean to Bare Substrate
  15. SSPC-SP WJ-2 / NACE WJ-2 Very Thorough Cleaning
  16. SSPC-SP WJ-3 / NACE WJ-3 Thorough Cleaning
  17. SSPC-SP WJ-4 / NACE WJ-4 Light Cleaning
  18. SSPC-PA1 – Best Practices for Paints and Coatings Application
  19. SSPC-PA2 – Measurement of Dry Coating Thickness with Magnetic Gauges

20. SSPC-PA71 – Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements

G. US Environmental Agency (EPA)
1. Method 24 – Surface Coatings

1.4 QUALIFICATIONS

A. Coating manufacturer's authorized representative shall provide written statement attesting that the applicator has been instructed on proper preparation, mixing and application procedures for coatings specified.
B. Applicators shall have a minimum of 5 years experience in application of similar products on similar project.
1. Contractor shall possess a valid state license as required for performance of the painting and coating work called for in this specification.
2. Provide references for minimum of three different projects completed in last five years with similar scope of work.
a. Include name and address of project, size, and scope of work.
C. Applicators shall possess current SSPC-QP1 and QP2 certifications as required by the owner / engineer.

1.5 SUBMITTALS

A. Submit all required documentation noted herein and under provisions of Section 01 33 00, Submittal Procedures.
B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
1. Colors available for each product (where applicable)
2. Product characteristics and coating manufacturer's guidelines and recommendations for surface preparation, painting, drying, curing, handling, shipping, and storage of painted structural steel
3. Surface preparation requirements.
4. Storage and handling requirements and recommendations
5. Application methods
6. VOC compliance
7. MSDS
C. Contractor Work Plan
1. In general, the contractor shall supply the owner or engineer's representative with a plan of work. The work plan should detail but is not limited to the following items.
2. Proposed methods of containment, collection, and disposal of related debris, rinse water, or trash.
3. Proposed surface preparation standards and methods to achieve standard for each space or substrate identified on the plans, drawings, or finish schedule.
4. Proposed coating system for each space or substrate identified on the plans.
a. Confirmation of compatibility for shop and field applied coatings. (where applicable)
5. Proposed methods and equipment to be used for paint application.
6. Proposed methods for maintaining proper environmental conditions during surface preparation, application, and curing cycles of the coating materials.
7. Proposed methods and job safety analysis procedures for maintaining a clean, safe and secure jobsite during work activity.
8. Proposed methods to protect coating during curing, shipping, handling, and storage.
9. Proposed methods for storing materials.
10. Proposed methods and examples of daily reports of contractor work progress.
11. Potential hazards and mitigation, work processes, scheduling conflicts or other planning items which would hinder successful and timely completion of the project.
D. Selection Samples: Submit a complete set of color chips that represent the full range of manufactures color samples available.
E. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.
F. Mock Up Samples
1. Include a mock-up if the project size and/or quality warrant taking such a precaution.

a. Sample of paint, finishes, and other coating materials shall be submitted on 8.5 x 11 inch sheet metal. Each sheet shall be completely coated over its entire surface with one protective coating material, type, and color.
b. Two sets of color samples to match each color selected by the engineer from the manufacturer's standard color sheets. If custom mixed colors are indicated, the color samples shall be made using color formulations prepared to match the color samples furnished by the engineer. The color formula shall be shown on the back of each color sample.

2. Finish area designated by Architect.
3. Provide samples that designate prime & finish coats.
4. Do not proceed with remaining work until the Architect approves the mock-up samples.

1.6 QUALITY ASSURANCE

A. Quality assurance procedures and practices shall be at the discretion of the engineer or owner. It provides oversight of quality control and monitoring of all phases of the installation process including but not limited to surface preparation and application and curing of coatings.
   1. Requirements for acceptable quality control methods shall be defined by the owner or engineer.
   2. Procedures or practices for quality control practices not specifically defined in this Section may be utilized, provided they meet recognized and acceptable professional standards and are accepted by the engineer or owner's representative.
   3. Arrange for coating manufacturer's representative to attend preconstruction conferences and make periodic visits at the construction site to provide consultation services during surface preparation work and application of coatings.
   4. Quality assurance activities may be performed by a third party inspection firm contracted by the owner or specifying engineer on their behalf at any time during the project.

B. Pre-Installation Conference
   1. The contractor, the installation sub-contractor, and the painting system manufacturer's representative shall meet on site with the owner's representative. Particular emphasis shall be placed on these specification requirements, safety, weather conditions, surface preparation, material application, and inspection.
   2. The contractor shall submit to the owner's representative any revisions or changes agreed upon, reasons thereof, and parties agreeing or disagreeing with them.

C. Surface Preparation: Preparation of all surfaces and application of coatings specified in this section shall be in strict accordance with coating manufacturer's instructions as supplemented by these specifications.

D. Coating Application: Apply coatings in strict accordance with manufacturer's material data sheets with particular attention to curing and drying times and temperatures.

E. Inspection of Dry Film: Contractor shall provide inspection of the applied materials. Thickness of coatings shall be checked with a nondestructive, magnetic-type thickness gauge.
   1. Ensure all dry film thickness requirements as specified have been met. DFT readings shall be performed at or above the frequency specified in SSPC-PA2. Meet the minimum requirements for SSPC-PA2.
   2. Use an instrument such as a Tooke Gauge if a destructive tester is deemed necessary.
   3. Test coating integrity of all surfaces with an approved inspection device.
   4. Holiday detection testing: Shall be accomplished over 100 percent of coated surfaces, and in strict accordance with NACE SP0188.
      a. For "high voltage" holiday inspection equipment used to inspect film thickness between 20 -50 mils adjusted voltage shall not exceed voltage recommended by manufacturer of coating system.
      b. For "wet sponge" holiday inspection equipment used to inspect film thickness between 8 and 19 mils, add a non-sudsing type wetting agent to water prior to wetting detector sponge.
   5. No pinholes or other irregularities will be permitted in final coating.

F. Inspection Testing Devices: Contractor shall provide following properly calibrated testing devices to be jointly used on this project by the contractor and engineer. Devices shall remain property of contractor during and after project.
   1. Surface profile Comparator or Testex Tape to measure surface profile prior to coating application.
   2. Psychrometer and psychometric tables or charts for humidity/dew point determination

3. Dry film thickness gauge and calibration blocks for coating thickness testing.
4. Wet film thickness gauge for coating thickness testing.
5. 10 times magnifier for examination
6. Holiday detector and associated equipment for coating defect determination.
7. Combustible gas analyzer (sniffer) for safety.

G. Documentation: Contractor shall provide daily reports of all contractor activity on site to the engineer on the Friday, end of work week, for the previous week activity.
1. Document sample shall be approved by the engineer prior to reporting.
2. All documentation shall be delivered electronically to the engineer upon completion of the project.
3. Documentation should be consistent with inspection reports utilized by NACE certified inspectors.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufactures name, label, and the following list of information:
1. Product name, type (description)
2. Application & use instructions
3. Surface preparation
4. VOC content: for two component products, provide mixed VOC in g/L
5. Environmental issues
6. Batch date
7. Color number

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
1. Store materials in an area that is within the acceptable temperature range, per manufacturer’s instructions. Protect from freezing.

C. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions during surface preparation, application, and curing of installed coating system.
1. Temperature, humidity, and ventilation must be within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

B. Dehumidification and heating for coating of immersion environments shall be effectively designed and used when needed to maintain proper environmental conditions for proper surface preparation, coatings application, and curing of the installed coating.
1. Confirm site electrical power source availability prior to bidding of project. If on site power is not available, provide internal combustion engine generators of sufficient power for the dehumidification / heating equipment.

C. Heating equipment including electric, indirect combustion, indirect fired, or steam coil methods may be used.
1. Direct fired propane heaters shall not be used during surface preparation, application and curing of the coating.
2. Heating equipment shall be intrinsically safe or deemed safe by safety personnel prior to use on the job site.

D. Substrate moisture content shall be below manufacturer’s recommendation for each substrate to be coated.

1.9 WARRANTY

A. Inspection
1. An inspection may be conducted during the eleventh month following completions of the coating work. The contractor and a representative of the coating material manufacturer shall attend this inspection. Defective work shall be repaired in accordance with these specifications and to the satisfaction of the Owner. The owner may, by written notice to the contractor, reschedule the inspection to another date within the one year correction period or may cancel the inspection altogether. The contractor is not relieved of its responsibilities to correct defects.

Part 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: The Sherwin-Williams Company,101 Prospect Avenue NW, Cleveland, OH 44115, www.sherwin-williams.com
B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Product Requirements.
C. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2.2 APPROVED PRODUCTS

A. Submit products as specified herein.
B. To establish equality, the contractor shall furnish satisfactory documentation from the manufacturer of the proposed substitute or "or-equal" product that the material meets the indicated requirements and is equivalent or better in the following properties.
   1. Quality
   2. Durability
   3. Resistance to abrasion, impact, or physical damage
   4. Life expectancy
   5. Ability to recoat in the future
   6. Solids content by volume
   7. Dry film thickness per coat
   8. Compatibility with other coatings
   9. Suitability for the intended service
   10. Resistance to chemical attack
   11. Temperature limitations during application and in service
   12. Comparable performance test results.
C. Protective coating materials shall be standard products produced by recognized manufacturers who are regularly engaged in production of such materials for essentially identical service conditions. When requested, the contractor shall provide the engineer with the names of not less than ten successful applications of the proposed manufacturer's products that comply with these requirements.
D. Standard approved painting, coating, and lining systems are defined herein. Apply approved systems according to the finish schedule.

2.3 PRIMERS, NON FERROUS OR FERROUS METALS, FIELD OR SHOP APPLIED

A. P1: Organic Zinc Rich Primer
   1. Minimum total film thickness, 3 mils DFT with use of polysiloxane finish.
   2. Use zinc primer as primer for ferrous metal substrates as specified for structural steel as noted on the plans. Prepare surfaces per SSPC-SP6 and apply to all surfaces including bolted connection areas where Class B Slip is required.
   3. Zinc primer shall meet Class B Slip requirements and be applied within the specified tolerances of the product's Class B certification results.
   4. Prime Coat, 3 - 5 mils DFT: SW Zinc Clad 4100, B69

B. P2: Epoxy Primer
   1. Minimum total film thickness, 4 mils DFT with use polysiloxane finish.
   2. Use epoxy primer for new equipment and and non ferrous metal substrates where specified.
   3. Prime Coat, Minimum 4 mils DFT: Macropoxy 646,B58;

2.4 FINISHES FOR EXPOSED ATMOSPHERIC HIGH PERFORMANCE F COATING SYSTEMS

A. F1: Polysiloxane Finish (Gloss)
   1. Minimum total film thickness, 4 mils DFT

2. Spot prime all exposed substrates with the designated new substrate primer, apply prime, intermediate and finish coat to all surfaces.
3. Finish, 4 - 6 mils DFT: SW Sherloxane 800, B80 Series

Part 3 EXECUTION

3.1 SCOPE

A. General Surfaces to be Painted:
   1. All galvanized surfaces associated with the pedestrian bridge and stair ramp tower shall be prepared and coated with HP1 epoxy, polysiloxane coating system.
   2. All ferrous metal substrates associated with the pedestrian bridge and stair ramp tower shall be prepared and coated with HP2 epoxy zinc rich, polysiloxane coating system.
   3. All miscellaneous surfaces shall be prepared and coated with HP1 epoxy, polysiloxane coating system.

B. General Surfaces not to be Painted:
   1. Concrete, unless required by items on the concrete coating schedule below or the drawings.
   2. Electrical panels when not adjacent to a painted surface.
   3. Equipment nameplates.
   4. Machined surfaces.
   5. Platform gratings, stair treads, door thresholds, and other walk surfaces, unless specifically indicated to be coated.
   6. Stainless steel items.
   7. Prefinished metal such as Kynar coated.

3.2 EXAMINATION

A. Examine all substrates and conditions, with contractor, engineering representative present for compliance with requirements for maximum moisture content, surface soundness, and other conditions affecting the performance of the Work.

B. Do not begin application of coatings until substrates have been properly prepared, examined, and conditions properly reported. Notify Architect of unsatisfactory conditions or areas where specified surface preparation or material application cannot be achieved.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions. Beginning coating application constitutes contractors acceptance of substrate and conditions.

D. Identify all shop primed items and provide field performed preparation and application procedures for review and approval.

3.3 SURFACE PREPARATION:

A. General:
   1. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
      a. Remove incompatible primers and prime substrate with compatible primers or apply a tie coat as required to product the coating system indicated.
      b. Previously coated, existing surfaces shall be identified and existing coating type confirmed. In the event that the existing coating cannot be confirmed consult with the manufacturer and submit tie coat alternative solutions.
   2. Follow all surface preparation guidelines for new construction. In the event of a discrepancy consider the more effective surface preparation as the default method.
   3. Verify that the atmospheric conditions are within the acceptable temperature, humidity and sun exposure limits.
      a. Dehumidification must be utilized in the event that atmospheric conditions cannot be maintained.
   4. Adhere to manufacturer’s recoat time surface preparation requirements.

a. Surfaces exhibiting rust bloom, moisture weeping, or any other deleterious condition shall be sufficient repaired prior to the application of coating. Repair methods include necessary mean to meet original specification requirements, including abrasive blasting as needed.

5. Remove any residual dusting or light surface contamination from prepared surfaces prior to the application of the coating system.
6. Protect all surfaces not being coated from any damage due to surface preparation work process.
7. Paint all inaccessible items before being assembled.
8. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
9. Install coating systems to only properly prepared surfaces.

B. Abrasive Blast Cleaning
1. Blast cleaned surfaces shall match the standard samples available from the NACE Standard TM-01-70, Visual Standard for Surfaces of New Steel Air Blast Cleaned with Sand Abrasive and TM-01-75, Visual Standard for Surfaces of New Steel Centrifugally Blast Cleaned with Steel Grit.
2. Remove all oil, grease, welding fluxes, and other surface contaminants by solvent cleaning per SSPC-SP1prior to any mechanical surface preparation.
3. Sharp edges shall be rounded or chamfered, and burrs and surface defects and weld splatter shall be ground smooth prior to blast cleaning in accordance with NACE SP0178-07, Design, Fabrication, and surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.
4. The type and size of abrasive shall be selected to produce a surface profile that meets the coating manufacturer's recommendation of the particular product and service conditions. Abrasives for submerged and severe service coating systems shall be clean, hard, sharp cutting crushed slag. Metal shot or grit shall not be used for surfaces in submerged services.
5. Abrasive shall not be reused unless an automated lasting system is used for surfaces that will be in non-submerged service. For automated blasting systems, clean, oil free abrasives shall be maintained. The abrasive mix shall include at least 50 percent grit.
6. Compressed air for blast cleaning shall be supplied at adequate pressure from well-maintained compressors equipped with oil and moisture separators that remove at least 98% of the contaminates.

C. Ferrous Metal Surface Preparation
1. Structural Steel Columns, Joists, Beams: New
   a. Clean in accordance with SSPC-SP1, Solvent Cleaning.
   b. Abrasive blast clean all surfaces per SSPC-SP6 to achieve a 1.5 – 2 mil profile.
   c. Blast clean all faying metal surface connections including interior of bolt hole assemblies. Where blast cleaning is not possible mechanically clean surfaces per SSPC-SP11 to impart a surface profile and remove corrosion.
2. Apply primer to blasted substrate using the most stringent method, within 4 hours of blast cleaning or prior to rust blooming.

D. Galvanized Metal Bolt Assembly
1. Clean surfaces with etching cleanser or mechanical scarification to remove temporary passivation layers and create sufficient profile for metal primers.
2. Confirm removal of all temporary passivation layers using copper sulfate solution and the methods defined in SSPC-SP16.
3. If temporary passivation layer remain intact, remove using consistent abrading with sandpaper, scotch brite pads, or abrasive brush blasting per SSPC-SP-16.

E. Galvanized Metal Surface Preparation
1. Clean surfaces using abrasive brush blast cleaning per SSPC-SP16 to remove temporary passivation layers and create sufficient profile for metal primers. Surface profile to meet 0..75 – 1.5 mil profile.
2. Confirm removal of all temporary passivation layers using copper sulfate solution and the methods defined in SSPC-SP16.

F. Non-Ferrous, Aluminum, Stainless Steel Surface Preparation

1. Clean surfaces with biodegradable removing cleanser to remove oxidation layer from surface per SSPC-SP1.
2. Abrade surfaces complete with 200 grit sandpaper.

G. Shop Primed Surfaces Surface Preparation for Field Applied Finishes
1. All shop primed shall be prepared according to following requirements.
2. Clean all previously coated surfaces to remove dirt, greases, solutions, and any foreign contaminants per SSPC-SP1.Cleaning agent shall be biodegradable, highly concentrated, water reducible, alkaline detergent blend. Cleaned surfaces shall be properly rinsed to remove all cleaners and contaminants.
3. Shop applied primers shall be abraded as needed following cleaning per SSPC-SP1. Overcoating of shop applied epoxy primers shall be within the shop applied manufacturers published recoat parameters. Provide written confirmation of compatibility, timing, and procedure for over coating from manufacturer. Where maximum recoat windows have been exceeded, existing shop primers shall be completely and thoroughly abraded prior to application of coating systems.
4. Exposed or corroded substrates shall be mechanically cleaned to remove all corrosion or deteriorated material. Surface preparation requirements of corresponding deteriorated exposed substrate shall be achieved according to original substrate surface preparation for architectural or high performance coatings.
5. Sand and feather edge a smooth transition from existing coatings and exposed substrate such that damaged area are not visible from a distance of two (2) feet.
6. Final surface preparation for existing coatings and deteriorated substrates shall provide intact, tightly adherent coatings, cleaned substrate, dull, and dry.
7. Prime coat used in over coating existing material must be suitable for the intended use and provide adequate adhesion to the existing material.
8. Over coating existing coating systems for immersion or submerged conditions shall be made in strict accordance with the coating manufacturer's printed instructions. Coating manufacturer will provide in writing specific steps required to achieve proper adhesion and performance of overcoat system.

3.4 INSTALLATION

A. General Requirements
1. Apply all coatings and materials with manufacture specifications in mind. Apply coatings by brush, roller, or spray equipment unless otherwise directed by the manufacturer.
2. Mix and thin coatings according to manufacture recommendation.
3. Do not apply to wet or damp surfaces.
4. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen in accordance with SSPC-PA1.Regardless of number of coats specified, apply as many coats as necessary for complete hide, uniform appearance, and achieving the required dry film thickness. Final film of coatings shall have no visible, drips, overspray, dry spray, runs, ridges, sags, holidays, dry lap or brush marks.
5. Inspection: The coated surface must be inspected and approved by the architect or engineer.
6. Stripe coats shall be applied to all welds, edges, nuts, bolts, difficult to reach areas.
   a. Stripe coats shall be applied directly to properly prepared surface prior to spray application of primers.
   b. Stripe coats shall also be applied directly to primed surface prior to spray application of the intermediate coats for multi-coat immersion or submerged applications.
   c. Stripe coat material shall be the same or separately approved material compatible with the material used for spray application of any given coat.
7. Spray application shall be performed when conditions, environments, and permitting allow.
   a. Use only spray equipment approved by the manufacturer for the specific coat of material.
8. Multiple coat applications shall be installed according to the manufacturers printed requirements.
   a. Coats of material shall be sufficiently dry prior to the application of a subsequent coat in a coating system.
   b. Do not allow excessive drying time to pass which will inhibit or reduce the inter-coat adhesion of the multiple coat system.
   c. If recoat requirements have been exceeded, brush blast or scarify prior coat according to the manufacturers requirement. Provide written confirmation of repair process from manufacturer.

d. Remove any dust or foreign contamination from previous coat prior to applying the next coat in a multi coat system.

9. Apply no coating when surrounding air temperature of surface to be coated is below minimum temperature allowed by manufacturer's recommendations for coating application or when it is expected that air temperature will drop below minimum 8 hours after coating application.
10. Apply no coating when surrounding air temperature is forecasted to be less than 5 degrees Fahrenheit above dew point within 8 hours after coating application.
11. Apply no coating to steel which is 5 degrees Fahrenheit below air temperature or which is at a temperature over 115 degrees Fahrenheit, nor shall coating be applied to steel which is at a temperature that will cause blistering or porosity or otherwise will be detrimental to the life of the coating.
12. No coating shall be applied to wet or damp surfaces or in rain, snow, fog, or mist. Coating shall not be applied on frosted or ice-coated surfaces.
13. Dew point shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychometric Tables or equivalent..
14. The coated surface must be inspected after application of individual coats within the multi coat system and after completion of the system. Applied systems must be approved by the architect or engineer.

B. Curing Requirements
1. Maintain adequate environmental conditions and ventilation during drying and curing of applied coating systems.
2. Allow all primer and intermediate coats to sufficiently dry prior to the application of subsequent coat of material.
3. Coating systems to be placed into immersion service shall cure under the proper conditions as stated by the manufacturer for the full curing time requirement. Deviations from the proper conditions shall be quickly resolved by the contractor and the methods used shall be confirmed by the manufacturer.
4. All applied coatings shall be properly and completely cured prior to being place into their intended service.

C. Shop Application
1. All structural steel members, steel plate, or other manufactured items may be prepared and coated in a fixed location.
2. Shop application of prime coat shall be completed only when specified surface preparation has been achieve for the substrate. Apply all primers within 4 hours of completion of surface preparation. Ferrous metal shall not be primed if rust bloom is present.
   a. Prime properly prepared interior of bolt holes with specified epoxy zinc rich primer.
3. Field repair any damaged shop primer, intermediate or finish coats in accordance with the preparation requirements for the given substrate. Apply repair primer, intermediate, and finish coats as required to replace damage materials and restore damaged areas equal to surface before damage.
4. Equipment and Constructed Materials
   a. Unless otherwise indicated, items of equipment or parts of equipment which are not submerged in service shall be shop primed and the finish coated in the field after installation with the indicated or selected color. The methods, materials, application equipment, and other details of shop painting shall comply with this section. If the shop primer requires top coating within in a specific period of time, the equipment shall be finish coated in the shop and then touched up after installation.
   b. For certain pieces of equipment it may be undesirable or impractical to apply finish coatings in the field. Such equipment may include equipment such as electrical control panels, switchgear or main control boards, ferrous metal passages in valves, or other items where it is not possible to obtain the indicated quality in the field. Such equipment shall be primed and finish-coated in the shop and touched up in the field with the identical material after installation. The contractor shall require the manufacturer of each such piece of equipment to certify as part of its Shop Drawings that the surface preparation is in accordance with these specifications. The coating material data sheet shall be submitted with the Shop Drawings for the equipment.

c. For certain small pieces of equipment the manufacturer may have a standard coating system that is suitable for the intended service conditions. In such cases, the final determination of suitability will be made during review of the Shop Drawing submittals. Equipment of this type generally includes only indoor equipment such as instruments, small compressors, and chemical metering pumps.
d. Shop painted surfaces shall be protected during shipment and handling by suitable provisions including padding, blocking, and the use of canvas or nylon slings. Primed surfaces shall not be exposed to the weather for more than 2 months before being top coated or less time if recommended by the coating manufacturer.

D. Prime Coat Application:
1. Prime all surfaces to be painted.
2. Prime and finish all surfaces that will be inaccessible after installation.
3. Where applicable, protect faying metal connection areas and bolted assemblies from finish coat application until final assembly is complete.
4. Primed substrate shall be of consistent film thickness and coverage to meet the specification.
5. Provide proper environmental conditions for curing of prime coat.

E. Finish Coat Application:
1. Apply all intermediate and finish coats to properly primed substrates within the recoat requirements and according to the product data sheet of the manufacturer.
2. Apply contrasting colors for distinguishing between intermediate and finish coats.
3. Field applied intermediate and finish coats shall be applied to shop primed substrates only within sufficient adhesion can be obtained. When required, thoroughly and completely abrade existing primers and apply a subsequent tie coat of approved primer will be applied to the abraded shop primer.

3.5 QUALITY CONTROL

A. In general the contractor will perform appropriate and measurable quality control activities that ensure a successful installation of the coating systems.
B. Measure all dry film thickness readings as defined in SSPC-PA2
C. Apply all coatings using methods defined in SSPC-PA1.
D. Perform all stripe coating using methods defined in SSPC-PA 11.
E. Maintain and provide to engineer copies of daily records of contractor activity while performing work on the project. Daily record information should include but is not limited to the following.
1. Site foreman responsible for day’s activities.
2. Work hours. Start and finish times
3. Crew members
4. Atmospheric measurements during exterior work should include evenly sequenced measurements of general weather condition, wind speed, air temperature, and relative humidity.
5. Atmospheric measurements during high performance coating application particularly submerged or immersion items/ work should include evenly sequenced measurements of general weather condition, wind speed, air temperature, and relative humidity during all surface preparation, application, and curing of applied systems.
6. Substrate temperatures at the time of application and completion of the application.
7. Measure wet film of applied coating using wet film thickness gauges.
8. Detailed record of start and finish times of activities performed on a given space.

F. Maintain accurate quality control records of applied coating systems.
1. Record accurate dry film thickness readings in accordance with SSPC-PA 2.

G. Supply daily reports on a timely basis to the supervising Engineer.

3.6 PROTECTION

A. Protect finished coatings from damage until completion of project.
1. Applied coatings shall not be placed into service until properly cured.
2. Maintain acceptable environmental conditions for proper curing of the applied coating system.

B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

3.7 SCHEDULE OF PAINTED SURFACES

A. General:
   1. All substrates shall require finish painting unless specifically noted otherwise.
B. Color
   1. Color schemes shall be provided to the contractor by the owner.
C. Project Specific Work Schedule:
   1. Specific schedule of work to be completed by contractor shall be noted in the Table found in Appendix A

Appendix A – Schedule of Work

Area	Description	Prime	Finish
Bridge, New Ferrous Metal	New structural steel. Where applicable, protect primed faying metal connection areas and bolted assemblies from finish coat application until final assembly is complete.	P1	F1
Bridge, New Galvanized Metal	New surfaces including field applied bolt assemblies.	P2	F1

Notes	Description
Application Procedure	Preferred method of application includes shop priming of all surfaces and field application of spot primers and finish coat.

SECTION 16 10 00 ELECTRICAL GENERAL

PART I - GENERAL

Drawings and General Provisions of the Contract, including General Conditions, Supplementary Conditions, and Division 1 of the Specifications apply to the work of this section and are hereby incorporated by reference as if repeated herein.

1.1 SCOPE

A. Provide all labor, materials, tools, transportation, equipment, services and facilities required for the complete, proper and substantial installation of all electrical work shown on the Plans and/or outlined in these Specifications. Include all hangers, anchors and supports for fixtures. Work shall include all materials, appliances and apparatus not specifically mentioned herein or noted on the Plans but necessary to make a complete working installation of all electrical systems shown or described herein.

B. Do all cutting, patching, repairing necessary for the proper installation of work and repair any damage done, coordinating this work with that of other crafts.

C. Do all excavating and backfilling in connection with electrical work. Backfill in approximately 8” layers, recompacted to 90% relative density. Restore all disturbed surfaces to original condition properly installed to eliminate any settlement.

D. Contractor shall be held to have examined the site and compared it with the Specifications and Plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowances shall be made for any extra expense due to failure to make such examination.

1.2 CODES, RULES AND REGULATIONS

A. All work and materials shall be in full accordance with the latest adopted versions of the following: National Electrical Code with CA amendments, UBC with CA amendments, UMC with CA amendments, UFC with CA amendments, CAL/OSHA Low Voltage Electrical Safety Orders, NFPA 72 National Fire Alarm Code, NECA National Electrical Installation Standards (NEIS), and all applicable local laws and regulations. Where compliance with Title 24 Part 3 or any other handicap codes is required all receptacles, telephone, data, etc. outlet boxes are to be mounted at +18" to top of box UON. All switch, fire alarm manual stations, thermostats and other controls at +48" to top of outlet box UON. All receptacles, switches, etc. above countertops at +46" to top of outlet box UON. All fire alarm horns +90" fire alarm strobes and horn / strobes +84" to top of outlet boxes. All measurements are from finished floor.

1.2 CODES, RULES AND REGULATIONS (CONTINUED)

B. When Specifications or Drawings call for materials or construction of a better quality or larger size than required by the above mentioned rules and regulations, the provisions of the Specifications shall take precedence.

C. Should there by any direct conflict between the above mentioned rules and these Specifications, the rules shall govern. Nothing in these plans and specifications are to be construed to permit work not conforming to any codes.

D. Furnish without extra charge any additional materials and labor which may be required for compliance with these laws, rules and regulations even though work is not mentioned in these Specifications or shown on the Plans.

1.3 PERMITS, FEES AND UTILITY CHARGES

A. Contractor shall pay all inspection and other applicable fees and procure all licenses and permits necessary to the prosecution and completion of his work.

B. Utility Company charges shall be paid for by the Owner.

1.4 TEMPORARY CONSTRUCTION POWER

A. Contractor shall make all arrangements and provide all necessary facilities for temporary construction power at site. Energy costs for construction power shall be paid for by the Owner.

1.5 PROTECTION

A. Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. Provide for the safety and good condition of all work until final acceptance of the work by the Owner and replace all damaged or defective work, materials and equipment before requesting final acceptance.

1.6 SAFETY PRECAUTIONS

A. Provide and maintain throughout the work adequate safeguards, including barriers, warning signs, enclosures and lights to prevent accidental injury to persons or damage to property.

1.7 DRAWINGS

A. The general arrangement of outlets and equipment, as shown on the Plans is diagrammatic and approximately correct as to locations. The Contractor shall make minor changes because of structural conditions and Owners convenience at no cost to the Owner. The Contractor shall be responsible for accurate location of all outlets,

etc. with respect to the work of others.**1.7**

B. No extras will be allowed on account of moving work under this section to avoid interference with work of other contractors.

C. Verify all measurements at building, be responsible for correctness of same. No extra compensation will be allowed because of difference between work shown on Drawings and measurements of building.

D. Data given herein and on Drawings are as exact as could be secured, but their absolute accuracy cannot be guaranteed. Drawings and Specifications are for assistance and guidance only, exact locations, distances, levels, etc., shall be governed by the building. Contractor shall use same with this understanding. Exact location of all outlets and light fixtures shall be approved by the Architect prior to rough-in.

1.8 AS-BUILT DRAWINGS

A. Provide as-built drawings on a new blackline set of plans after substantial completion but before Architect's acceptance of the work. The drawings shall be certified to be correct by the Contractor preparing them.

B. This data shall include exact sizes, locations and dimensions of all buried or concealed conduit and equipment and the exact location of all service equipment, panelboards and control equipment.

1.9 MATERIALS

A. All materials and equipment shall be furnished as specified in strict accordance with these Plans and Specifications; and shall be new, listed by Underwriters Laboratories and meeting their requirements and bearing their labels wherever standards have been established and label service is regularly furnished by that agency.

B. In addition, all proposed substitutions must be:

1. Submitted within ten (10) calendar days before bids are submitted.
2. Proven to the Architect and Engineer to be equal or superior to the specified item in all respects. Architect's decision is final.
3. Accompanied by shop drawings and/or complete descriptive information of both the specified item and the proposed substitution.

C. All dimensional or electrical changes, or changes to their work which are required by or are a result of, an acceptable electrical substitution shall be the sole and complete responsibility of the Electrical Contractor and shall be made at no additional cost to the Owner.

1.9 MATERIALS (CONTINUED)

D. Contractor shall make no substitutions of materials or equipment without approval of the Architect.

E. Prior approval on proposed substitutions will not be given during bidding.

1.10 APPROVAL OF MATERIALS

A. Within twenty (20) calendar days after award of Contract, before any materials are purchased, brought to the site or installed, Contractor shall submit to the Architect / Engineer six (6) copies of the following materials and equipment:

1. Lighting Inverter.
2. Lighting Fixtures.
3. Conduit, Straps, Supports, Etc.
4. Complete list of wiring devices, cover plates, disc. switches, starters, etc.
5. Concrete Pullboxes.
6. Lighting Controls.

B. Submittals shall include catalog numbers, shop drawings and other descriptive data as may be required and shall be bound together in 3 ring binders. Each copy of the submittal shall include the following:

1. 4" x 5" descriptive label on cover with project name, date, number and title of specification section and names and addresses of architect, contractor, subcontractor, & supplier.
2. Table of contents.
3. Fixture identification letters and panel identification letters etc.
4. Index tabs for the separate submittal sections as listed in par. A above.

C. Panelboard submittals shall include charts showing branch breaker arrangements. Such arrangement shall be the same as those indicated in the panelboard schedule on the Drawings.

D. Switchboard, lighting, light control, and fire alarm submittals shall include shop drawings. Prior to fabrication of main switchboard, Switchboard Mfg. shall submit a minimum of two copies of switchboard submittal to PG&E for their approval.

E. Install no equipment or materials without the Architect’s approval. Architect may direct that any unapproved materials and/or equipment be removed and replaced with items selected by him without change in contract price.

1.11 SUPERVISION AND WORKMANSHIP

A. The Contractor shall be a State of California C-10 licensed electrical contractor and personally, or through an authorized and competent representative, constantly supervise the work covered by these Specifications and, insofar as possible, keep same foreman and workmen on the job from start to finish.

B. All equipment and material shall be installed in a neat and workmanlike manner in accordance with NECA Standard of Installation manual and workmanship of entire job shall be first class in every way.

1.12 COOPERATION WITH OTHER TRADES

A. Cooperate with other Contractors doing work on building as may be necessary for proper execution of work of various trades employed in construction of the building. Refer to Architectural, Structural, Mechanical and Plumbing drawings for construction details and coordinate work with that of the other Contractors.

1.13 STRUCTURAL CONDITIONS

A. Notching and boring of structural members must be held to an absolute minimum. Lay out the work and obtain the approval of the Architect for the necessary holes and notches before proceeding with the installation. Where notches and holes are approved, they shall be carefully held to the sizes actually required.

1.14 INSPECTION

A. All work and materials covered by this Specification shall be subject to inspection at any and all times by representatives of the Architect.

B. If Architect or Owner's inspector finds that any material does not conform with the Contract Documents, this Contractor shall, promptly remove said materials from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by this Contractor.

C. A final inspection will be performed at the completion of the project upon notification by the contractor. A punch list will be generated after this inspection and a follow up punch list inspection will be done when notified by the contractor that the project is 100% completed. Any further inspections due to incomplete work after the two initial inspections will be billed to the contractor at our standard hourly rate.

1.15 TESTING

A. Upon completion of work and adjustment of all equipment, all systems shall be tested under direction of Architect to demonstrate that all equipment furnished, installed and/or connected under provisions of these Specifications shall function electrically in the manner required.

B. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the NEC. All circuits shall be tested for proper neutral connections.

C. Electrical Contractor shall furnish all temporary wiring, equipment and labor required for tests and shall remove and replace all defective workmanship and/or materials at no expense to Owner.

D. Electrical Contractor shall provide all testing, forms, etc. per Title 24 for commissioning of the Indoor and Outdoor Lighting Systems. This includes Occupancy Sensor Acceptance, Manual Daylight Controls Acceptance, Automatic Time Switch Control Acceptance

1.16 CLEAN-UP

A. At completion of work, this Contractor shall clean up and remove all debris and materials not installed in work, leaving premises clean.

1.17 GUARANTEE

A. Contractor shall leave the entire electrical system in proper working order. Any item of material, apparatus, or workmanship supplied by the Contractor showing defects of design, construction, or quality within one (1) year of final acceptance by the Architect shall be replaced by such new material, apparatus, or parts as may be found necessary to make such defective portion of the complete system conform to the true intent and meaning of the Plans and Specifications. Changes, repairs and replacements made during the warranty period shall be made by the Contractor at no cost to the Owner. Contractor is not required to guarantee any lamps after final acceptance of the building by the Architect. See Division 1 of these specifications for additional information.

1.18 OPERATION AND MAINTENANCE MANUALS

A. Two copies of operation and maintenance manuals shall be submitted to the architect as a part of project close out. These manuals shall be compiled with a table of contents and index tabs in three ring vinyl covered binders with a descriptive label on front cover. See Division 1 of these specifications for additional information.

1.18 OPERATION AND MAINTENANCE MANUALS (CONTINUED)

B. All items listed below to be included in O&M manuals if furnished and installed by electrical contractor or his subcontractors on this project:
   1. Lighting fixtures and lighting controls.

END OF SECTION 16100

SECTION 16 20 00 ELECTRICAL MATERIALS

2.1 CONDUCTORS

A. Conductors shall be individual, insulated copper, No. 12 AWG minimum size (except for low voltage wiring and where specifically noted otherwise on the Plans). All line voltage wire to have THHN/THWN insulation. Systems wiring installed in underground conduits and wet locations to be West Penn Aquaseal.

B. All conductors No. 12 and larger shall be stranded.

C. All line voltage wire shall be rated 600 volt and all systems wire shall be rated 300 volt.

D. Wire color-code shall be as follows:

	120/208v	277/480v	120/240v
A. Phase...	Black	Brown	Black
B. Phase...	Red	Orange	Orange (3 phase)
C. Phase...	Blue	Yellow	Blue
Neutral	White	Gray	White
Ground	Green	Green	Green

E. For conductors No. 4 and larger, insulation color may be black with tape bands (colored per above) located at each end of the conductor run and at all other locations required by the NEC.

2.2 CONDUIT

A. All conduits shall be UL listed and each length shall bear the label of the National Board of Fire Underwriters.

B. Rigid steel conduit shall be hot-dipped galvanized or sherardized steel with threaded couplings.

C. IMC steel conduit shall be hot-dipped galvanized or sherardized steel with threaded couplings.

D. Non-metallic conduit shall be Type II, Schedule 40 PVC plastic, rated for 90°C and shall have wrapped rigid steel elbows.

E. Flexible conduit shall be metal and where exposed to weather shall be “Sealtite” or equal.

F. Type MC Cable with full sized ground conductor. May be only used above T-bar ceilings for wiring between j-boxes and fixtures for lighting unless otherwise noted

on the drawings. MC Cable must be concealed in all applications.

2.3 BOXES

A. Junction boxes and pull boxes shall be of the cast-metal hub type when located in normally wet locations or when surface mounted on the outside of exterior surfaces. Interior junction and pull boxes shall be built of code-gauge galvanized sheet steel. Each box shall have the volume required by the NEC for the number of conductors enclosed in the box. Junction and pull boxes shall be accessible after completion of building.

B. Concrete pull boxes and vaults shall be pre-cast. Boxes shall be set level and flush with grade (unless otherwise noted on the Drawings), and shall have concrete bases and covers. If installed in areas with vehicular access they shall be vaults with bottoms and full vehicular covers.

C. Outlet boxes shall be 4 square 11/2" deep minimum one piece galvanized or sherardized steel of a type to satisfy the conditions for each outlet. All boxes used with conduits 1” and larger shall be minimum 2” deep. Plastic boxes are not permitted.

2.4 DISCONNECT AND SAFETY SWITCHES

A. Disconnects shall be externally operable safety switches with quick-make, quick-break mechanism, capable of switching ten (10) times switch rating and with cover interlocks with defeat mechanism for maintenance. Provide switches and number of poles, amperage, voltage, HP ratings, types of enclosures and fusible or non-fusible as indicated and as required for the particular application. Switches shall be heavy duty type unless indicated. Provide NEMA-1 enclosures for indoor locations and NEMA 3R enclosures for exterior locations, unless otherwise indicated. Switches having a dual rating when used with dual element fuses shall have rating so indicated. Fuses, where required, shall be UL listed current limiting type.

B. All disconnect switches shall be equipped with devices enabling the switch to be externally locked in the open position.

2.5 IDENTIFICATION OF SWITCHES AND APPARATUS

A. All branch circuit panelboards, lighting control devices, disconnect switches, feeder breakers and main breaker on electric switchboards and all other apparatus used for control or operation of circuits, appliances and equipment, shall be identified with engraved lamicoid nameplates securely fastened in place with cadmium plated self-tapping screws.

B. Provide a lamicoid nameplate with 1/4" letters on the panel front identifying the

panel.

END OF SECTION 16200

SECTION 16 40 00 INSTALLATION METHODS

4.1 WIRING

A. All branch circuit wiring shall be done with identified (White) neutrals and color-coded phase wires. All conductors shall be continuous from outlet to outlet and no splice shall be made except within outlet or junction boxes.

B. Feeder conductors shall be continuous from equipment to equipment. Splices in feeder conductors are not permitted unless noted on the Drawings.

C. All wiring, including low voltage wiring, shall be installed in conduit, where exposed.

D. Splices made in dry locations may be made with screw on connectors for wire #6 and smaller. For wire #4 and larger splices may be made with compression sleeves and shrink tubes. All splices made in low voltage cables in underground and damp locations if allowed on drawings shall be 3M #72-N series resin encapsulated splice kits.

E. All branch circuit wire in panelboards and load centers shall be properly identified with wire markers indicating circuit numbers. All wire shall be neatly formed and fastened with clips or lacings.

F. All branch circuit wiring shall be run concealed within ceiling spaces, walls, under floors, or in crawl spaces, unless otherwise specifically noted.

4.2 CONDUIT

A. Branch circuit conduits shall be sized per the National Electrical Code for the number and size of wires shown on the drawings unless otherwise noted. Minimum size shall be 1/2” (inch).

B. Conduits run underground, in masonry walls, or under concrete slabs shall be minimum 3/4” size and shall be non-metallic (PVC).

C. Conduits exposed to the weather shall be galvanized rigid steel and any interior exposed conduits subject to physical damage shall be rigid steel to 4’ above finished floor.

D. Conduits concealed in wood or steel framed walls or ceiling spaces and exposed in interior spaces 4’ or more above finished floor shall be EMT.

E. Exterior exposed feeder conduits above grade shall be galvanized rigid steel. Interior feeder conduits not subject to physical damage and over 4’ above finished floor shall be EMT.

F. Non-metallic conduits shall have wrapped rigid steel elbows for runs over 100’.

4.2 CONDUIT (CONTINUED)

G. Wrapping for rigid steel conduit underground shall be of a corrosion-resisting protective tape covering equal to 3M Company Scotchwrap #51 tape (maximum one inch width for conduits up to and including 2” diameter). Wrapping shall be applied uniformly and tightly free of voids and wrinkles with a minimum one-half inch overlap. Field joints shall be double wrapped and wrapping shall extend at least three (3) inches over adjacent conduit coverings.

H. No electrical conduits shall be covered before inspection and approval by the Architect. Contractor shall notify Architect that conduits are ready for inspection at least 48 hours in advance of planned covering

I. Flexible conduit or MC cable with code sized ground wire shall be used for all concealed branch circuit wiring shown on the plans.

J. Exposed conduits, where permitted, and concealed conduits shall be run parallel to or at right angles with lines of buildings. Exact routing of exposed conduits shall be approved by the Architect prior to installation. Groups of conduits shall be neatly racked together.

K. Conduits shall be installed in a rigid and satisfactory manner with support spaced not more than 8' apart. Conduits under floor slabs shall be installed to outlet boxes with locknuts and by bushing or other approved devices. Conduits shall be jointed by approved conduit couplings and shall have ends butted in all cases where couplings are used. Conduit shall be tightly corked and otherwise well protected during construction, and, if necessary, blown out and swabbed before wires are pulled. Ream all conduits ends after cutting. Bends shall be made with standard conduit elbows or conduit bent to not less than same radius. All bends shall be free from dents or flattening. Conduits shall not be run in concrete slab except where passing through vertically.

L. All conduits, and all non-metallic conduits shall contain code sized copper bonding wire.

M. Where conduits rise from underground locations or from under floors or concrete slabs, they shall do so vertically. No curved portion of the riser's elbow shall protrude beyond the finished surface of the floor, slab or other finished grade surface.

N. Contractor shall provide all necessary sleeves and chases where conduits pass through floors and walls and any other necessary openings and spaces, all of which shall be arranged for in proper time to prevent unnecessary cutting. Where cutting is necessary, Contractor shall make all repairs in a manner satisfactory to the Architect.

4.3 WIRING DEVICES

A. Connections to wiring devices shall be made by either inserting the wire in the approved opening and securing by tightening of a screw, or curling the wire around the screw and tightening. Spring pressure held "snap-in" connections are not acceptable.

4.4 GROUNDING

A. Equipment, lighting fixtures and wiring devices shall be grounded through the raceway system or through a separate ground wire in a cable system. Ground pole of receptacles shall be connected to the outlet boxes by means of a No. 12 bare copper wire connecting to the screw in the back of the box, or an approved ground clamp, or by the NEC approved methods. A copper wire sized to comply with codes, shall be installed in flexible conduits and non-metallic conduits to provide a ground path through the conduit.

B. All conduit, outlet boxes, enclosures for electrical equipment, etc., shall be permanently and effectively grounded. Where it is not possible to obtain good contact otherwise, conduits shall be bonded to boxes and cabinets with No. 6 AWG or larger wire (as required by code) between a grounding bushing and a grounding lug on the box.

END OF SECTION 16400